

# Cityscape

*A Journal of Policy  
Development and Research*

FORM FOLLOWS FAMILIES:  
EVOLUTION OF U.S. AFFORDABLE  
HOUSING DESIGN AND CONSTRUCTION  
VOLUME 16, NUMBER 2 • 2014



PD&R



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U.S. Department of Housing and Urban Development  
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# Symposium

*Form Follows Families:  
Evolution of U.S. Affordable Housing  
Design and Construction*

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*Guest Editor's Introduction*

# **The Most Common of Buildings: The Design and Construction of U.S. Homes and the Households That Occupy Them**

Carlos E. Martín  
Urban Institute

During our nation's recent housing boom and the subsequent contraction, images of homes of varying size and designs, and in various stages of luxury or disrepair, littered the covers of popular magazines and newspaper articles. Any glimpse at cable television programming devoted solely to consumers' stylistic preferences would extol the latest and greatest in housing size, functional layouts, and architectural finishes. All these images have served as visual markers of their times and, in some recent cases, historical ruins.

Behind the facades and walls, however, the design and construction of housing of all types are manifestations of numerous industrial, economic, and cultural trends as much as they are symbolic of those trends. The physical structure, function, and aesthetics of homes also contribute to numerous social outcomes—not the least of which are resident well-being, household financial outlays, and social status. Indeed, the connections between our physical housing and housing's social and economic import are numerous.

Some of these associations appear obvious. For example, the renaissance of prefabrication and mechanization in home construction during the boom years responded to the difficulty of supplying housing efficiently and rapidly enough to meet the immediate demand fostered by increased mortgage access and rising home values. Other relationships between the physically tangible changes in our housing and broader social and political contexts have been evolving over time but can be measured as easily. One such case is the recent explosion of green building products and practices, which are the fruit of a growing awareness of the constraints on our physical environment—and the implications of those constraints for utility bills and occupant health—that has been steadily growing since taking root during the 1970s oil crisis.

Finally, other connections relate historical transformations in houses to broad demographic and cultural shifts. The amenities and technologies within rooms, the layouts of rooms within homes, and the physical connections between homes within neighborhoods all manifest centuries-long

notions of race, class, and gender and reflect the contemporary realities of household incomes and housing prices. In short, design and construction belie an evolution in both the demographic record of U.S. households and the importance—social, financial, and symbolic—of shelter in the American reality and imagination. Although much of the scholarly record and evidence supporting these connections is compelling, it remains unfortunately slim.

## Scholarly Perspectives: Housing Design and Construction

Several scholars have created a foundation of empirical inquiry in relation to the design and construction of the physical American built environment beyond housing. This foundation includes the work of Crawford (1996), Hayden (1997), Jackson (1994), and Jackson (1987) on the design of rural landscapes, suburban communities, and urban neighborhoods. Precious few scholars have focused on housing design, technology, and construction. Many of those few scholars connect broader psychosocial concepts with housing design's symbolic aspects (Rybczynski, 1987). Others have focused on key social, economic, and political phenomena in relation to housing design. For example, Lubove's (1963) seminal book documented how the Progressives of the turn of the 19th century carefully studied tenement house designs' effects on resident well-being. That study led to advocacy, which led to the nation's first health and construction codes for existing buildings.

Other scholars, notably architectural historians, have taken the subject of U.S. housing design and construction and its complex relationship to social and economic change further, beyond basic categorization of design styles. In particular, Wright's (1983) groundbreaking work examined the concept of model homes and home designs with regard to social orders throughout U.S. history—that is, orders defining those with and without the resources and access to occupy these homes. Wright argued that access to and use of key design qualities perpetuated class and racial orders around, and gender orders within, the home. The layout of house plans and functions and their relationship to gender roles was the subject of Hayden's (1981) similarly critical work. Archer (2005) and Isenstadt (2006) further shed light on these connections by studying suburban architectural finishes and home sizes, respectively, in relation to demographic changes. Harris (2013) provided a more recent contribution to this growing body of knowledge by focusing on the difference in the marketing of home design typologies and layouts to White and African-American households in the mid-20th century.

Historians of technology of have also explored the relationship between past home occupants and specific housing materials and methods. For example, Cavanaugh (1997) and Giedion (1941) described the evolving use of the most distinctively American housing material and method: lumber framing. Besides discussing the material's physical properties, both scholars illuminated how social and economic traits contributed to the invention and diffusion of balloon-frame construction in Chicago and the Midwest in the early 1800s. The interplay between social context and physical materials and methods in housing has become the subject of an increasing number of technological histories. Bigott (2001) examined advances in plumbing and mechanical systems that were made more affordable to working class, immigrant households in early 20th century Chicago. Cooper (1998), Ogle (1996), and Tobey (1996) each studied different technical systems—electrical, plumbing, and air-conditioning, respectively—in American homes. Laird (2003) examined the solar

energy advocacy movement, including home solar use. More recently, Wolfson (2013) explored the healthy housing movement of the 1980s. In nearly all this work, the focus was largely on the social and industrial milieu from which technological changes grew. Much of the recent work in the history and sociology of technology collectively argues that physical products and practices inscribe and are inscribed by their social contexts.

Although fewer in number, studies by social scientists—sociologists, planners, environmental psychologists, public health scholars, and economists, in particular—have focused on critical physical housing conditions. These studies have included examinations of severely distressed or inadequate housing (Bashir, 2002); criminal or legal actions related to housing conditions like *physical incivilities*, or violations of visual or maintenance norms in a community (Brown, Perkins, and Brown, 2004; Newman, 1973); the homebuilding and remodeling industry's practices (Abernathy et al., 2011); and changing consumer preferences and affordability with respect to different products and materials (Koebel, 2008).

This collective body of work differs from the historical scholarship in three key ways. First, the work tends to focus on specific techniques, designs, and conditions rather than broader technological and architectural trends. Lead-based paint, disaster mitigation techniques and resilience strategies, aging-in-place and accessibility options for the physically challenged, and energy-efficient and sustainable construction are recent examples of topics among the social scientists. Second, quantitative analysis that relies on measurable indicators and methodical data collection is more common. One consequence of the application of this rigor is that most studies tend to rely on smaller, often nonrepresentative samples such as a few buildings or occupants. Third, and most importantly, much of this work explores how specific physical characteristics cause, albeit partially, specific social or economic changes. This focus contrasts significantly with much of the historical work that focuses on how social and economic patterns yield specific physical and aesthetic products—that is, the inverse causation.

These seemingly divergent views of the relationship between housing's design and construction and housing's social and economic contexts, however, are not in conflict. The one generally accepted hypothesis is simply that a relationship does exist—that is, that the introduction, adoption, and transformation of U.S. housing designs and construction technologies are connected to housing's markets, industries, and social outcomes. Work to date has illuminated the directions of these relationships, yet the magnitude of these relationships and the broader significance of design for household outcomes is still a source of much scholarly—and, more precisely, professional—contention.

## **The Design and Construction of Subsidized Housing**

Perhaps because the social and economic outcomes of its occupants are so carefully considered, subsidized housing in the United States has become a critical recent terrain for this debate. The design, construction, and physical maintenance of U.S. low-income housing—both assisted and market-rate inventories—have seen both remarkable innovation and astounding decay during the past century. Where and when it has been designed, constructed, and maintained well, affordable housing is a vital economic and social asset (von Hoffman, 1996). Where it has not, it is a symbol of modern urban blight, a contributor to precarious living situations, and a symptom of

bureaucratic inefficiency and market disregard. Perceptions of these scenarios have contributed to the contentiousness of capital renewal and the displacement of residents, particularly in public housing (Vale, 2013, 2002, 2000). The physical condition of the new and existing housing stock occupied by low-income Americans ultimately mirrors housing policy, subsidy and development programs, market fluctuations, and many other considerations.

Analyses of low-income housing, especially publicly assisted housing, make up an evolving subset of the qualitative historical and sociological research on housing design. Much of this work has come about because of the explicit emphasis on design and construction in federal housing policies—for example, the introduction of “New Urbanist” design principles in the U.S. Department of Housing and Urban Development’s HOPE VI program for revitalizing public housing in the 1990s (Calthorpe, 2009). Scholarly reactions to the quality of design that resulted from the application of specific design criteria in assisted housing (Day, 2003; Hanlon, 2010; Sohmer and Lang, 2000) and to the critical role of community engagement (Jones, Pettus, and Pyatok, 1997) have developed in parallel to the professional debates about the practices and politics of low-income housing development.

Since the featuring of design in housing policy in the mid-1990s, a variety of documentary reviews of assisted housing projects and professional practices have also been published (Architecture for Humanity, 2012; Bell and Wakeford, 2008; Davis, 1995; Schmitz, 2005). With this professional scholarship has come a growing kit of professional tools, the organization, format, and content of which outline the unique relationships between assisted housing design and construction, professional designers and builders, and occupants. These tools include the online Affordable Housing Design Advisor, begun in the late 1990s, and Enterprise Community Partners’ multifaceted design efforts, including the Rose Architectural Fellowship and Affordable Housing Design Leadership Institute. The dialectic between practice and scholarly research in this subject area has been and will continue to be one that shapes the broader debate regarding the relationship of design and construction to individual, household, and community outcomes.

## The Symposium

It is into many of these gaps that this *Cityscape* symposium ventures. Rather than showcase current practices and products in housing design, this symposium focuses on continuing the exploration of historical and social science analyses of the form, materials, means, and methods of housing, with a particular focus on low-income housing. The articles presented here cover a wide range of relationships within this subject area.

Vinit Mukhija’s article, “The Value of Incremental Development and Design in Affordable Housing,” considers the informal design interventions that residents produce, focusing on a single design technique and housing strategy—that is, incremental housing. Mukhija specifically explores the potential of self-help housing efforts and their physical outputs regarding housing designs and construction by assessing the U.S. Department of Agriculture’s Mutual Self-Help Housing (MSHH) program. Although his article is critical of certain terms and changes in the program’s regulations, Mukhija attempts to demonstrate how programs like MSHH that circumvent formal housing production practices can expand housing supply appropriate for low-income households’ financial capacity and design functions.



To elaborate on the ways in which housing policy and design interact, the articles “What Affordable Housing Should Afford: Housing for Resilient Cities,” by Lawrence J. Vale, Shomon Shamsuddin, Annemarie Gray, and Kassie Bertumen, and “Disaster Recovery and Community Renewal: Housing Approaches,” by Mary C. Comerio, focus on a single design and policy issue as it plays out in different national contexts. Vale et al. take on a broad topic of contemporary interest in the housing design world: *resilience*. Building on Vale’s past analysis of U.S. public housing design and social policy outcomes and on his comparative international work on postdisaster housing recovery, Vale et al. argue that affordable housing should afford a variety of key social and economic benefits beyond the provision of shelter. The article puts forth four case studies in contexts ranging from a U.S. public housing redevelopment and the regularization of an informal settlement in Chile to postdisaster environments in the United States and Indonesia. In these varying contexts, resilience, defined across economic, social, physical, and governance dimensions, then becomes a simultaneous design and a policy imperative.

To further contribute an international perspective that shares the context of disaster-related housing, Comerio scans the globe for housing policies that have served to either enable or challenge the broader social and policy goals of recovery. Comerio distinguishes housing—its design, construction, and reconstruction—from other types of physical investments to demonstrate how recovery is informed as much by national and local definitions of the social contract as by the physical quality of the housing stock. As such, Comerio grounds the concept of resilience in specific, current policies (and policy gaps) that will shape and incentivize housing design and construction in the near future.

Gwendolyn Wright’s article, “Design and Affordable American Housing,” summarizes where the early architectural histories of popular housing—including her own previous groundbreaking work—leave off. Wright continues to place contemporary affordable housing design and policies in historical context. In paying particular attention to the longstanding appeal of homeownership in the United States, for example, Wright emphasizes the critical interplay between the housing demands of different demographic groups and the market forces and policies that often do not supply them. Wright’s broad survey and reflective commentary on housing design trends reengages a subject that has received scant scholarly attention despite the pressing nature of housing affordability today.

As I noted in the literature review, the scholarship on housing design’s import is often interspersed with reviews and exhibitions of actual housing designs, particularly of U.S. assisted housing. This symposium purposely seeks not to duplicate those efforts. Rather, we hope to place those efforts in context by including pieces written by either the original developers or current leaders of the most noteworthy assisted housing design practice efforts.

In “Bringing the Power of Design to Affordable Housing: The History and Evolution of the Affordable Housing Design Advisor,” Deane Evans, creator of the Affordable Housing Design Advisor, looks back on the original goals and purpose of the effort, its key challenges, and its contemporary significance. Launched in the midst of the housing boom of the early 2000s, the Design Advisor website was framed by the increasing media attention paid to housing design in market-rate housing and, more significantly, by the increasing need to preserve and expand assisted housing. Design often became the vehicle for promoting housing assistance in the midst of reductions in public

resources and increases in local market pressures and local popular resistance to assisted housing development. Housing affordability problems nonetheless persist—particularly among low-income renters. Likewise, as Evans suggests, affordable housing design's importance and opportunities remain.

As Vice President for National Design Initiatives at Enterprise Community Partners, Katie Swenson has a distinct vantage point as a current advocate for assisted housing design excellence. In “Designing Better Designers: Families First,” Swenson reviews a broad list of key outcomes that she has observed from Enterprise's design and design practice interventions, ranging from household health and building performance improvements to neighborhood transformation and community engagement. Swenson also discusses the practical challenges that the assisted housing development community faces, however, not the least of which is the necessary socialization of the profession.

A central theme emerges across Wright's broad sweep of housing design trends and Mukhija's focused assessment of a national housing policy with explicit design implications; through Vale et al.'s expanded definition of assisted housing's global aspirations and Comerio's review of contemporary housing recovery policies; and to Evans' and Swenson's presentations of design practitioners' current and future opportunities. All the articles in this symposium collectively affirm the ongoing hypothesis that housing design and construction are intrinsically and inextricably connected to household social, economic, and political contexts. Design scholars will enjoy the variety and timeliness of subjects covered in this symposium but will not be surprised by the underlying premise that design matters. To them, this symposium is a call to arms for further research on housing design that employs a variety of rigorous methods in an expanding list of topic areas. More to the point, however, I hope that housing scholars in other disciplines, whose focus has not been on the physical production and condition of housing nationally and globally, may become aware of this body of work. The subject of housing design and construction has often received short shrift in the world of housing scholarship, including from *Cityscape*. This symposium serves as a herald for potential collaboration in the future and a siren for calling much-needed attention to the scholarly subject of housing design.

## Guest Editor

Carlos E. Martín is a senior research associate at the Urban Institute.

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# The Value of Incremental Development and Design in Affordable Housing

Vinit Mukhija

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## Abstract

*This article criticizes the overwhelming emphasis in the United States on financial approaches in expanding access to homeownership, and it suggests that the focus detracts from a serious consideration of the role of design in making housing affordable. The article also suggests that modest designs that facilitate and allow for progressive expansion and improvement over time have an important role in affordable housing. Although most observers do not think of incremental development in the context of the United States, I illustrate that it is more common than the conventional wisdom suggests. I focus specifically on a U.S. Department of Agriculture-financed program of affordable housing through mutual self-help and incremental development. I show that in the past two decades the program has moved away from its initial focus on modest designs that were ideal for incremental expansion. Consequently, the initial cost of housing has increased, and the program's ability to target very low-income households has decreased. I discuss opportunities for design-based strategies in improving housing affordability, but I also caution against some emerging directions in design-based thinking.*

## Introduction

The United States has achieved enviable success in expanding access to home loan mortgages to help make homeownership affordable. In this article, however, I suggest that the overwhelming emphasis in the United States on financial innovations and approaches in expanding access to homeownership may detract from a serious consideration of the role and value of design-based strategies to make housing affordable. I suggest more specifically that modest designs that facilitate and allow for *incremental development*, or progressive expansion and improvements over time, also have an important role in making homeownership affordable. They can also help increase the supply of rental housing. I argue that incremental

development-based design and planning approaches can help reduce the initial cost of housing development, can broaden access to affordable homeownership and housing, and deserve more attention from policymakers and scholars. I also argue that more research is needed on housing layouts and designs that can be conveniently and economically expanded over time, and I caution against housing finance requirements and planning regulations or codes that make future expansion and changes to the built form difficult.

The idea of incremental development is typically associated with developing countries, where access to institutional housing finance is limited or unavailable, particularly for low-income households. Although most observers do not think of incremental development in the context of housing practices in the United States, I illustrate that it is more common than the conventional wisdom suggests. I draw from my previous research to suggest that the strategy is prevalent in informally developed colonias, or subdivisions, along the U.S.-Mexican border region (Mukhija and Monkkonen, 2007, 2006) and in informally converted garage apartments in urban areas such as Los Angeles (Mukhija, 2014). I also suggest that incremental development and the ability to expand modest housing designs were inherent features of postwar affordable suburbs like Levittown, New York, and Lakewood, California. Finally, I focus on Mutual Self-Help Housing (MSHH), a U.S. Department of Agriculture (USDA)-financed program of affordable housing through mutual self-help and incremental development. I show that in the past two decades the program has moved away from its initial focus on modest designs that were ideal for incremental expansion over time (Mukhija and Scott-Railton, 2013). As a consequence, the initial cost of housing has increased significantly, and the program's ability to target very low-income households has dropped dramatically. In spite of noteworthy financial innovations, including longer loan terms and access to secondary finance for borrowers, non-profit developers of MSHH are facing challenges in targeting their programs to their originally intended beneficiaries: modest-income farmworkers.

My article is divided into four sections. After this brief introduction, the next section elaborates on the idea and practice of incremental development. I discuss its intellectual links to affordable housing strategies in developing countries, but I also suggest its prevalence in housing improvements in U.S. suburbs and in informal initiatives in U.S. cities. The third section focuses on the main case of USDA-financed MSHH in California and shows how a key original innovation of a modestly designed house has disappeared. In the fourth section, I conclude by focusing on potential avenues for policy and research. On the one hand, I discuss opportunities for design-based strategies in improving housing affordability and, on the other, I caution against some emerging directions in design-based thinking.

## **The Idea of Incremental Development**

Conventional wisdom associates the idea of incremental development with low-income households in developing countries. Planning scholars have suggested that the incremental development approach—also known as progressive development or autoconstruction in the literature—persists because, for most low-income households, it is often the best available option, particularly in the absence of adequate government support for affordable housing

or housing finance (Abrams, 1964; Peattie, 1968; Turner, 1976, 1972, 1967; UN-Habitat, 2003). Incremental development approaches allow for the gradual development of a home as a function of funds, resources, time, and needs. As an ingenious design adaptation, households may start with a single room and gradually expand and improve their homes, wall by wall, room by room, and floor by floor. Sometimes they may even add a new housing unit and use the rent they receive to further improve their homes. Although the incremental development process of affordable housing is often called self-help housing, self-managed housing may be a more appropriate term, because the incremental development of homes typically involves labor by both residents and hired workers (Turner, 1982).

Planning scholars have also suggested that a variation on the international incremental development approach is common in the so-called *colonias*, informal subdivisions along the U.S. border region with Mexico (Donelson and Esparza, 2010; Mukhija and Monkkonen, 2006; Ward, 1999). Colonias are principally associated with Texas but are also present in the other border states (Arizona, California, and New Mexico). Since the early 1990s, they have gained planning and policy attention from state lawmakers and federal agencies, particularly USDA, the U.S. Department of Housing and Urban Development, and the U.S. Environmental Protection Agency. Perhaps the most surprising aspect of colonias in Texas is that they were developed legally. Unlike most informal land subdivisions in developing countries, they were developed in a legal and policy vacuum, and their developers took advantage of the lack of regulations.<sup>1</sup> Another important distinction is that the approach to incremental development in U.S. colonias and informal subdivisions is somewhat different from the approach in developing countries. Most low-income households that buy individual lots in colonias also typically buy a manufactured home or a modular home, which is then moved onto their property. These initial homes serve as a core for future incremental additions and extensions and for extensive do-it-yourself and self-help improvements to the interiors of the homes and the yard areas. Although the development sequence is not as stark as the classic incremental development in developing countries, particularly as practiced by squatters, the logic of the housing consolidation process is similar and incremental.

This logic of progressive expansion and improvement of a core house over time was also a key feature of U.S. postwar suburbs. The archetypal suburbs like Levittown and Lakewood have received recognition for their success in combining mass-produced and assembly-line construction with access to affordable Federal Housing Administration home mortgages, but their small, single-story houses were also central in their strategy for expanding affordability (Gans, 1967; Jackson, 1985; Waldie, 1996). These homes, with their standardized designs, were easy to produce quickly and became a malleable core for future homeowner-led additions and changes. An excellent unpublished study by the architects Robert Venturi and Denise Scott Brown (1970) noted more than 40 years ago that it was difficult to find pristine, unmodified original homes in Levittown (also see Kelly, 1993). Whereas architects and planners criticized postwar suburbs for their cookie-cutter homes and homogeneity, Venturi and Scott Brown

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<sup>1</sup> The framework for regulating land subdivisions in Texas has changed since the mid-1990s, and new subdivisions have more demanding infrastructure and land development requirements (Ward, 1999).



focused on their adaptability and pointed out that the homes had been heterogeneously expanded and modified to create a significantly more interesting and diverse built form.<sup>2</sup> D.J. Waldie (1996), in his poetic, California Book Award-winning *Holy Land*, likewise described how Lakewood's modest designs helped keep costs down and enabled working-class households to buy their homes. Many of these homes, as Waldie noted, have been slowly expanded, customized, and transformed significantly by their owners.

My current research likewise shows that incremental development approaches are common in contemporary U.S. cities (Mukhija, 2014). Many of the cases, however, are of informal additions and unregulated and unpermitted modifications that leverage easy opportunities for expansion in the built environment of housing. For example, in many single-family homes, garages provide the easiest and most economic space for expansion, and they are regularly converted without permits. The converted garages sometimes house family members and, at other times, they are rented out as relatively affordable housing. The backyards of single-family homes also offer easy opportunities for expanding homes, either as an extension of the existing house or as an additional housing unit (exhibit 1). These unpermitted additions are often driven by economic need and design opportunities, and they are not always safe. They nonetheless offer lessons to planners and policymakers on the need for affordable housing and the value of designs that allow for adding or expanding the affordable housing stock at the household level.

### Exhibit 1

#### An Unpermitted Backyard Unit in Northern California

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Source: Vinit Mukhija

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<sup>2</sup> Venturi and Scott Brown are also coauthors of the acclaimed, and similarly themed, *Learning From Las Vegas* (Venturi, Scott Brown, and Izenour, 1972), which made the provocative argument for modernist architects and planners to learn from how common people adapt, organize, and design their built environment.



## **De Facto Incremental Development in Mutual Self-Help Housing**

Although formal housing programs that incorporate incremental development are rare in the United States, the MSHH program, a USDA mortgage subsidy program, has played an important role in helping low-income households in rural areas, particularly farmworkers, own their homes. The program has produced about 46,000 homes, nearly one-third of them in California, and nearly 60 percent of them have gone to minorities (HAC, 2011, 2010, 2005). Instead of making a downpayment for their mortgage, the beneficiaries agree to contribute their sweat equity, through self-help, in cooperation with other participating households. Most households agree to 40 hours of self-help per week, for a commitment of 1,100 to 1,500 total hours of labor. The self-help groups typically average between 10 and 13 families. Some evidence also suggests that the group work helps in building social ties and community networks (HAC, 2005). Moreover, some participants move on to better paying construction jobs after the experience. Nonprofit organizations act as intermediaries between USDA and the beneficiaries. Although the MSHH program provides beneficiaries with a finished home, most of the homes, as in incremental development efforts, are substantially modified over time through room additions, expansions, and other gradual improvements.

With the help of a doctoral student, I recently examined empirical evidence from California and focused on three of the major nonprofit developers in the state (Mukhija and Scott-Railton, 2013). In addition, the research considered the Housing Assistance Council's (HAC's) national data on USDA's lending for the MSHH program. The following account is based on that research.

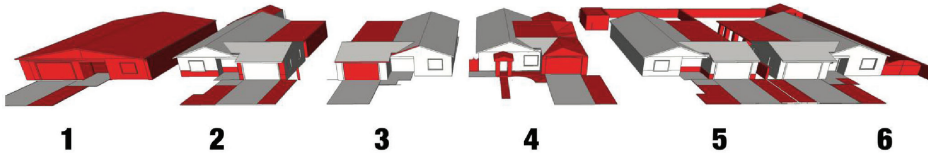
### **Modest Designs**

The MSHH program is best known for reducing construction costs through its use of self-help labor and USDA's subsidized financing. A less discussed but key component of the first three decades of the MSHH program was the simple and modest design of the homes. These homes were initially designed with approximately 1,000 square feet in area, and the program rules classified them as "modest" houses. They were typically built with less expensive materials and with simple designs and construction techniques that enabled the developers to maximize the use of self-help labor from beneficiaries. For example, in addition to their modest sizes, the houses had basic floor plans with simple rooflines and a very limited use of architectural ornamentation. They were utilitarian in quality and met the basic needs of their occupants.

Our field visits and analyses showed that these modest MSHH homes rarely stayed as they were initially built. The original modest homes usually became cores around which the owners expanded and on which they elaborated by adding architectural and ornamental details. Exhibit 2 shows a diagrammatic illustration of our analysis of a typical MSHH project built by a nonprofit housing developer in the late 1980s. As exhibit 2 indicates, nearly all the houses show some improvements, changes, and expansions. Home 1 had the most significant rebuilding, but homes 2, 4, and 5 also had substantial changes and expansions. The typical spatial, or floor area,

## Exhibit 2

### Self-Help Homes, Decades Later



Six neighboring homes developed by a nonprofit housing developer in California in the late 1980s. The bottom image shows present-day aerial imagery. The top image shows a three-dimensional model analyzing the incremental changes; features in white and gray represent the original homes, and features in red represent post-occupancy modifications made by the owners. Sources: Top—Mukhija and Scott-Railton (2013); bottom—Google Maps

modifications include extensive additions and covered or dried-in patios and garages. Furthermore, in several homes, owners expanded the uncovered parking spaces and, in many homes, owners made landscaping and street elevation improvements, including flowerbeds and trees, attractive roof tiles, decorative entranceways, and ornamental exterior lighting.

### The Gradually Disappearing Modest House

Although the small size and simple designs of the modest houses were pivotal in helping to keep the construction costs down, USDA agreed to relax this program requirement. By the early 1990s, USDA removed its rigid templates for garage size, floor plan, and exterior ornamentation. Instead, it agreed to a revised stipulation that homes be relatively modest for the locations in which they were built. USDA's amendments were in response to requests for flexibility from the nonprofit housing developers. The nonprofit organizations were facing pressure for more elaborate homes from both their beneficiaries—who sometimes wanted larger homes, particularly homes with more than a single-car garage—and local governments, who thought that the MSHH homes were too modest and potentially lowered the property values of neighboring homes.

New two-car garages consequently have become the development norm in California's MSHH homes. To appeal to local governments, whose support is needed for securing housing permits and approvals, these homes also have elaborately articulated facades. Tiled roofs, articulated gables, and waist-height stone veneers have become common in street elevations,

and it is often difficult to distinguish between a nonprofit developer-built MSHH project and adjoining market-rate housing built by a for-profit developer. Although the number of bedrooms offered in homes has not necessarily increased, the spatial size of homes has increased significantly. To illustrate, in the early 1990s, three-bedroom MSHH homes were likely to be about 1,000 square feet with a one-car garage of about 300 square feet. More contemporary three-bedroom MSHH houses, however, are likely to have a floor area of about 1,200 square feet and a two-car garage of nearly 500 square feet.

### **Higher Costs, Bigger Loans, and Fewer Low-Income Beneficiaries**

The cost of developing MSHH homes inevitably has increased because of their larger size and more elaborate design and construction. Moreover, the more specialized construction activities that are beyond the skills of the typical households contributing their self-help labor create an additional need for outside labor, which further adds to development costs. Although USDA has increased the available loan amounts, nonprofit developers have to find secondary financing, which bridges the gap between the primary loan and the total cost of construction. Creatively securing adequate secondary financing, and sometimes even tertiary financing, from private and public sources has become a major task for the nonprofit developers. National-level data from HAC also suggest that costs and loan amounts within the MSHH program have increased throughout the country.

Lower interest rates fortunately have helped make larger loans affordable to beneficiaries. To increase access to the home loans, the regular loan duration has been extended to 33 years. For very low-income households, loan periods can be extended to 38 years. Notwithstanding these admirable financial innovations, the number of very low-income households in MSHH projects has dropped because of the higher cost of housing. According to HAC, the drop in participation by very low-income households in MSHH programs is a nationwide trend. It is now common for MSHH projects, particularly in California and other more expensive land markets, to house the minimum percentage of very low-income families mandated by USDA (HAC, 2010). The quality and size of MSHH homes have improved and increased, but that appears to have created a troubling tradeoff in affordability, with fewer low-income households qualifying for homeownership through the program.

## **Conclusion**

Although I have criticized the MSHH program for its increasing difficulties in targeting very low-income households, it is important to frame this criticism in the context of the program's significant success in helping low-income households, particularly from minority groups, achieve their dream of homeownership through subsidies and collective self-help. The United States has very few comparable housing programs. I am, nonetheless, concerned about the program's departure from its modest home designs of about 1,000 square feet, which helped decrease the initial cost of housing but allowed for de facto incremental development and improvements. The MSHH program has tried to maintain access to homeownership for low-income households through financial innovations, but these improvements may have reached

their limits and may have prevented program administrators from returning to the original modest home designs as an affordable housing strategy. Drawing from the MSHH experience, and from postwar suburbs and informal home improvements in contemporary U.S. cities, I suggest that incremental development-based design and planning approaches deserve more attention from policymakers and scholars interested in affordable housing. Incremental development approaches can help decrease the cost of homeownership and increase the supply of affordable rental housing.

Planners and policymakers need to better integrate design-based thinking in housing policy. One seemingly design-based approach for increasing affordability is the growing popularity of so-called microapartments. These amenity-rich microapartments, however, are rarely affordable. They may, nonetheless, play an important role in the housing market by increasing the diversity of available housing options. Design-based thinking in affordable housing, however, should not simply imply shrinking the size of homes. For example, in the early MSHH projects, the original modest houses also had designs and layouts that were easily expanded and incrementally improved through simple additions and modifications. It is particularly important in such projects that lot sizes do not shrink significantly but retain their potential to support future additions and expansions. Thus, I recommend more policy-oriented, design-based research on housing form, particularly research that assesses housing models and typologies that owners and users can easily and economically expand. In addition to studying ground-oriented single-family homes, scholars should also examine how housing can be gradually improved in taller built forms.

Finally, for incremental development to be viable, the associated institutions of housing finance, property rights, and land use regulations also have to support the possibility of flexibility and changes in the built form of housing. In particular, I do not want to minimize the likely challenges and opposition to incremental development and modest housing from communities and municipalities. This issue has been key in the MSHH experience. Planning institutions need to find better ways to address such NIMBYism (not-in-my-backyard ideology), however, than forcing affordable housing developers to build housing that is indistinguishable from surrounding properties. For example, opportunities may exist to creatively structure and support incremental changes to the built form by providing access to financing and design assistance. Without such enabling support, higher standards will proportionately add to the cost of constructing affordable housing and make it difficult for property owners to incrementally expand their housing. They will either push out affordable housing or leave homeowners with no other option but to informally make unpermitted additions.

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# What Affordable Housing Should Afford: Housing for Resilient Cities

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## Abstract

*Well-designed affordable housing involves more than the provision of safe, decent, and inexpensive shelter; it needs to be central to the resilience of cities. Framing the issue as a matter of “what affordable housing should afford” expands the agenda for housing designers to consider factors that extend beyond the physical boundaries of buildings and engage the social, economic, environmental, and political relationships that connect housing to cities. To maximize its capacity to support the resilience of cities, affordable housing should engage as many as possible of the following four criteria: (1) support the community social structure and economic livelihoods of residents, (2) reduce the vulnerability of residents to environmental risks and stresses, (3) enhance the personal security of residents in the face of violence or threats of displacement, and (4) empower communities through enhanced capacities to share in their own governance. We illustrate these principles with four examples from recent practice—two illustrating the struggle for everyday affordable housing (in San Francisco and in Iquique, Chile) and two describing the special circumstances that result in the aftermath of disaster (in New Orleans and in Banda Aceh, Indonesia). Taken together, these examples demonstrate what is at stake if we ask affordable housing design to serve the greater goal of city resilience.*

## Introduction: Linking Affordable Housing to Resilient Cities

The concepts *affordable housing* and *resilient cities* have each attained widespread use in recent years, but their very ubiquity has increasingly moved researchers and practitioners away from consensus



about the meaning of either term. Mentions of affordable housing quickly trigger questions: Affordable for whom? Affordable for how long? What is affordable? Is paying 30 percent of income really an appropriate threshold for defining affordability for everyone, regardless of their income? Questions of politics, policy, and design also apply: Who should be responsible for providing affordable housing—the government, private sector, or nonprofit organizations? How does affordable housing remain affordable? Should affordable housing look the same as market-rate housing—except that residents receive subsidies—or should it be designed, sited, and built differently?

The invocation of resilience raises similar questions about meaning, intent, and application and risks becoming at least as imprecise as “sustainability” has become. Resilience for whom? Against what? Resilience for how long and to what end? Does resilience connote the engineer’s notion of bouncing back to equilibrium after a perturbation or does it reflect the ecologist’s concern that ecosystem disruption creates dynamic change and may lead to a nonequilibrium outcome? Is resilience instead characterized by the capacity of management to return to business as usual, or rooted in the psychologist’s assessment about individual recovery from trauma, or revealed by the homeland security professional’s interest in the capacities of networks to resist disruption? It can be all these things and more.

The concept of resilience is increasingly used to describe how well urban areas do or do not respond to crises. Prominent organizations, including international aid agencies and major philanthropic foundations, have popularized the idea of urban resilience and promoted the view that resilience is a condition that cities can aspire to reach.<sup>1</sup> The notion of a resilient city, however, generates questions about who or what counts as part of the city—are whole cities resilient, or merely some parts, some places, some institutions, or some individuals? Given this ambiguity of terminology, the problem may appear to be compounded by proposing to engage affordable housing and resilient cities together. Instead, we argue, using each term to help focus and clarify the meaning of the other offers a way out of this dilemma.

Linking affordable housing to resilient cities forces engagement with these ambiguities and offers an opportunity to sharpen operational definitions. Acknowledging that affordable housing is a major issue in many cities for people across an increasing range of incomes, this article is centrally concerned with what affordable housing affords a city’s low-income residents, however such poverty may be measured locally. The article assesses resilience, in turn, in relation to the housing needs of a city’s residents in two forms: (1) on an everyday basis, and (2) in the acute form that arises in the aftermath of a sudden disaster. In both contexts, housing becomes an important part of daily life, not only because of its cost, but also because of the access that housing can afford to other attributes of a viable urban life. Specifically, housing can help residents address the struggle to maintain economic livelihood, the threats of a changing climate, the challenges of urban violence, and the inequities of governance. In this way, the affordability of housing is inextricably connected to the resilience of cities.

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<sup>1</sup> For example, The Rockefeller Foundation initiated the “100 Resilient Cities Centennial Challenge” in 2013 to support cities in dealing with the “increasing shocks and stresses of the 21st century” (<http://100resilientcities.rockefellerfoundation.org/pages/about-the-challenge>). The United Nations Office for Disaster Risk Reduction launched the “Making Cities Resilient: My City is Getting Ready!” program to address “issues of local governance and urban risk” (<http://www.unisdr.org/campaign/resilientcities/about>).



By framing the issue as a matter of “what affordable housing should afford,” we are seeking to expand the agenda for housing designers. Although it is certainly true that many greater social and economic questions entail separate programs that may take place “off site,” out of site should not mean out of mind. Basic decisions about architectural programming and key details of site arrangement can vitally affect the capacity of affordable housing to serve its residents fully and effectively. It is well within the realm of design to keep asking: Design for what purposes? At base, well-designed affordable housing has more to deliver than financial affordability. It should be understood as central to the resilience of cities. Cities as a whole, by the same token, cannot demonstrate the capacity for resilience unless this resilience is rooted in the successful provision of affordable housing to the least advantaged residents. This equity mandate is the link that connects the ideas of affordable housing and resilient cities, which is why we argue that affordable housing must be created in service of resilient cities.

## **Housing and Critical Resilience**

If designing affordable housing for resilient cities is the goal, then it becomes possible to set criteria and seek out exemplars of promising practice. Ideal designs or policies would contribute to traditional conceptions of resilience by making communities better equipped to withstand climate change, security threats, and other disasters, and they would also address overlooked aspects of resilience by making communities more energy efficient, environmentally sensitive, broadly affordable, well managed, socially connected, and physically attractive. It is unreasonable to expect every example to accomplish all these goals simultaneously, but it ought to be the ambition of affordable housing design and designers to contribute to as many of these dimensions as possible. Unless these greater goals are established as central to what it means to design well and effectively, however, they may be treated as secondary to the aesthetic appearance of the housing or falsely seen as outside the purview of a designer’s concerns.

The Massachusetts Institute of Technology’s newly launched Resilient Cities Housing Initiative (RCHI—pronounced “Archie”) is intended to operationalize this quest by drawing attention to a global array of projects and programs that demonstrate ways that housing (broadly considered) can be a positive force for the resilience of cities. To do so, RCHI examines completed residential housing developments and also plans, policies, and programs for housing and housing-related needs. For RCHI, the resilience of cities refers to the capacity of urban areas to adjust and adapt to sudden shocks and longer term disruptions in ways that support and promote the well-being of all residents, particularly the least advantaged. Resilience is understood to be a capability that urban areas exhibit to differing degrees in response to various challenges, as opposed to a fixed condition or state. Shocks and disruptions can take the form of natural disasters, including earthquakes and hurricanes; increasing environmental threats posed by a changing climate; financial downturns, including economic recessions and the loss of local industries or major employers; and political upheaval, including revolutions and wars. In such contexts, the engineer’s conception of resilience as “bounceback” is not sufficient, and it can even be misleading. An equity-driven view of urban adaptation insists that cities cannot demonstrate resilience by channeling new investment aimed at the return to some predisruption status quo rooted in the marginalization of low-income groups.

Instead, adjusting to external shocks entails a process of developing a more inclusive society that provides social, economic, and political support for the most vulnerable populations. Indeed, one key measure of resilience is how well low-income groups fare before, during, and after shocks.

The rationale for establishing equity as a core principle of resilience extends beyond the moral appeal of addressing the needs of disadvantaged populations. Low-income groups are often the most vulnerable to socioeconomic, environmental, and political shocks because they are less likely to have a financial safety net to protect themselves from such threats. The aftermath of disasters usually compounds preexisting inequality, which can lead to the economic dislocation and social isolation of residents and, in turn, generate additional neighborhood disinvestment and urban decline. Because of their precarious financial situation, low-income communities can be more expensive for society to reconstruct; therefore, for economic reasons, it is important to ensure that resilience includes marginalized groups. From a political standpoint, the lack of participation, representation, and civic engagement of low-income groups undermines a central tenet of a well-functioning democracy, so equity must be part of a resilience agenda to encourage social cohesion and effective governance. In these ways, the resilience of cities depends on promoting the well-being of disadvantaged populations. In focusing on improving conditions for disadvantaged groups, we adopt an approach that may be called *critical resilience*. Critical resilience entails a willingness to seek ways to “bounce forward,” not merely bounce back (Davoudi, 2012).

Applied to affordable housing for the poorest residents, a critical resilience lens suggests an important distinction between resilient housing and housing for resilient cities. These terms, which perhaps sound similar, carry quite different implications for residents and their connection to society. A notion of *resilient housing* can be entirely internalized to a work of architecture and focused on tectonics and structure, whereas *housing for resilient cities* forces the designer’s attention into larger urban realms. For example, the design of a disaster-resistant residential building could result in a heavily fortified bunker that is completely sealed off and impervious to the elements, thereby affording significant protection to occupants from the immediate effects of hurricanes, floods, and earthquakes. Although the building’s rigid structure may better withstand natural disasters, its inflexibility may prevent it from adjusting to changing environmental conditions and threats. In addition, the form of the building may isolate occupants from social networks and relationships with other urban residents. Of even greater consequence, perhaps, decisions that are driven primarily by a view of resilience premised on hardening buildings against future threat may easily tip into decisions that alter existing land uses in ways that harm the livelihoods of low-income residents. After the Asian tsunami of December 2004, for instance, governments in Sri Lanka and elsewhere opportunistically sought to use the destruction to replace flimsy shacks occupied by fishermen with more sturdily built luxury hotels constructed out of concrete (Klein, 2007). Their goal was resilient housing that could accommodate wealthy tourists, rather than housing that could support a low-income community as part of a more resilient city.

Although it is certainly important that affordable housing be architecturally resilient in the sense that it enhances the bodily safety of its residents, bodily safety is hardly sufficient. It stops well short of meeting the greater agenda of housing for resilient cities. To address this broader mission, housing must be conceptualized more holistically as a way to help low-income residents cope with four simultaneous challenges: (1) the persistence of economic struggle, (2) the dangerous vagaries

of a changing climate, (3) the impacts of urban violence, and (4) the scourges of dysfunctional governance. Housing for resilient cities is housing that provides a foundation for vulnerable groups to develop positive social relationships and economic livelihoods while reducing risks. This goal might be advanced by siting affordable housing in locations that provide ready access to educational and employment opportunities or by incorporating these opportunities into the housing project. Housing for resilient cities is housing that affords residents connections to social systems and resources, which in turn enhances the broader community's capacity for resilience. In addition, it is often housing that supports and encourages social inclusion and cohesion by bringing together people from different racial and economic groups.

## **A Framework To Analyze Housing for Resilient Cities**

RCHI seeks to develop and disseminate a broader framework for understanding resilient cities by developing a repertoire of exemplary practices that can clarify the relationship between affordable housing and resilient cities.<sup>2</sup> This process entails looking at both the everyday challenges of providing stable housing that fosters healthy lives and remains affordable to low-income residents and at ways to cope with immediate and longer term housing needs after sudden disaster, including the need for shelter and personal safety. Housing solutions that support the resilience of cities can be found in a variety of market conditions, ranging from rapid growth and urbanization to abandonment and decline. Affordable housing that affords opportunities to enhance the resilience of cities can be located both in the United States and all over the world. Whether low-income households face everyday struggles or emergency problems, and whether they cope with the pressures of increasing urbanization or the disinvestment associated with urban shrinkage, affordable housing can support resilient cities. To do so, affordable housing design needs to encompass a broader view of what design affords. To maximize the capacity of affordable housing to support the resilience of cities, its advocates must ask it to engage as many as possible of the following four criteria (exhibit 1).

1. Support the community social structure and economic livelihoods of residents.
2. Reduce the vulnerability of residents to environmental risks and stresses.
3. Enhance the personal security of residents in the face of violence or threats of displacement.
4. Empower communities through enhanced capacity to share in their own governance.

We consider each of these criteria as a way to broaden the definition of what ought to constitute good design, and we seek to document the ways that collaborative planning processes can contribute to this larger set of contextual outcomes.

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<sup>2</sup> For details about RCHI-sponsored lectures and symposia, see <http://rchi.mit.edu>.

**Exhibit 1**

**Elements of Affordable Housing for Resilient Cities**



Source: Authors

This intent to treat the design of affordable housing as encompassing far more than buildings is consistent with many emergent and contemporary practices. This embrace of larger scales and more integrative approaches is the difference between Leadership in Energy & Environmental Design (LEED)-accredited buildings and the broader notion of LEED for Neighborhood Development (LEED-ND). It is also the difference between the U.S. Department of Housing and Urban Development’s (HUD’s) HOPE VI (Housing Opportunities for People Everywhere) approach to public housing redevelopment, focused chiefly on the land controlled by a public housing authority, and HUD’s more all-encompassing community development of the Choice Neighborhoods initiative. The goal of affordable housing for resilient cities is likewise consonant in spirit with the National Low Income Housing Coalition’s notion of Housing Plus Services and the Urban Institute’s concept of Housing Opportunities and Services Together, or HOST, which asks, “Can public housing be a platform for change?”<sup>3</sup>

## “Affordances” by Design

Before moving on to consider how housing design may be extended into the realms of economic, social, and political life, it is worth pausing to consider some of the ways that design operates. At one very important level, affordable housing design is about the aesthetics of the residential living environment, which has many dimensions. Design plays an important and immediate role in the appearance of affordable housing, which can influence how low-income areas and their residents are perceived by neighbors and by the broader public. Designers of early U.S. public

<sup>3</sup> See <http://nlihc.org/issues/other/hps> and <http://www.urban.org/url.cfm?ID=412965&renderforprint=1>.

housing deliberately conceptualized it using modernist design and site planning so that it would look as different as possible from the rickety coldwater flats and narrow streets of the slums it replaced. New Urbanist alternatives to public housing similarly (if ironically) have emphasized the difference between the neotraditional urbanism of street-fronting townhomes and the discredited modernist towerblocks and superblocks of the earlier model. In the United States, affordable housing is increasingly designed to look like market-rate housing (especially if it is intended to attract a mix of incomes); this practice ostensibly helps avoid the stigma that low-income residents are different and do not belong (Vale, 2013, 2005).

The aesthetics of housing design are also tightly bound up with questions of *programming*. Programming entails important decisions about the mix of unit types, which in turn markedly affects who becomes the intended residential constituency. In a mixed-income setting, housing design can ensure that individual units are similar in terms of materials, quality, and size for all income levels and also can provide multiple-bedroom units for larger families. Housing each income group in a distinct manner or location, on the other hand, can signal differences between people that might not otherwise be so apparent. When projects seamlessly provide a spectrum of affordability, they sometimes can accommodate changing economic circumstances and minimize the social dislocation, homelessness, and social disorder that can arise from economic shocks. Multifamily housing design can also engage local artists in ways that capitalize on site-specific attributes and remain attentive to the ethnic traditions of likely residents. Programming also determines the nature and extent of nonresidential uses, and these sorts of facilities often have a great effect on the overall social and economic character of the neighborhood. Site planning and programming can also express design intentions related to civic engagement and participation. Projects can be designed to engage, enhance, and interact with the surrounding urban context, for example, by reintroducing the street grid or establishing strong street frontage, including ground-floor community centers, retail, or other public uses. The urbanistic goal of such multifamily housing is to maximize connectivity and openness, consistent with the need to also maintain security. This need to achieve a balance between community and privacy, while cultivating a layered sense of semiprivate and semipublic territories that mediate between the fully private and fully public, have been hallmarks of good design for a long time (Chermayeff and Alexander, 1965; Newman, 1972).

As implied by the issues of mixed-use site planning and public-private relations, design decisions can contribute in multiple ways that may prove valuable to low-income residents. How might design make it more likely that people will get jobs? How can design reduce the vulnerability of low-income households to the effects of climate change? How can it promote healthy lifestyles, enhance security, or enhance the probability of community engagement? At every turn, design decisions in particular places have made each of these outcomes somewhat more likely or—all too often—somewhat less so. In the rush to avoid the usual charges of environmental determinism, it is also vital to avoid making the opposite mistake. We should not overlook the power of design decisions. They may not be determinative of behavioral choices, but neither are they irrelevant. Some design decisions do make certain behavioral options more—or less—likely.

Urban design scholar Jon Lang usefully adapted the notion of *affordance* from psychologist James Gibson to help designers conceptualize “the link between the built environment, human behavior, and values and needs fulfillment” (Lang, 1994: 165). Applied to housing, this term suggests that

housing environments—especially if broadly considered—are connective spaces that link residents to broader sets of opportunities or, if poorly designed, act to restrict them. As Lang (1994: 165) put it, “Any pattern of the built world affords certain activities or aesthetic interpretations. These patterns enlarge or constrain our options for behaviors—physical and mental—depending on the overall conditions and properties of the layout of the built environment.”

Designing affordable housing for resilient cities goes well beyond architectural design and site planning, and entails broader engagement with—

- Neighborhood design and context.
- Institutional programming.
- Environment and infrastructure systems.
- Long-term affordability.
- Neighborhood security.
- Livelihood support and services.
- Social organization and community.
- Transportation networks and accessibility.

In what follows, we set out four examples that illustrate how affordable housing can be marshaled in support of a broader approach to resilient cities. We do not claim that these examples represent wholly successful achievements, but they do raise the bar for what ought to be considered possible. Each reveals that design and planning are not about one-off proposals that are either implemented or not. Instead, each case reveals the complexity of the contested and negotiated struggle that necessarily results from undertaking an ambitious agenda. From public housing redevelopment in Northern California to incremental low-income housing construction in northern Chile, we can see how affordable housing design affords many other things. From neighborhood recovery in post-Hurricane Katrina New Orleans to the challenges of the post-tsunami devastation affecting Banda Aceh in Indonesia, it becomes possible to situate housing in the realm of greater human needs and aspirations. These four examples—two illustrating the struggle for everyday affordable housing and two describing the special circumstances that result in the aftermath of disaster—demonstrate what is at stake if we ask affordable housing design to serve the greater goal of city resilience.

## **North Beach Place: Maximizing What HOPE VI Affords**

San Francisco’s North Beach Place, a HOPE VI mixed-use and mixed-income redevelopment project that opened in 2005, began life in 1952 as a 229-unit public housing development. This development, in turn, had replaced a low-income industrial and residential area in a predominantly Italian neighborhood near Fisherman’s Wharf, a neighborhood that had been devastated by the earthquake and fires of 1906. A development initially occupied overwhelmingly by White residents (which led to a landmark racial discrimination suit in the 1950s), North Beach public housing gradually became highly diverse, with substantial African-American and Chinese populations.

Given that this housing development had been located on either side of the terminus of a major cable car line, huge numbers of tourists attempting to reach Fisherman's Wharf found themselves, by the 1980s, disembarking in a dangerous and crime-ridden project uneasily located just across the street from several upscale hotels.

Rather than join in the frenzy of high-end, market-rate development sweeping San Francisco (and sweeping out its lowest income citizens), the city's strong nonprofit housing community—joined by empowered tenant groups and supported by then-Mayor Willie Brown, who wanted to see the stigma of the project removed—embarked on a public housing redevelopment effort that would preserve and enhance the last remnants of affordable housing in an otherwise gentrifying neighborhood. Developed as a public-private partnership that included nonprofit BRIDGE Housing and the for-profit John Stewart Company and Em Johnson Interest Inc., the San Francisco Housing Authority (SFHA) engaged in a highly unusual variant of HOPE VI. The development process unleashed by the HOPE VI grant not only replaced all 229 low-income public housing units on site, it also added 112 additional affordable housing units (by leveraging low-income housing tax credits, or LIHTC), a new supermarket, additional below-grade parking, and new street-level retail (exhibit 2).

Viewed holistically, North Beach Place affords its residents far more than low-rent housing; it affords them access to a thriving neighborhood with abundant jobs. This housing makes San Francisco more resilient, because it enables the city's economy to retain more of its low-income workforce. As housing, the redevelopment preserves 229 apartments with the kind of deep subsidies that make them available and affordable to public housing residents with extremely low incomes (which averaged only 17 percent of Area Median Income, or AMI, when the HOPE VI venture was launched). It also adds markedly to the overall affordability of an otherwise gentrified area through the inclusion of the LIHTC funds to create the 112 extra onsite units intended to be affordable to those working households earning approximately 50 percent of AMI.

## **Exhibit 2**

### **Exterior View of North Beach Place, San Francisco, California**



*Source: Lawrence J. Vale*



North Beach Place, importantly and by design, does more than provide better housing for low-income residents. By contrast with many other income-mixing efforts that seek to remove low-income residents from newly desirable areas of cities, this effort is an exercise in building the resilience of cities in ways that benefit *all* inhabitants, rather than only those who are most economically attractive to developers. Approximately 36 percent of the original tenant households returned after redevelopment (not an obviously impressive figure, but about twice the HOPE VI program norm), but many others preferred to retain their housing vouchers for use elsewhere in the city or region, and others shifted to housing projects for seniors. Some erstwhile tenant leaders evinced resentment about the difficulty of returning, but no one could deny the importance of having retained every single one of the original North Beach public housing units for low-income occupancy while also increasing the number of three- and four-bedroom apartments available at the development. At a time when the premise of most HOPE VI redevelopment efforts was reducing the number of public housing units and displacing many residents, the proponents of North Beach Place, prodded by residents, remained committed to serving the city's least economically advantaged. This dedication to the underserved, reflecting a capacity to develop policy based on community engagement, highlights the basic equity component of housing for resilient cities. Returning North Beach's public housing to desirable occupancy by those with the lowest incomes makes San Francisco more resilient because the least advantaged are the ones most affected by shocks, which can have ripple effects on the rest of the population.

The design of North Beach Place affords its residents (and its neighbors) important aspects of each of the four resilient city criteria we have outlined: support for socioeconomic livelihoods; reduction of environmental risk; enhancement of personal security; and creation of new opportunities for community empowerment. To be sure, some fulfillment of these criteria has remained more in the realm of aspiration than achievement, but the latter is not possible without the former.

In terms of livelihood enhancement, the HOPE VI application promised a strategy that would provide "every resident... the opportunity to achieve self-sufficiency through education, employment and entrepreneurship" (SFHA, 1996: E-23). The team proposed a variety of childcare, education, and job training programs and—in keeping with the favored HUD terminology of the day—called for a "Campus of Learners" focused on classroom space devoted to improved computer literacy and job readiness (SFHA, 1996: 23–32). It would be an exaggeration to say that all these programs have been fully realized or consistently funded, but they have certainly made some notable progress for some residents. More successful than the bold but elusive promises about self-sufficiency, the provision of street-level retail has provided a substantial revenue stream to support services for North Beach Place tenants—even though it has never yielded the once-envisioned opportunities for resident-owned business incubator space. The basic decision to reinvent North Beach Place as a mixed-use residential and retail environment likewise provided residents, neighbors, and visitors not only convenient access to another supermarket, but also access to a variety of new jobs, even including a few training and employment opportunities in the construction industry.

In terms of reducing environmental risk, the new construction of North Beach Place, by complying with the latest seismic standards, affords its residents a much greater degree of earthquake protection in a place where earthquakes are a significant issue. As the initial HOPE VI application framed it, "The seismic safety of North Beach is a major concern," noting it that it "sits on bay mud



deposits, similar to the unstable soil in the San Francisco Marina District which saw devastation in the 1989 Loma Prieta earthquake” (SFHA, 1996: B-5). Living in the old project also carried risks of exposure to “high levels” of lead paint and friable asbestos, and residents suffered from deteriorated sanitary distribution lines and a nonfunctional site drainage system (SFHA, 1996: N-3), which the new construction has solved. North Beach Place is far enough inland to be at relatively low risk for flood damage,<sup>4</sup> but the design concept of raising most of the residential portion of the development onto a plinth above a ground-floor level of surface parking represents a plausible protective strategy for more flood-prone site conditions elsewhere. The plinth served several resilience-enhancing design purposes simultaneously: it permitted inclusion of the supermarket and the off-street parking needed to support it, artfully met the pragmatic need to turn the constraint of a hillside topography into an opportunity, and offered multiple ways to enhance security.

Security—for residents, for neighbors, and for visitors—is an important part of the extended mandate of high-quality design of affordable housing. When the SFHA applied for HOPE VI funds, they described “the biggest barrier to integrating North Beach into the neighborhood” as the “lack of safety resulting from its obsolete design” (SFHA, 1996: A-1). As an alternative, proponents envisioned—and then delivered—a new design that created “defensible space in the tradition of Oscar Newman,” specifically addressing the problems that make it “‘unpoliceable’ according to the San Francisco Police Department and Project SAFE” (SFHA, 1996: A-1). Before redevelopment, the SFHA noted that “the open air corridors, unprotected courtyards, open parking lots and unenclosed stairways invite purse snatchers, muggers, car thieves and drug dealers who run through the development, terrorizing tourists and residents alike” (SFHA, 1996: B-6). SFHA described a place that the police could not secure because “there are too many places to run and hide” (SFHA, 1996: B-6). Instead, the HOPE VI team promised to improve security for both residents and visitors.

Some of this security comes from the informal resident surveillance of semipublic and semiprivate space immediately outside apartments, aided by entrances facing both the street and landscaped courtyards (exhibit 3). Security is also a matter of ongoing investment, however. The John Stewart Company, which served as codeveloper of North Beach Place and remains its site manager, spends \$25,000 per month on security, much of it connected to the operations of 39 cameras (Stewart, 2013). Although direct, street-level entries to apartments are on three sides of each block, most access to the complex is through gated portals leading to a semiprivate entry zone providing access onto the courtyard plinth. As Stewart described it,

What we really have is an entry barrier from the street. And I think a good entry design, because it doesn’t look Orwellian, even though there’s a camera there. Then we have the entry to the building and the entry to the apartment. You’ve got three barriers before somebody gets into your unit. (Stewart, 2013)

Interviews with more than 25 past and present residents, however, yield a much more mixed interpretation of the cameras. Residents frequently regard the ones in the courtyard as intrusive, an extension of rule enforcement that families with young children find to be particularly onerous and incompatible with children’s play. As designed space, they view the courtyards as planted for

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<sup>4</sup> See <http://www.sfgsa.org/Modules/ShowDocument.aspx?documentid=1783>.

### Exhibit 3

#### North Beach Place Courtyard, San Francisco, California

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Source: Lawrence J. Vale

display rather than use, especially given the prohibition on activities such as barbecuing, ball playing (even with soft NERF® balls), and bicycling. The same basic design decision that generated a relatively secure gated perimeter also yielded interior space that is acoustically problematic; all sights and sounds are shared. This version of the Jacobsian ideal—“eyes on the court”—seems a mixed blessing at best. Still, it remains the case that the new North Beach Place is, and is perceived to be, much safer than its predecessor. Although many residents understandably chafe at a perceived excess of rules or surveillance, the development has been designed deliberately to maximize the contrast with the pre-HOPE VI, free-to-all access that made the North Beach project such an easy and tempting escape route for the muggers who preyed on tourists waiting for cable cars adjacent to the development. As one resident succinctly put it, “Right now, it’s safer, but is less free for people; everything has its yin-yang” (North Beach resident interviews, 2009–2013).

For the street-level apartment entrances, Stewart observed that the designers and developers took a gamble, because those same four-bedroom units also had an entry from the interior patio one level up. “It’s always been true that if somebody wanted to they could open their door and let a person in and they could get up into the interior” (Stewart, 2013). The management, presumably with little choice, decided to trust the residents: “We’ll just have to rely on the people to be defensive themselves. And we have not had a problem there with people streaming in” (Stewart, 2013).

This view from management evinces an underlying ambivalence, even a lingering paternalism, something also noted by many residents. For their part, many Chinese residents remain mistrustful of African-American youth who loiter outside the development; one interviewee commented that her family will not even use the street-facing front door; they prefer to enter through the gate and courtyard. As one final design item that was instead really about community security, the team decided to outfit each family's apartment with an expensive stacked washer-drier. In surveys conducted before redevelopment, residents demonstrated that their biggest concern in public housing had been personal security, so they greatly appreciated not having to bring money to a communal laundry room (Stewart, 2013). In interviews conducted after redevelopment, residents confirmed that they very much appreciate this convenience.

Resident activism, aided immeasurably by multiple community organizations and legal assistance teams, yielded many victories, although the residents' struggle was long and hard fought, and their victories no more than partial. The residents and their allies notably obtained the guarantee of one-for-one onsite replacement of 229 deeply subsidized housing units, but they did not get everything they wanted. They had sought (and initially had been promised) a multiphase construction process that would have enabled many of them to remain on site without the need for temporary relocation. Some residents unsuccessfully lobbied against having the additional tier of tax-credit units added to the site plan, arguing that the development should be reserved only for those of the lowest incomes. They also did not make much progress on the idea of having a resident management corporation take charge of many aspects of the development's governance. The residents—together with their activist allies—nonetheless made certain that the new North Beach Place would remain a place serving primarily those with the lowest incomes. Aided by a sympathetic HOPE VI team that listened to residents when formulating an original proposal that boldly stated that no loss of units would occur, and supported by a variety of neighborhood organizations eager and able to help tenants maximize their rights, the process of designing and developing North Beach Place can be seen as, overall, an exercise in community empowerment and capacity building.

## **Quinta Monroy: Using Incremental Approaches To Afford Infrastructure and Housing**

Efforts to develop low-income housing that extends support well beyond housing are even more common outside the United States. The need and opportunity to address broader urban resilience through housing is particularly salient in countries that face extreme deficits in water and sanitation infrastructure provision. For example, architects, residents, and policymakers in the middle-income country of Chile have developed models of incremental housing in tandem with infrastructure improvements for low-income families in informal settlements in areas of risk. These programs build on longstanding government efforts to provide urban housing and on citizen activism through land occupation and the establishment of informal settlements. Starting in 1906, the Chilean government passed legislation to create Workers' Housing Councils to address low-quality housing by developing housing projects for moderate-income households (Rojas, 1999). In the 1950s, "self-help" housing policies offered technical assistance to encourage households to use their own labor to construct housing (Greene, n.d.; Jiron, 2010). The government shifted responsibility

for production by enacting laws that created incentives for private-sector investment in housing development. The Ministry of Housing and Urban Development (MINVU) was created in 1965 to oversee the use of public funds to build housing for lower income households, coordinate the efforts of different government entities, and help establish more consistent housing policy (Rojas, 1999). MINVU addressed concerns about the supply of affordable housing by managing private firms' construction of housing units that were then sold to households using direct subsidized loans. In recent decades, the government has also introduced policies to address demand-side challenges. In 1977, the Chilean government pioneered the approach of giving low- and middle-income families upfront capital subsidies to be used in combination with private financing to purchase homes built by the private sector (Gilbert, 2004). The creation of savings and loan associations and the Popular Savings Plan encouraged households at all income levels to save money for housing and used these savings to finance mortgage-backed loans for home purchases (Rojas, 1999).

Despite these efforts, the number of housing units produced was insufficient to meet the need, especially for a rapidly urbanizing population. The urban population increased four-fold, from 3.5 million in 1950 to more than 15.0 million in 2010, which is now almost 90 percent of the total population (Greene, n.d.; OECD, 2013). Urban migration from rural areas combined with natural population growth among urban residents exacerbated housing demand. Citizens took matters into their own hands as they occupied marginal land and formed *campamentos*, or encampments, and *callampas*, or mushroom settlements. Hundreds of thousands of people lived in these informal settlements in urban centers and peripheral metropolitan areas (Jiron, 2010). The settlements were characterized by insecure land tenure, dirt floors, and a lack of potable piped water and sanitary disposal of waste water. According to national surveys, one-fourth of all houses experienced overcrowding, and nearly one-half of those occupied by the poorest residents were overcrowded (Micco et al., 2012). Early government efforts to eliminate informal settlements resulted in displacement and forced relocation to areas with inadequate infrastructure.

In this context, experiments with incremental housing strategies in Chile offer an example of addressing infrastructure challenges when building housing for resilient cities. A housing development in Quinta Monroy (exhibit 4), in the northern city of Iquique, represents one part of an evolving process in which designers, policymakers, and residents learn from experience. In 2003, the Chilean government contracted with Elemental, a prominent Chilean architecture firm, in partnership with Pontificia Universidad Católica de Chile, a private Catholic university in Santiago, and Empresas Copec, a Chilean energy and natural resources company. The objective was to provide housing for nearly 100 families on a 1.25-acre site in the central city, where residents had been living in informal settlements for 30 years. Faced with insufficient funds to build complete houses for every family, the firm proposed a design based on incremental construction of housing over time by residents. The design of the half-built home featured basic structural elements (roof, walls, and stairs) and infrastructure (kitchen, bathroom, and connections to utilities). Residents would add to this basic unit over time based on their family structure, changing needs, accumulated savings, and access to financing. The architect Alejandro Aravena noted, "The design is packaged first in identifying which is the half that a family will never be able to modify over time, no matter how much time, money, or energy they spend on their houses. And simultaneously, what design conditions will guarantee that house will gain value over time" (Aravena, 2008: 1).



## Exhibit 4

### Incremental Housing in Quinta Monroy, Iquique, Chile



Source: Annemarie Gray

In Chile, the Neighborhood Upgrading Program and related initiatives have sought to formalize informal urban settlements by developing physical infrastructure and social services. In the 1970s, a program was created to build basic sanitary units, consisting of a kitchen and bathroom with connections to water service, to address urban health problems (Brakarz, Greene, and Rojas, 2002). The Chile Barrio program, started in 1998, used funding from the national government to provide services, including potable water, sanitation, and paved streets; help secure land tenure; and eventually address poverty by encouraging the provision of childcare, health, and education services (Brakarz, Greene, and Rojas, 2002). As such, the Quinta Monroy project and its successors have served as a 21st century heir to many decades of effort to trigger neighborhood construction through sites and services approaches and, in architectural terms, are intellectual descendants of John Habraken's ideas about "supports" as "an alternative to mass housing" (Habraken, 1972; Hamdi, 1995; Turner, 1977). It is important to note that the Quinta Monroy effort is not on some distant greenfield site; rather, like the redevelopment in San Francisco's North Beach, it permitted an established community to remain rooted in place.

Critiques of the Chile Barrio program as a whole emphasize the tendency toward relocation in siting decisions and a lack of understanding of quality-of-life factors that go beyond the physical quality of housing (Jiron, 2010). Although the Quinta Monroy project was funded through the Chile Barrio program, the architects specifically emphasized the need to build new housing on the same site as the informal settlement to ensure families remained integrated into the network of

opportunities the city had to offer (Aravena, 2008). The families at Quinta Monroy had been living there for three decades and had developed strong local ties, social capital, and a sense of community during that time. Because the informal settlement was in the center of the city of Iquique, it had good access to transportation networks, healthcare services, educational institutions, and employment opportunities. This siting decision helped preserve and strengthen the social networks embedded in the community and the existing links to jobs and other income-generating activities.

The new construction of incremental housing also helped reduce the vulnerability of residents to environmental risks and stresses by improving the physical structure and safety of their dwellings and by enhancing personal security. Incremental housing replaced informal settlements that were built using found or cheap materials, subject to fire hazards, and rarely constructed according to building codes. The risk of building collapse was a major concern in the Quinta Monroy project given the seismic activity in Northern Chile. The incremental housing was designed around a strong structural core, made of concrete and cement blocks, that was engineered to support additional construction over time. The project resulted in structurally sound building construction that was resistant to earthquakes and flexible enough to accommodate residents' needs and changing conditions.

Empowering communities through enhanced capacities to share in their own governance remained a key theme throughout the project. Architects used a participatory approach to engage residents in creating designs for their housing and to build a sense of ownership in the project. The incremental housing design relies on residents to take an active role in developing and adding to their homes, which can be a source of empowerment. A recent visit to the site reveals that most of the buildings have customized additions, which reflect the investment of time, money, and other resources that residents have made in their homes. Residents also benefit from the increased value of their house as a financial asset. According to Executive Director Alejandro Aravena, every house in the Quinta Monroy project was valued at more than \$20,000 5 years after construction (Aravena, 2011).

Few formal studies have evaluated the extent of the participatory process at the Quinta Monroy project. Research has emphasized that, nationally, the Chile Barrio program fell short in its lack of resident participation and local control of the housing projects it built, as reflected in a lack of sense of ownership and an overall dissatisfaction with projects over time (Jiron, 2010). Although more research is needed to fully understand the extent and effect of resident participation in the Quinta Monroy project, the existing documentation of participation and the strong emphasis on retaining social and economic integration with the city suggests that Elemental's approach was unique in the context of national housing strategies for informal settlements.

The Quinta Monroy project in Chile represents one phase in an evolving process of learning how to address the housing and related infrastructure needs of low-income urban residents through incremental housing design. Elemental has completed more than 14 projects to date, with a handful of others in progress in other Chilean cities and other Latin American countries. Exhibit 5 shows the group's second incremental housing project, Lo Espejo. Each project retains its signature design features—structural shell, critical interior amenities, basic infrastructure, and designated public space—adapted to the individual size, geography, and budget of each project. Funding has expanded in more recent projects, and subsidies have allowed for incremental additions to be built at the time of original construction. Government partnerships with nonprofit organizations, like Un Techo Para Chile (A Roof for Chile), helped provide essential services to residents on site in

## Exhibit 5

### Elemental's Lo Espejo Incremental Housing Project, Santiago, Chile

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Source: Annemarie Gray

recent projects. Public funds were used to build childcare and job training facilities managed and operated by local organizations. These services helped residents find jobs and earn incomes that they could use to improve and expand their homes.

The project architects and policymakers have taken the lessons from Quinta Monroy and applied them to other incremental housing interventions in Chile and other countries. The approach—identifying what architects can design up front and what residents can build later—remains consistent, but the actual pieces have been adapted to respond to government funding, local climate, cultural context, and physical site constraints. Although careful evaluation of these projects is still needed, the case of incremental housing suggests that affordable housing should afford flexibility in its design, production, and use and should be conscious of the need to provide basic structure. The case also shows how the challenge of developing infrastructure can be transformed into an opportunity to build low-income housing that contributes to urban resilience.

## Village de L'Est: Affording the Return of a Community After Disaster

A third example illuminates another important dimension of what affordable housing can afford by demonstrating how local institutions can develop community capacity and support housing for resilient cities in the context of postdisaster reconstruction. The Village de L'Est neighborhood, in the eastern section of Orleans Parish, Louisiana, is in the southern part of a drained marshland bounded by Lake Pontchartrain and Chef Menteur Highway. The construction of residential and

commercial buildings on what were previously wetlands has contributed to subsidence problems over the years. The neighborhood is one of two in New Orleans East, a 32,000-acre development consisting mostly of suburban subdivisions built in the 1960s that was considered at the time to be the largest land parcel in the corporate limits of a major U.S. city held by a single owner (GNOCDC, 2002). Village de L'Est opened in 1964 as a 600-acre tract consisting of mostly one- and two-family houses and some large apartment buildings.

Although it once was a mostly African-American neighborhood, a significant Vietnamese community has called Village de L'Est home since first moving there in the 1970s. The Vietnamese residents of Village de L'Est trace their history to refugee resettlement after the Vietnam War. After Vietnam was divided in 1954 under the Geneva Accords, many community members in the Catholic dioceses of Bù Chu Phát and Diêm in North Vietnam fled to South Vietnam to escape the threat of religious persecution, and relocated to villages near Vung Tàu and Phúc Tinh in the Bà Rịa-Vung Tàu province south of Saigon (Airriess and Clawson, 1991; Leong et al., 2007; Seidman, 2013). In 1975, after the fall of Saigon, the U.S. government and faith-based organizations, most notably the Associated Catholic Charities of New Orleans, helped relocate nearly 1,000 Vietnamese refugees to New Orleans (Airriess and Clawson, 1991; Seidman, 2013). Local organizations and community activists assisted refugees in finding housing at the Versailles Arms Apartments, a 402-unit apartment complex that offered subsidized rent through HUD. By 1990, the Vietnamese population had grown to nearly 5,000 and the Village de L'Est neighborhood had nearly equal proportions of African-American and Vietnamese residents (Leong et al., 2007). Today, the Village de L'Est neighborhood is considered by some to be “synonymous” with the Vietnamese community in New Orleans (Truitt, 2012).

The Mary Queen of Vietnam Church, a focal point for the Vietnamese community in New Orleans East, was instrumental in helping residents return and rebuild their community after the levee failures following Hurricane Katrina caused widespread flooding (Seidman, 2013). The parish, founded in 1985, was led by Father Vien The Nguyen from 2003 to 2010. Before Hurricane Katrina, approximately 75 percent of Vietnamese residents in Village de L'Est identified themselves as Catholic and nearly one-third lived in poverty, which was higher than the rate for New Orleans (Leong et al., 2007; Seidman, 2013). After Hurricane Katrina flooded the neighborhood in August 2005, Father Nguyen tracked where church members had relocated as a result of evacuation and displacement. The church kept members socially connected and eased their return: by 2010, about 75 percent—or more according to some observers—of the pre-Hurricane Katrina Vietnamese community residents had returned to Village de L'Est (Leong et al., 2007; Seidman, 2013).

The rebuilding of Village de L'Est shows promising signs of resilience along several dimensions identified previously. Local institutions, in particular the Mary Queen of Vietnam Church, provided valuable support for community social structure, especially against the backdrop of mismanagement, bureaucracy, and political mishaps. After Hurricane Katrina, Vietnamese community members evacuated the neighborhood and moved in with family and friends all over the country. The church provided a central point of contact that linked the community even while they were physically isolated from their neighborhood (Seidman, 2013). Father Nguyen used the church's organizational structure to stay in contact with members, identify their whereabouts, provide connections to social services, and offer assistance in returning to Village de L'Est (Leong et al., 2007).



Community organizations also sought to improve the economic livelihood of residents by creating business support programs and economic development initiatives. Before Hurricane Katrina, many Vietnamese community members engaged in small-scale agricultural practices to grow a variety of fruits, vegetables, and herbs that typically were not found in New Orleans supermarkets. The form of gardening shown in exhibit 6 reflects the “kitchen gardens” of Southeast Asian villages used for household consumption rather than larger gardens used for commercial purposes. Residents took advantage of local drainage canals for irrigation and developed extensive gardens in their yards and on open land concentrated along the northern edge of the neighborhood, and they often sold surplus crops at a popular neighborhood Saturday market (Airriess and Clawson, 1991). The Village de L’Est Green Growers Initiative, a community member-owned and member-operated farmers’ cooperative that was developed in response to the April 2010 BP oil spill, promotes the work of local farmers by encouraging area restaurants and farmers markets to buy produce and other goods from community members. Other initiatives, like the Viet Village Urban Farm—a proposal to incorporate environmental sustainability principles and technologies into local agricultural practices—have not been realized, however (see Truitt, 2012). The church and community leaders sought to support and broaden the local economic base by creating the Mary Queen of Viet Nam Community Development Corporation, Inc. (exhibit 7), which was incorporated in May 2006 and engaged in business development projects, including applying for grants, helping business owners access funding from government rebuilding programs, organizing loan fairs for small businesses, and securing capital for business expansion (Seidman, 2013).

The positive signs in community and economic development have not been matched by efforts to reduce the vulnerability of residents to environmental risks; responsibility for risk reduction has been handled mostly by higher levels of government charged with improving levee protection and pumping systems. Like many parts of New Orleans, the Village de L’Est neighborhood is at or below sea level on former marshland and is constantly at risk of flooding (see FEMA, 2012). Federal

### **Exhibit 6**

#### **Front-Yard Gardens in Village de L’Est, New Orleans, Louisiana**



Source: Aron Chang

### Exhibit 7

#### Mary Queen of Viet Nam Community Development Corporation Website

Cơ Quan Phát Triển Cộng-Đồng  
**MQVN**

Mary Queen of Viet Nam  
Community Development Corporation, Inc

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01/01/2012 -  
Chúc Mừng Năm Mới!

MQVN Community Development Corporation, Inc. (MQVN CDC) was established by community leaders in May 2006 to assist Vietnamese-Americans in New Orleans East rebuild their lives and their community after hurricane Katrina.

In the immediate aftermath of hurricane Katrina, MQVN CDC played a leading role in providing emergency relief assistance as well as organizing Vietnamese-American residents to play an active role in the rebuilding of the community surrounding New Orleans East area.

Source: Mary Queen of Viet Nam Community Development Corporation, Inc.

recovery assistance to support rebuilding efforts through the Road Home program was stalled, and citywide rebuilding standards to mitigate flood risks were delayed for years (Kamel, 2012). Because the Village de L'Est community rebuilt so quickly to meet the needs of returning residents, the rebuilt housing matched what existed before the hurricane: mostly one- and two-family homes with slab-on-grade construction. This building system is still prone to extensive damage from flooding, however. In effect, instead of altering the form of housing, neighborhood residents simply redoubled their faith in the federal and state governments' capacity to manage the infrastructure on which the neighborhood's overall viability depends. More attention to the design and structure of the buildings could have resulted in housing that offered better protection from rising waters or other environmental threats—without relying on the actions of government agencies.

Local institutions and social cohesion helped to empower the Vietnamese community and enhance their capacity and involvement in political organizing and civic affairs. As many neighborhoods struggled with rebuilding after Hurricane Katrina, the Mary Queen of Vietnam Church helped residents organize and successfully petition Entergy Corporation, the local electric utility company, to restore service in mid-October 2005, only a few weeks after the storm hit (Leong et al., 2007; Seidman, 2013). After lengthy negotiations with the federal government, the Mary Queen of Vietnam Church successfully secured an agreement to lease church land for 199 Federal Emergency Management Agency (or FEMA) trailers to provide temporary housing, but ultimately only one-fourth of the units benefited community members (Seidman, 2013). The community's rebuilding efforts were

challenged again in February 2006, when then-Mayor Ray Nagin issued an executive order to approve the operation of the Chef Menteur Landfill without a permit for the disposal of potentially hazardous debris resulting from hurricane damage. Residents were concerned that the landfill, which was less than 2 miles from Village de L'Est, did not have proper environmental protections in place and could contaminate the soil and water supply. Working with other residents, environmental groups, civil rights organizations, and politicians, the Vietnamese community pressured government officials to close the landfill. As shown in exhibit 7, they used community organizing, legal, and political tools to conduct community outreach to inform residents of environmental hazards, form a coalition called Citizens for a Strong New Orleans East, file lawsuits in state and federal court, and meet with city council members. After the community organized a protest involving several hundred people at City Hall in May 2006, a few weeks before the mayoral election, and planned an act of civil disobedience to block the entrance of the landfill in August, the mayor relented to their demands by allowing the landfill exemption to expire, and a federal judge denied the landfill operator's request to keep the landfill open (Seidman, 2013). Activists also created the Vietnamese American Young Leaders Association of New Orleans to develop the skills of young residents in organizing their community and taking part in decisionmaking, by organizing neighborhood cleanup events, managing a youth community center, and engaging in civic activism (Seidman, 2013). Building on these successes, the Vietnamese community has sought to expand its base and partner with other community groups and organizations, in particular the significant Latino and African-American communities living in and around Village de L'Est (Leong et al., 2007; Seidman, 2013).

Faced with the destruction of their neighborhood after Hurricane Katrina, the Vietnamese residents of Village de L'Est coalesced around local institutions to help restore and rebuild their homes. The institutional structures of the Mary Queen of Vietnam Church and other organizations helped knit the community fabric together, even when different strands and members were physically separated, and also provided social support to withstand the multiple economic, political, and psychological obstacles to returning to their neighborhood. Some setbacks have occurred. A planned housing development for elderly residents was not completed, and the recovery has been distributed unequally, as many homeowners have returned to rebuild their homes but some rental apartment buildings lay vacant and damaged (Seidman, 2013). The long and difficult process of dealing with the challenges of rebuilding appeared to strengthen the organizational capacity of the Vietnamese community, which has emerged as a potent political force in New Orleans. Although the housing itself was not rebuilt to manage flood risk adequately, the fact that it was redeveloped swiftly led to strengthened social cohesion, local economic development, and political organizing in the aftermath of Hurricane Katrina. The experience of the Vietnamese residents of Village de L'Est shows that housing can afford not only the return of individuals, but also the rebuilding of a community after disaster.

## **Banda Aceh: Rebuilding Homes and Communities To Afford Livelihoods**

The reconstruction of villages in and around the city of Banda Aceh, Indonesia, after the 2004 tsunami offers insight into how local communities outside of the U.S. context can rebuild housing

for resilient cities when disaster strikes. The landmass in Indonesia comprises more than 17,000 islands—it is the largest archipelago in the world—so it is especially vulnerable to water-based natural disasters. Its position is made even more precarious by its violently exposed presence on the western edge of the Pacific Ocean’s “Ring of Fire,” an area of high volcanic and seismic activity. On December 26, 2004, a massive 9.1- to 9.2-magnitude earthquake off the coast of Sumatra triggered a tsunami that destroyed much of Banda Aceh—the provincial capital and largest city in the province of Aceh. Destruction from the earthquake and tsunami resulted in the deaths of more than 200,000 people—more than 60,000 in Banda Aceh alone—and the displacement of at least 500,000 residents in Aceh. Local and international aid agencies estimated that more than 100,000 housing units needed to be replaced, including nearly 90,000 in Banda Aceh, and another nearly 100,000 units required rehabilitation (Steinberg, 2007). The reconstruction process in Banda Aceh provides an example of community engagement and housing adaptation in response to past, present, and future environmental threats.

Some observers have suggested that a second tsunami struck Banda Aceh in the form of a massive invasion of more than 300 donor agencies, humanitarian aid groups, and private foundations—some with little to no experience in housing construction and rehabilitation after a disaster (Syukrizal, Hafidz, and Sauter, 2009). Funding imperatives to spend money quickly and focus on physical reconstruction led to swift responses that relied on foreign capacity, which resulted in uncoordinated efforts that frequently disregarded the local sociocultural context (Syukrizal, Hafidz, and Sauter, 2009). The Indonesian government initially declared that permanent building construction was prohibited on land within 1.5 miles of low-lying coastal areas (Aquilino, 2011). The government’s plan called for building a new city several miles from the coast, forcing thousands of families to relocate from their home communities and a major source of economic livelihood (Steinberg, 2007). Such a proposal, similar to the initial response in Sri Lanka discussed previously, revealed a narrow desire for resilient housing that ignored the close connection between housing location and place of employment. In response, Urban Poor Linkage (Uplink)—a network of nongovernmental and community-based advocacy organizations established in 2002—and other groups proposed that residents instead rebuild their homes in the areas where they previously lived (Syukrizal, Hafidz, and Sauter, 2009). Public opposition to the government’s relocation proposal was so great that the government eventually shelved the plan. Uplink proceeded to create a local arm of the organization, Uplink Banda Aceh (UBA), to assist area communities with the rebuilding process.

With funding from international organizations, UBA engaged with communities in 23 villages, or gampongs, along the western of the edge of the city in a resident-driven reconstruction process.

It began by ensuring people’s basic needs were being met, then collected data on the survivors and organised people so they could start making their own decisions, planning their own communities, and reconstructing their lives (in every sense) according to their own needs and priorities. This ‘reconstruction of life’ approach means [UBA] does not take the physical aspects of development as a goal; instead creating housing and infrastructure is the entry-point for building people’s capacity, for their participation, for trauma-healing, and for ensuring their self-determination and independence. (Syukrizal, Hafidz, and Sauter, 2009: 4)



To help build community capacity to manage reconstruction planning, in March 2005, UBA helped form Jaringan Udeep Beusaree (JUB), a grassroots organization whose name means “a network for living together” or “the village solidarity network.” To help restore communities, UBA and JUB worked together and established what conditions existed before the disaster by collecting information on village demographic characteristics, family residential location, and individual employment experience. The groups organized residents and encouraged them to fill out surveys so that the reconstruction planning process would be more responsive to individual circumstances and needs (Aquilino, 2011; Syukrizal, Hafidz, and Sauter, 2009).

At a fundamental level, urban resilience depends on residents having access to basic shelter, but shelter rapidly intersects with additional priorities. “Housing reconstruction and rehabilitation is seen as central to the reconstruction of communities, which needs to be integrated with other sectors, particularly economic and social recovery” (Steinberg, 2007: 153). UBA addressed immediate postdisaster housing needs by working with villagers, who determined the shape and materials needed to build temporary shelters. The shelters were built from recovered and recycled materials, including timber and nails that residents collected from debris, and replaced the emergency tents that provided little privacy and protection from the elements. Within 5 months, residents and UBA had successfully constructed 450 temporary shelters across 23 villages (Syukrizal, Hafidz, and Sauter, 2009). The participatory process continued through the planning of permanent housing. UBA partnered with JUB to conduct a community survey and manage community-mapping projects with the goal of obtaining an accurate census of all local residents and to ensure their voices were included in reconstruction planning. By February 2007, a little more than 2 years after the tsunami, the community had constructed more than 3,000 homes and 12 community centers for resident use (Syukrizal, Hafidz, and Sauter, 2009). Exhibit 8 shows an example of a well-maintained UBA house (right) by comparison with a poorly maintained house (left).

## **Exhibit 8**

### **Examples of Post-Tsunami Housing, Banda Aceh, Indonesia**

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*Note: A well-maintained Uplink Banda Aceh house (right) as compared with another post-tsunami house (left).*

*Source: Miho Mazereeuw*

The community-driven reconstruction process in Banda Aceh was inherently designed to support and rebuild the social structure and economic livelihoods of residents and enable them to remain in place. The trauma of the tsunami deeply affected the psychological well-being of villagers, especially because so many depended on fishing for food and trade but were reluctant to return to the water. UBA and JUB addressed the mental health needs of residents by organizing community-healing programs involving art therapy. According to one resident, “With this... we can have something positive to do and forget the trauma we experienced from the tsunami because we have something to keep us busy. We feel better now, because we can allow our anger and sadness to escape..., we can express our feelings through a different medium.... It has brought us closer together and now we are closer to women from other villages too” (Syukrizal, Hafidz, and Sauter, 2009: 9). JUB also helped establish community organizations to bring residents together at social events around the topics of art, culture, sports, and health (Syukrizal, Hafidz, and Sauter, 2009).

The earthquake and tsunami damaged the economic livelihoods of villagers, so local organizations sought to restore and rebuild income-generating opportunities around residents’ skills and experience. Farming was a major source of food and income for villagers, but saltwater pouring in from the tsunami damaged large areas of farmland. To address this issue, nongovernmental organizations trained villagers to collect compost and make fertilizer from fermented fruit juices to replenish the soil for farming (Syukrizal, Hafidz, and Sauter, 2009). In addition, education programs introduced farmers to new technologies that improve planting and harvesting productivity and to crops that can successfully grow in high-salinity soil (Steinberg, 2007). Some of the new and reconstructed housing was raised on posts, which created a covered, protected space on the ground floor that could be used to support small businesses or to store fishing and farming equipment (Aquilino, 2011).

The resident-led rebuilding process also addressed the pressing concern of vulnerability to environmental risks and stress in the face of potential future natural disasters. UBA collaborated with residents to design and develop five housing models that featured seismic protections and earthquake-resistant characteristics. Houses built on stilts were designed to withstand flooding in low-lying coastal areas and to protect against land subsidence. In addition, the models included different floor plans to accommodate changing family structure and needs (exhibit 9). The development and construction of earthquake- and flood-resistant housing helped reduce the community’s vulnerability to future disasters (Aquilino, 2011). Infrequent building inspections and the lack of a building permit system, however, compromised the effectiveness of the rebuilding efforts in protecting residents from potential environmental threats (Steinberg, 2007).

In parallel to the various housing reconstruction efforts following the tsunami, larger geopolitical forces also worked to enhance personal and community security. In August 2005, the government of Indonesia and the Free Aceh Movement, or GAM, reached a peace accord in Helsinki, Finland, that helped facilitate the overall reconstruction efforts in Aceh after the tsunami. Coming only 8 months after the tsunami, this peace accord enabled other community building efforts to move forward.

The emphasis on resident input and involvement served to empower communities and enhance their capacity to share in their own governance throughout the reconstruction process. JUB, the grassroots community organization, was created to help residents to organize and to lead rebuilding efforts through a bottom-up approach, in contrast with top-down government interventions.

## Exhibit 9

### A Collection of Rebuilt Homes, Banda Aceh, Indonesia



Source: Miho Mazereeuw

Self-determination was a key theme, as community members met each week to present problems, discuss possible solutions, and vote on options. In addition, homeowners managed the construction of their homes, with funding from humanitarian aid organizations to pay for building materials and labor, so they were closely involved and personally invested in the reconstruction process.

In Banda Aceh, nongovernmental organizations carefully engaged and worked closely with village residents to help ensure that community needs, not the agendas of outside agencies, would drive the reconstruction process. An in-depth community engagement approach requires time to build trust, gain access to information, discuss needs and priorities, deliberate over options, and develop consensus. The reconstruction of villages in Banda Aceh may have proceeded faster if international aid agencies or foreign governments had imposed decisions and actions, and speed may be particularly important in postdisaster recovery situations. Quick responses that ignore local context, however, can incur other costs. Anecdotal reports suggest that recovery programs initiated by outsiders, such as cash-for-work programs that paid money to residents to clean up debris and build homes, weakened the local cultural concept of *gotong royong*, or communal work, so that residents expected payment and were less likely to lend help without compensation (Lamb, 2014). Taken overall, however, the case of reconstruction in Banda Aceh shows that housing can also afford community participation and empowerment.

## Conclusion: Successful Struggles To Maximize What Affordable Housing Can Afford

Looking across these four examples of affordable housing as a means to pursue more resilient cities, it is clear that each case reveals both strengths and shortcomings. In San Francisco, tenants and their allies did something highly unusual in the context of the HOPE VI program: they retained

one-for-one onsite replacement of public housing in a rapidly gentrifying neighborhood. The new North Beach Place did not, however, deliver everything that residents wanted: implementing resident-driven business incubator space has proven elusive, and the very design of the housing, with its plinth and gated perimeter, represents an improvement over the free-access insecurity of the former project but also prompted new concerns about an excess of rules and surveillance that have left many residents uncomfortable. In Chile, a partnership between architects and government that produced the much-celebrated incremental housing in Iquique revived and expanded previous notions of sites-and-services approaches. It did so by upgrading an existing community in situ in ways that sought to preserve livelihood generation and to make residential life more hazard resistant. The example of Chile nonetheless raises questions about whether the incremental provision of housing (as opposed to more fully realized structures) imposes a greater burden than is absolutely necessary, giving short shrift to low-income residents simply because they are poor and fully completed housing developments are expensive.

In the context of disaster recovery, the remarkable efforts of the Vietnamese community in Village de L'Est, wherein a faith-based network built new sources of jobs and development networks, seem wholly laudable. The reconstructed housing remains substantially unchanged, however, still mostly representative of a slab-on-grade mode that remains all too vulnerable to future floods and entirely dependent on externally managed barriers that the community cannot control. Finally, the community recovery efforts led by Uplink and its partners in Banda Aceh may represent the most fully rounded realization of the four criteria proposed here for what affordable housing should afford—all the more noteworthy because it has come in the context of some of the most devastating urban trauma that the world has seen in recent decades. The process of community engagement was time consuming but, because it started very early, it helped meet the pressing needs of surviving residents who had lost family, homes, and livelihoods.

Each of these cases demonstrates in different ways that affordable housing can afford far more than shelter for low-income groups. Affordable housing can contribute to resilient cities by (1) supporting the community social structure and economic livelihoods of residents, (2) reducing the vulnerability of residents to environmental risks and stresses, (3) enhancing the personal security of residents in the face of violence or threats of displacement, and (4) empowering communities through enhanced capacities to share in their own governance.

These cases ultimately may not count as full-fledged successes (and what project can claim perfection?), but they do exemplify a kind of “successful struggle.” In each case, that struggle has been rooted in the fight to stay put in spatially defined and socioeconomically constructed communities, even in situations in which those communities have been saddled with ongoing dangers and environmental hazards. In-situ approaches may not be effective—or even appropriate—for every situation, but if relocation is justified, then it must be equitable in its applicability and implementation. These cases reveal that, while the struggle may centrally revolve around the provision of housing, it extends well beyond that to address greater challenges facing poor residents. As one assessment of the work in Banda Aceh put it, “Reconstruction is about lives, not just houses, and can be an opportunity . . . to deal with underlying poverty and environmental problems and to improve the lives of low-income communities” (Syukrizal, Hafidz, and Sauter, 2009: 4). The processes that residents, community leaders, and their various partners have undertaken have not



always succeeded in remedying problems or removing the sources of risk, but they have launched both discussion and action in service of those goals. Because they framed their struggles from the beginning as being about more than the affordability of housing, they were able to expand the agenda for what else housing must afford. They viewed investment—or reinvestment—in housing as intrinsically connected to the greater set of political, social, cultural, and economic reasons why their community was, on balance, much better off remaining where it had been. As a result, residents and their supporters have worked in service of a greater goal: the equitable and inclusive resilience of cities.

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# Disaster Recovery and Community Renewal: Housing Approaches

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## Abstract

*How we understand and measure success in disaster recovery establishes the policy platform for how governments prepare for future events. In the past two decades, observers have recognized that the return to pre-event conditions is often unworkable—not only because the pre-event conditions were hazardous, but also because the disaster has created a new normal, requiring new ways of thinking and planning. Disaster recovery means more than restoring physical infrastructure and reconstructing housing and commercial buildings. Recovery is now linked to the concepts of resilience and community renewal, with social, economic, institutional, infrastructural, ecological, and community dimensions. Recent research has helped to identify the linkages among several factors: the welfare of individuals; the welfare of households; business and civic recovery; and the importance of health, education, housing, employment, and environmental conditions in recovery. The capacity for renewal, reorganization, and development is critical for ultimately going beyond recovery to community resilience. The range of approaches to the recovery process after recent earthquakes in Chile, China, Haiti, Italy, Japan, New Zealand, and other countries offers insights into successful policies and challenges to integrating housing and recovery at the human and civic levels.*

## Introduction

Jobs and housing are often cited as the key elements of disaster recovery. Individuals and communities struck by an earthquake, hurricane, or other calamity cannot “return to normal” unless people have means of supporting themselves and places to live. For residents and for the community as a whole, however, normalcy also requires that community services such as roads, bridges, and the utility infrastructure be functional; schools, health care, and social services be available; and banks, businesses, and governments be functioning. The way recovery is defined, the way it is financed, and the metrics used to evaluate its success or failure are critical to the kinds of assistance policies governments devise.

The concept of disaster resilience can be defined simply as the capacity to rebound from future disasters. Several efforts are under way in the United States and globally among researchers and policymakers to develop the means of measuring and monitoring community resilience. Although no single model can quantify disaster resilience, the growing consensus is that resilience is a multifaceted concept, with social, economic, institutional, infrastructural, ecological, and community dimensions (NRC, 2010; Peacock et al., 2008). Several sets of resilience indicators or attributes can serve as baselines for measuring recovery progress and outcomes after a disaster event (Bruneau et al., 2003; CARRI, 2009; Cutter, Burton, and Emrich, 2010; Miles and Chang, 2006; Norris et al., 2008; Twigg, 2009). Community functions such as infrastructure, housing, economic viability, and social conditions are typically listed as performance indicators. This excellent work on resilience has advanced understanding of the multifaceted components of recovery and provided metrics for measurement, but there is a need to translate academic concepts into programs to help people in affected communities and local governments and to redefine policies in agencies at the national government level.

Theory, unfortunately, is way ahead of practice. Even with the Federal Emergency Management Agency's (FEMA's) development of the National Disaster Recovery Framework, several problems make implementing forward-thinking ideas on resilience and recovery problematic.

1. **Lack of preparedness for recovery.** With the exception of a few cities in Japan and California, most jurisdictions and most individuals are not prepared for any major disaster or national emergency. Not only are individuals unprepared, communities are largely uninsured and have unrealistic expectations that government will make them whole. Jaffee and Russell (2013) identified four major trends in the economics of catastrophes since World War II: (a) the number and severity of catastrophic events is increasing; (b) insurance markets that cover these risks have steadily disappeared; (c) government relief has expanded significantly; and (d) public- and private-sector actions to mitigate risks, including avoiding development in risky areas and reinforcing structures, has been limited. Although many societies invest a great deal of effort in teaching the basics of emergency preparedness (such as “duck and cover”), those same societies have invested little in serious planning for recovery from disasters.
2. **Lack of local implementation capacity.** Like individuals, local governments are pushed beyond their capacities during and after a disaster. In normal times, cities collect taxes, manage traffic, repair potholes, and balance the concerns of residents and businesses. None have financial reserves for disasters. City government agencies know how to regulate for planning and building, but most do not have the staff to think in terms of redevelopment, economic development, or new housing models—all of which are critical after a disaster. City governments often lose their tax base after major disasters, and they struggle to provide basic services while attempting to negotiate national government funding and manage a recovery process for citizens and business.
3. **Lack of funding.** In the United States, the national government supports the restoration of highways and public infrastructure, but government funding to assist with housing—which typically represents 50 percent of the value of any disaster loss—is very limited. Funding is also lacking to support the human effort needed to implement a truly coordinated recovery effort. In both developed and developing countries, disaster recovery aid is often narrowly targeted toward building physical facilities, particularly infrastructure, without comprehensive housing, social, and economic development efforts.

4. **Antiquated and inflexible government programs.** Most countries that have disaster aid legislation will find that it is based on historic events that do not reflect current social or economic circumstances or levels of urbanization. In the United States, for one example among many, the Stafford Act<sup>1</sup> allows only for the federal government to provide “temporary housing.” As a result, an idea such as the one for the Katrina Cottages—small starter homes designed in the wake of Hurricane Katrina in 2005 at a lower cost than temporary trailers—could not be funded under the Stafford Act. Although an Affordable Housing Pilot Program, or AHPP, responsive to the Katrina Cottages idea was implemented in different ways in four states after Hurricane Katrina, only a relatively small number were built, and the idea of cost-efficient and permanent government-funded housing would not be possible in the future without special congressional authorization.
5. **Poverty and dilapidated public institutions.** Whether in Haiti, Latin America, Africa, Asia, or parts of North America and Europe, health care, education, clean water and other basic public services are simply not accessible for the world’s poor citizens. Disasters in these settings cause what Farmer (2011) calls “acute-on-chronic” problems that humanitarian aid cannot begin to resolve.

Recognizing the problems with disaster recovery implementation is a first step to thinking about how to operationalize resilience ideas. Scholars involved with resilience in relation to complex adaptive systems increasingly avoid the use of the term “recovery” and prefer the concepts “renewal,” “regeneration,” and “reorganization” (Bellwood et. al., 2004). If resilience is considered as an approach to disaster recovery, it can become a valuable tool for policies that support sustainable redevelopment.

## **Housing As a Core Element of Recovery and Renewal**

Housing is a core element of daily life and a critical component of any disaster recovery effort. In most parts of the world, housing is privately owned and, as such, housing recovery is managed differently than recovery in the public sector (roads, schools, hospitals, and government and cultural facilities). Housing recovery, however, is critically interdependent with recovery of those public-sector facilities. Until the 1970s, no U.S. disaster assistance policies provided any funding for housing recovery. Later, small programs were designed to assist homeowners with Small Business Administration (SBA) loans and modest FEMA grants for limited repairs, but national policies assume that private funds, insurance, or both will be used for housing repair (Comerio, 1998). In the United States, limited U.S. Department of Housing and Urban Development involvement in public housing repairs and block grants for rental housing repairs are insufficient to meet the needs in contemporary society.

In the United States, policymakers assume that the private property market will adapt in post-disaster situations. Economic conditions since the financial crisis of 2008, however, suggest that markets alone would not be able to solve postdisaster housing reconstruction. The nation now has 10.8 million homeowners (heavily concentrated in disaster-prone regions such as California and Florida) whose home value is less than their mortgage (Zillow, 2013). These homeowners are

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<sup>1</sup> *Robert T. Stafford Disaster Relief and Emergency Assistance Act*. Public Law 93-288.

not likely to have disaster insurance—only 11 percent of California homeowners have earthquake insurance (Jones, 2014)—and, should a disaster occur, they would not qualify for SBA loans. Typical FEMA individual assistance programs would not cover their repair costs. Without assistance, would homeowners abandon their homes? Where would they go?

U.S. policies furthermore assume that renters can find alternate rentals, but, in what has become a highly urbanized society, multifamily losses will leave many renters homeless while building owners make investment decisions that may not include replacement housing. In the San Francisco Bay Area, after the 1989 Loma Prieta earthquake, it took 10 years to replace 75 percent of the affordable housing lost. It took 4 years to rebuild middle-class apartments lost in Los Angeles after the 1994 Northridge earthquake, and it took 7 to 10 years to rebuild housing in Kobe, Japan, after the 1995 Hanshin-Awaji earthquake. In New Orleans, the recovery since Hurricane Katrina made landfall in 2005 has been extremely uneven, with high out-migration, limited home repairs, persistent vacancies, and very few new rental units replaced (SPUR, 2012).

In San Francisco, where 75 percent of the city dwellers are renters, 25 percent of the city's housing would be rendered uninhabitable in a magnitude (M)7.25 earthquake on the San Andreas Fault. The city does not have enough shelter capacity, much less interim-housing capacity, for that population (SPUR, 2012). This shortage is not unique to San Francisco. In urban settings around the world, renters and squatters make up 30 to 70 percent of the housing market (Mukherji, 2011, 2010) and have limited capacity to find alternate housing after disasters.

Everyone who loses their home in a disaster has needs greater than shelter. They need to replace their possessions—clothes, medicine, car, bicycle, documents, and so on. They need to know if they have a job, if their children will have a school, if an injured family member can get medical care, or if health care will be available for chronic and routine needs. If they are homeowners, they depend on rulings from local government regarding the safety of their dwelling and permits for repairs, if they can finance the repairs. Legal renters have to find alternatives (with some federal assistance), but shadow renters (families who double up, those in short-term single-room occupancy rentals, squatters, immigrants, and so on) also need alternatives and have no status in government programs. They can seek help only from churches and nongovernmental organizations (NGOs).

All those who lose their homes, however, need to decide whether to stay (rebuild or find alternative accommodations) or to leave the disaster area, and they all need information. What they need is an understanding of what help is available to them and what public decisions will affect their private decisions. Individuals' capacity to stay in a disaster-affected jurisdiction is as much about their jobs and the availability of services as it is about how to solve their shelter problem. Will the incentive to stay be greater if individuals and families are engaged in a community process? Will the programs enhance individual and community resilience? Examples from Chile and New Zealand, discussed in the next section, represent two different approaches. In Chile, the national effort to rebuild low- and moderate-income housing is an attempt to improve housing standards and to promote community empowerment and economic development. In New Zealand, the availability of government insurance is funding repairs at the same time that government policies are focused on regulating land use and improving building standards to inform individual decisions.



## Lessons From Chile and New Zealand

Comparing the disaster losses and recovery programs of different countries is extremely difficult when local conditions make each situation unique, but some generalizations can be made. The greatest loss of life tends to be concentrated in developing countries, whereas substantial property losses typically are a result of urban disasters in developed countries. The scale of housing loss is a combination of the disaster's intensity, the level of building code enforcement, and the quality of construction. Housing recovery (and recovery in general) is often a combination of a proactive government role in the reconstruction process, funding, community participation, and resilient improvements in infrastructure and planning.

To measure the success of recovery, it is important to look at different scales of intervention over different timeframes. Success in recovery will depend first on the scale at which that recovery is measured: at the level of the individual or household, at the level of the neighborhood or community, or at the level of the city or region. Success in recovery will also depend on the timeframe in which recovery is measured: in years or in decades. Finally, the degree of success in recovery will depend on the perspective of the evaluator: a family, a community, a government, an outside funder, or an independent evaluator (Comerio, 2005).

With the caveat that comparisons are difficult and tempered by differing perspectives and timeframes, it can be useful to compare Chile's and New Zealand's housing recoveries, along with those in other countries with a strong central government role in recovery management, with housing recoveries in countries characterized by a more limited government role. Exhibit 1 provides a comparison of losses in six recent disasters. Three recoveries (in Chile, China, and New Zealand) had strong

### Exhibit 1

Comparison of Losses in Selected Recent Disasters

	Strong National Government Role in Recovery			Limited National Government Role in Recovery		
	Chile	China	New Zealand	Haiti	Japan	United States
	<b>M8.8 earthquake and tsunami, 2010</b>	<b>M7.9 Sichuan earthquake, 2008</b>	<b>M7.1/M6.3 Canturbury/Christchurch earthquakes, 2010–11</b>	<b>M7.0 Port-au-Prince earthquake, 2010</b>	<b>M9.0 earthquake and tsunami, 2011</b>	<b>Hurricane Katrina, 2005</b>
Damage value (\$ billions)	\$30	\$30–50	\$40	\$12	\$300+	\$80–150
Housing units lost (thousands) <sup>a</sup>	370	5,000	17	300+	113 <sup>b</sup>	500
Deaths	526	90,000	184	316,000	19,000	1,970

M = magnitude.

<sup>a</sup> Housing units lost is an attempt to quantify those units that were uninhabitable after a disaster. The number of units damaged is much greater in all cases.

<sup>b</sup> Plus 82,000 evacuated because of nuclear radiation.

national government leadership, and three (Haiti, Japan, and the United States) had more limited government roles. Note that all the countries listed, except Haiti, have building codes that are similar to those in the United States, although construction practices and oversight vary.

## **Housing Recovery in Chile**

On Saturday, February 27, 2010, at 3:34 a.m. local time, an M8.8 earthquake struck the south central region of Chile. The earthquake produced a tsunami that caused major damage over 630 kilometers of coastline. The earthquake and tsunami impacted 75 percent of the population of Chile, which is concentrated in six central regions. Overall, some 370,000 housing units (10 percent of the housing in the six regions) were affected. Of those units, 220,000 (60 percent) were rebuilt with government assistance and 150,000 (40 percent) were repaired or rebuilt privately, often with insurance. Of the 220,000 units targeted for government assistance, 109,000 involved repairs of damaged homes and 113,000 required rebuilding (MINVU, 2011). Within a few months after the earthquake, Chile developed a national reconstruction plan that required special legislation and funding through various business taxes and (unaffected) property tax increases. The plan covered major sectors, including infrastructure, hospitals, schools, and so on. Housing, a central element of the plan, was managed by the Ministry of Housing and Urban Development (MINVU). MINVU, whose mission is to improve the quality of housing for vulnerable populations, thought the earthquake and tsunami overturned 4 years of housing program efforts to reduce the already existing housing deficit (Comerio, 2013).

The reconstruction plan was aimed at low- and middle-income populations (annual incomes of less than \$12,000 per family per year and home values of less than \$88,000). The process involved coordinating more than 239 municipalities and included reconstructing temporary and permanent housing, urban planning, and reconstructing historic heritage. More than 70 percent of the homes to be rebuilt were on sites where the beneficiaries had a house before the disaster, which meant that, in Chile, recovery policy was focused on keeping families in their communities, limiting greenfield developments, and improving seismic and thermal rebuilding standards in rural and urban localities.

A variety of options were available to qualified families: funds to repair an existing house, to acquire a new house, to build a new house on the owners' land, to build a house on a new site, or to build units in social housing (see exhibit 2). Repair funds were dispersed in three increments (of 30, 30, and 40 percent) to ensure that funds were used for construction. Landowners needing new homes could choose from models based on presentations from several predominantly local builders, some of whom offered prefabricated homes, some of whom offered site-built homes, and all of whom MINVU precertified for engineering standards. After the community voted, the builder received the contract for that community—providing some advantages of scale for builders in remote regions and encouraging competition among builders. Families could also add additional rooms or special finishes after the base unit was provided.

Families without land were accommodated in temporary camps while social condominium projects were designed and completed. These projects typically improved on previous housing quality in terms of unit size (from 38 to 50 square meters), services, and site amenities. In cities such as Talca, where 30 percent of the housing stock was damaged, additional subsidies enabled builders

**Exhibit 2**

**Breakdown of Number of Units by Programs**

Approach	Problem		
	Repairable House, Landowner	Nonrepairable House, Landowner	Nonlandowner
Family led	12,000 use banks of materials for repairs	3,000 acquisitions 3,000 do-it-yourself buildings	16,000 acquisition subsidies
State led	32,000 social condominium repairs	8,000 social condominium demolitions/rebuildings	30,000 new developments
Third-party intermediary led	84,000 repair subsidies	48,000 precertified houses	4,000 urban densifications

Source: MINVU (2012)

to work on inner-city sites in an attempt to counteract the rush to build on the periphery. In coastal cities, new master plans were developed for tsunami protection, infrastructure, and urban relocations.

Within 1 year after the earthquake, 60 percent of the government subsidies were allocated, 35 percent of the housing was in construction, 5 percent of the new housing was complete, and all insurance payouts were complete. After 2 years, all the subsidies were allocated and about 70 percent of the home repairs were complete, but only 10 percent of the new construction was complete, although 45 percent had started. After 3 years, 68 percent of the government-funded housing was complete and, at the fourth anniversary, in February 2014, nearly all 220,000 units were complete (Comerio, 2013).

The Chilean government’s housing program demonstrates an effort to combine new, safe building technologies with local vernacular lifestyles and to improve the welfare standards for a significant population. The program is also remarkable because it reflects a policy that kept most of the reconstruction as part of the urban fabric instead of in greenfield developments. It was conceptualized and funded at the national level, but local and regional agencies handled management and implementation—with oversight from local architects and engineers and construction competitively bid by local builders. Plans for hazard abatement were integrated into coastal redevelopment, and efforts were made to rebuild with greater density to counteract exurban development. What is important to success in the Chile case is the combination of political will, funding, strong leadership, flexibility in adapting existing programs, and professional best practices (Comerio, 2013). The overall program was extraordinarily successful in terms of replacement housing, improved building standards, improved resilience for future disasters, and maintained community cohesion.

**Housing Recovery in New Zealand**

In the early hours of Saturday, September 4, 2010, people in Christchurch and the surrounding Canterbury region of New Zealand were surprised by an M7.1 earthquake, the most damaging earthquake to hit the country since 1931. The epicenter was located west of the city, which experienced moderate shaking levels, but the earthquake caused major damage because liquefaction

and lateral spreading affected sewer and water lines and damaged home foundations. The earthquake caused significant nonstructural damage but limited structural damage to buildings throughout Christchurch. This event was followed by thousands of aftershocks (Geonet, 2012). The most damaging occurred on February 22, 2011, when a shallow M6.3 earthquake devastated the central business district and caused widespread foundation movement and extensive utility loss across the city, with the heaviest liquefaction damage in the eastern suburbs (EERI, 2011).

Christchurch, a city of about 400,000 people and the largest city on the South Island, has a housing stock composed primarily of well-built, single-family, wood-frame homes, with only a smattering of condominiums and apartments. Approximately 87 percent of the homes in greater Christchurch were damaged. Of those, 30 percent had major damage and 70 percent sustained minor damage (EQC, 2012; Markum, 2012). In most cases, liquefaction and subsidence were the predominant causes of damage and ongoing problems. In a country with a population of only 4 million, the national government took a proactive role in recovery. It established the Canterbury Earthquake Recovery Authority (CERA) to act as facilitator and coordinator, particularly for planning and implementing the downtown and infrastructure recovery. The government insurance program, the Earthquake Commission (EQC),<sup>2</sup> managed residential claims. EQC provides earthquake and fire insurance that is required with every mortgage. Approximately 95 percent of New Zealand homeowners have EQC-backed earthquake insurance coverage.

At the time of the earthquakes, an EQC insurance policy cost homeowners \$67.50 New Zealand dollars (NZD) per year and provided protection of up to \$100,000 NZD for a dwelling (building) and \$20,000 NZD for contents (personal belongings). If the site was destroyed (originally conceptualized for landslides, but applicable in the liquefaction zones), an amount for the land lost could also be added. When the actual damage was beyond the EQC limit, homeowners were responsible for the difference, either from savings or additional private insurance (EERI, 2010).

Although the EQC was well capitalized, the courts ruled that claims from each event must be covered separately, which led to a situation in which EQC was managing more than five times the number of claims as there were damaged homes. The claims furthermore had to be apportioned over 12 different events among EQC, primary insurers, and reinsurers (King et al., 2014). At the end of May 2013, 1,000 days after the first earthquake, only 45 percent of the residential claims were settled (Gates, 2013). Although the funding for repairs will ultimately be available to homeowners the settlement process has been incredibly complicated, not only by the number of events and the apportionment of claims, but also by government decisions to limit development in liquefaction zones and require improved building standards for foundations in large portions of the city.

Land was zoned red (no rebuilding allowed), orange (further study needed), or green (rebuilding allowed) based on geotechnical studies and assessments of where utilities could be replaced. More than 7,000 homes in the red zones were offered a buyout package to leave their unsalvageable houses. The government bought their land (more than 700 hectares, or 2.7 square miles), which is now subject to an increased threat of river and ocean flooding. Another 2,500 homes in the orange zone were on hold for many months, pending further study. The Department of Building

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<sup>2</sup> In 1945, the government established an insurance program to protect its residents from the financial impacts of war. Later, it repurposed this program as coverage for natural catastrophes such as earthquakes, landslides, tsunamis, volcanic eruptions, hydrothermal activities, and floods.

and Housing subdivided the green zone into three subzones. There, 10,000 to 15,000 homes in technical category (TC)3 will require substantial foundation work to be considered habitable. The homeowners in TC3 homes are afraid they will not be able to afford the added cost of complex structural foundation repairs, which are not covered by insurance settlements. They are also concerned they may not be able to sell a TC3 home in the future (Markum, 2012).

TC1 homeowners are free to rebuild according to the basic building code, but TC2 homeowners will have to have foundation plans reviewed. Despite homeowner anxiety, these engineering standards are critical to the city's long-term resilience. They represent a tough but important decision on the part of CERA to enact realistic standards for long-term land use given the effects on land and elevation changes resulting from liquefaction.

In the Christchurch, New Zealand case, the government acted quickly to establish CERA, recognizing the need for national government leadership in a disaster that caused losses of 20 percent of the national gross domestic product (GDP). Although the government was comfortable with the capacity of insurance to fund the housing recovery, no one quite realized how complex administering the staggering number of claims over multiple events with multiple payers would be. The longer timeframe and extra costs (higher repair costs for foundations, higher housing costs for those having to move) are pushing development to the outskirts of the city at the same time that civic leaders hope to entice development back into the downtown area. For residents, the 3- to 5-year wait for payment from insurance claims combined with rezoning and foundation standards are sources of considerable stress. Overall, the country has done remarkably well in organizing a recovery effort and maintaining extremely transparent processes. The Christchurch lesson, however, is that insurance should not be the sole predisaster recovery finance plan.

## **Government Recovery Management in Other Recent Events**

Other nations have had differing approaches to housing recovery. The M7.9 Sichuan earthquake of May 12, 2008, in western China caused extensive damage in a large and remote region, destroying some 5 million homes. As a nation, China has stringent building codes, but regulations in the Sichuan region were less vigorously enforced, resulting in a high death toll. The central government took an active role requiring wealthier eastern provinces to contribute 1 percent of their local GDP for 3 years to the recovery in a program in which damaged cities were twinned with contributors. As is common in China, planning and central management were used to develop new towns and large-scale housing construction sites. The goal of moving families out of temporary housing after two winters meant little time to review building codes, little time to consult impacted residents about their desires or needs, and little environmental review of site selection (Peng et al., 2011).

In addition, no real choice of housing type or location was available to families. China's strong emphasis on expediency may have compromised overall construction quality and limited integration with jobs and social services. Thus, whereas the central government of China focused on a massive and speedy rebuilding program, it lost opportunities for sustainable development and hazards mitigation and opportunities to reduce social vulnerability through coordinated efforts in jobs, health care, and other services. Victims furthermore had little choice in their housing options, and many families were separated because the new housing was not near jobs.

The April 6, 2009 M6.3 earthquake in the Abruzzi region of Italy devastated 49 small towns and the central city of L'Aquila, leaving more than 60,000 people homeless. Within 6 months, the national government built base-isolated housing for 15,000 people on a variety of sites in the region. Intended as long-term temporary housing, the units will be repurposed as student housing after 20 years (Calvi, 2010). Although the effort was critical for many families with no housing options, larger recovery efforts have stalled for lack of funding. Families who did not receive the new housing lived in hotels and coastal towns (2 hours away) for 2 to 3 years, and many have relocated permanently. University students commute 2 hours from Avenzano. After 5 years, some rebuilding has begun on the outskirts of L'Aquila, but it is unclear how the university, the tourist industry, or local business will support the larger community recovery without greater housing stability.

Other examples of strong central government recovery management come from efforts after earthquakes in Turkey (for example, the 1999 Kocaeli and Düzce earthquakes) and in India (for example, the 1993 Maharashtra and 2001 Gujarat earthquakes). In these cases, World Bank funding was channeled through national and state governments to support rebuilding programs (Mukherji, 2011, 2010). Although the finance mechanisms were different, the approaches were similar to those in China and Italy, with heavy investment in replacement units in new developments. Some limited efforts by NGOs engaged small subsets of the affected population in self-building and repair programs.

In nearly all these cases, governments used existing agencies and programs to deliver housing after disasters. Some, as in Sichuan, China, and L'Aquila, Italy, were highly centralized with few opportunities for housing choice or participation in planning by the citizenry, whereas others provided varying degrees of flexibility and housing choice to earthquake victims. For the more recent events, it will be valuable to reexamine the relationship between housing construction and community economic and social stability 10 years after the event to see how the impacted populations have fared.

## **Limited Government Management With Private Investment**

The United States and Japan are similar in their approaches to a more limited role for government in disaster recovery, with a focus on public funding primarily for infrastructure, limited government support for housing and private-sector recovery, and limited disaster insurance for homes.

Although Hurricane Sandy (which devastated portions of New York and New Jersey in October 2012) is now considered the largest U.S. disaster, it is too soon to assess recovery efforts, and it is more useful to review the aftermath of Hurricane Katrina, which devastated New Orleans and the Gulf Coast in August 2005. The damage was distributed over a large geographic area, but New Orleans lost 100,000 units (50 percent of city households) of the approximately 400,000 units damaged across the region. The city did not have enough capacity to provide temporary housing (such as mobile homes and trailers), and many families were evacuated to other cities and states (Olshansky and Johnson, 2010).

Flood insurance did not cover all the storm damage for homeowners who had insurance, because storm surge was not covered, and many homeowners who were behind levee walls did not have insurance because they were not in the designated flood plain. Politics, at all levels of government, hampered government assistance programs. Housing repairs and reconstruction required

substantial private investment, and relatively little low-income and multifamily housing was rebuilt. New Orleans now has about 25 percent fewer habitable housing units than it had before the storm. Since Hurricane Sandy came ashore, similar issues have come up in New York and New Jersey, where public investment in infrastructure will encourage private investment in high-income areas but leave lower income regions with few options for recovery finance.

Japan's March 11, 2011 M9.0 Great Eastern Japan earthquake and tsunami devastated a large coastal region, similar in scale to the region affected in the Chile earthquake. Because of the additional complexity created by damage to the Fukushima Daiichi Nuclear Power Station, housing recovery will go beyond the replacement of disaster losses to include long-term evacuation from undamaged communities affected by fallout. With limited insurance for homes, declining economies, an aging population in coastal fishing villages, and complex social adjustments for nuclear-displaced families, the recovery will be prolonged and require a combination of public and private investment. Coastal planning, similar to that undertaken in Chile to mitigate tsunami hazards, has been completed, but decisionmaking, distribution of funding, and plan implementation are taking place at the central government, prefecture, and local municipality levels without good coordination (Maki, 2012).

Past events in the United States and Japan—the 1989 M7.1 Loma Prieta (San Francisco Bay Area) earthquake, the 1994 M6.8 Northridge (Los Angeles area) earthquake, and the 1995 M7.2 Hanshin-Awaji (Kobe, Japan) earthquake—discussed subsequently—demonstrate the outcomes from a limited government approach to housing recovery.

Some 25 years after the Loma Prieta earthquake, major investments in public infrastructure have brought about the transformation of the San Francisco waterfront (resulting from the demolition of the Embarcadero freeway) and the rebuilding of the San Francisco-Oakland Bay Bridge and of museum, cultural, and civic buildings. The Hayes Valley neighborhood was also revitalized, with the replacement of the damaged Central Freeway with a boulevard design. By contrast, only 75 percent of the total housing destroyed by the earthquake was replaced within 10 years after the event. High-income areas recovered quickly, but many residents of low-income, single-room occupancy hotels and apartments were left homeless after the Loma Prieta earthquake. The time-consuming repair and replacement of these units were carried out largely by nonprofit housing groups, which meant that no additional units of government-subsidized affordable housing were added in the decade after the earthquake (ABAG, 2000; Comerio, 1998).

After the Northridge earthquake, nearly 300,000 owners of damaged single-family homes made claims on their earthquake insurance; repairs required 2 to 5 years to complete. Rebuilding multifamily housing was more difficult. Two-thirds of the 59,000 multifamily units declared uninhabitable required at least 5 years for repairs, and the remaining one-third were abandoned or torn down (Comerio, 1998, 1996). High rental vacancies in the San Fernando Valley and in much of the city of Los Angeles at the time of the earthquake provided families with relocation options, so people were not displaced. The rebuilt apartments typically served newcomers to the area.

In Kobe, some 400,000 housing units were damaged or destroyed. The government provided 48,300 temporary units, which were occupied for 6 to 8 years after the event. A complex planning process involved a variety of land use and zoning adjustments, which were effective but time



consuming, to aid the rebuilding process. The government set a target of 125,000 replacement housing units, of which 38,600 were designated for low-income people. The Phoenix Plan stated that two-thirds of the new units were to be built by the public sector and one-third by the private sector. After 5 years, private-sector housing was being built much faster than public-sector housing, particularly in outlying areas (Olshansky, Johnson, and Topping, 2005; Preuss, 1998). Although the national government ultimately met the overall housing replacement goal, many earthquake victims were displaced, and new housing in Kobe served a gentrified population. Some 10 percent of Kobe's population left the city, and it took 10 years for the population to return to predisaster levels (Maki, 2012).

The United States and Japan are developed nations that make some investment in post disaster housing. Their policies, however, suggest that they are willing to accept a greater reliance on the private sector for disaster recovery, even if that recovery is uneven across income groups. In developing countries, a limited government role in disaster recovery can extend the hardships for disaster victims.

The devastating losses in Port-au-Prince, Haiti, from the January 12, 2010 M7.0 earthquake—in terms of the number of deaths and the physical losses in housing, schools, hospitals, and public buildings—extend to the capacity to manage the country. Haiti lost a significant portion of its weak national government in the earthquake and was already dependent on NGOs for many social services (Farmer, 2011). For any developing country, the losses incurred in natural disasters are in part products of their predisaster conditions—poverty and lack of jobs, education, and training. After a disaster, the problems are often compounded by the unintended consequences of international aid. In Haiti, less than 1 percent of the aid went to the public sector; yet, long-term recovery requires a functioning public sector. An NGO can build a school or a clinic, but the building is of limited use without a public mechanism to pay teachers or nurses.

Only 3 percent of the donor funds were spent on permanent housing (Sontag, 2012), and, as of April 2013, individual households had constructed nearly 10 times as many housing units as had international agencies. Now 4 1/2 years after the earthquake, 172,000 residents are still in tent camps (Konotchick, 2013), and much remains to be done in addition to providing housing, including resolving landownership, developing public services (water, sanitation, education, and health care), providing job training, and developing the economy.

## Comparison of Approaches

When the housing recovery in a variety of countries is reviewed, two metrics stand out: (1) a strong government role in funding, management, and coordination improves housing reconstruction; and (2) more individual choice in housing combined with citizen participation in larger planning processes improves citizen recovery.

The chart in exhibit 3 provides a way to look at the balance between government roles and community participation in various recovery efforts (Comerio, 2012). The placement of each country is based on the author's judgment, but the aim is to represent the variety of approaches used. The



**Exhibit 3**

Comparison of Recovery Management Approaches

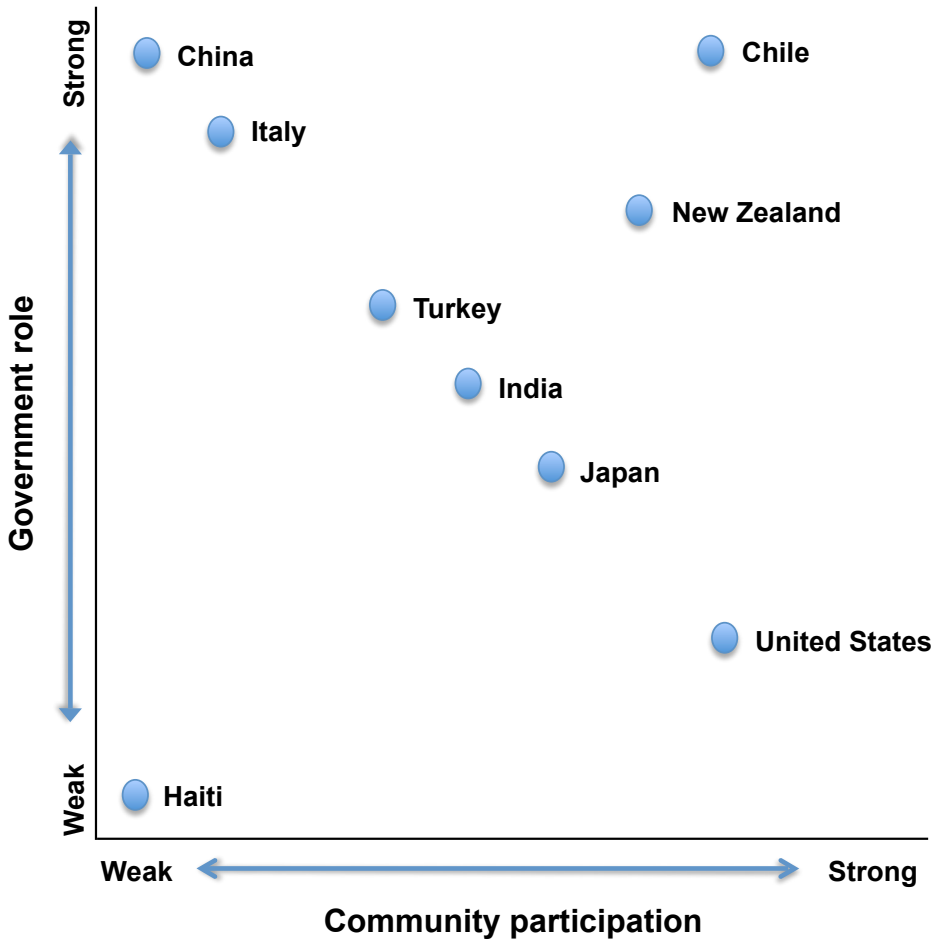


chart shows that Chile and New Zealand have combined both “top-down” and “bottom-up” approaches, providing government leadership and funding along with community empowerment in decisionmaking. It is important to recognize that these approaches are not mutually exclusive and can be combined effectively.

By contrast, China and Italy took strong government leadership roles in providing replacement housing but did not engage local communities in most aspects of the decisionmaking. Turkey and India had mixed programs—with some housing developed by government in large tracts and some village programs in which NGOs worked with residents on self-help construction. The United States and Japan provided strong leadership during the emergency phase and funded some aspects of recovery, such as infrastructure and public facilities, but left most of the housing reconstruction to the private market. Haiti’s weak government and high poverty levels limited recovery from both perspectives.

In the future, countries with major housing losses in a disaster can learn from the experience of others and attempt to find the “sweet spot” that provides the best of government management, for expediency and flexibility, and incorporates opportunities for citizens to take some control over their own recovery, with housing choice and participation in plans for the community’s future. In this regard, Chile’s performance stands out.

## Conclusion

After a disaster, people who have lost homes and all semblance of normal life may be confused, disorganized, and demoralized. They grieve for what was lost. Their needs go beyond physical replacements. People-focused approaches—that is, recovery programs that engage citizens in decisions about the future—have the advantage of empowering these individuals, turning passive into active, turning lack of control into control, and promoting community engagement. Psychiatrist Craig Van Dyke (2012: 1) wrote, “. . .the grief literature describes the endpoint of successful mourning as a point when the individual is capable of making new emotional investments in the future. It is not defined by happiness or even well-being. Rather it is an acknowledgment that one is forever changed, but it is time to get on with life and make new investments and not have one’s personal development permanently arrested.”

A community likewise cannot go back to how things were before a disaster but must adapt and move forward. A few simple lessons emerge from recent experiences that can be useful in coping with a large-scale disaster and extensive housing losses.

1. Disasters create anxiety and opportunity. It takes government leadership—at national and local levels—to manage both.
2. Housing (and funding for all types of housing) is essential to recovery.
3. Government leadership is crucial.
4. Cooperation between the national and local levels of government is important—programs need local input and cooperation to succeed.
5. Existing government programs must be flexible and adaptable to meet postdisaster needs.
6. Recovery takes time to implement. In the first year, it may be possible to fix basic infrastructure, but major urban redevelopment and new civic institutions can take 10 to 20 years.
7. While managing information for citizens in an ongoing effort, a long-term vision helps to explain the realities of construction times and the social and economic recovery goals.
8. Balancing government assistance and individual responsibility, government leadership, and community involvement is essential in all recovery efforts. Postdisaster assistance should enable citizens to recover, not create entitlements.

The U.S. government could improve its disaster recovery programs without a major overhaul of current policies by using the National Disaster Recovery Framework to expand and structure coordination between federal agencies and local governments and to focus on unmet housing

needs. A few examples of specific strategies might include case management for disaster victims, targeting recovery funds for rental and affordable housing, and advancing shelter-in-place strategies and other short-term housing solutions to keep people in their communities. The examples from various nations demonstrate the many ways to manage disaster recovery. Each nation can learn from the experiences of others, however, and develop policies and programs that focus on recovery and community renewal.

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# Design and Affordable American Housing

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## Abstract

*Americans have experimented with new models for affordable housing for more than two centuries. The private sector, public agencies, and nonprofit organizations have all played a role. Architecture and site planning have been crucial elements in these efforts, yet they have received scant attention. In arguing that the design of good housing is neither elusive nor subjective, this article explores some of the best practices—and a few mistakes. The article begins with a historical background of diverse endeavors to provide better, more affordable housing for single women, workers, public housing tenants, immigrants, homeless individuals, and low-income families. It then relates this legacy to recent efforts to integrate housing with community development.*

## Introduction

Given the U.S. history of housing booms and busts and a penchant for novelty, Americans have experimented for more than two centuries with innovations and reforms that promised to produce less expensive, better quality housing for more people. These promises were sometimes marketing ploys or political rhetoric. Public programs have never provided more than 5 percent of total U.S. housing production, and the poorest citizens have often been left out. Nonetheless, the goal of expanding affordable housing has been resonant in the public and private realms, including the fields of architecture and construction.

Builders have pursued ways to economize since the late 19th century. Private philanthropists constructed “model tenements,” hoping to elevate a deplorable building type with simplified designs, public health, and moral uplift. Experiments with neoteric building materials and construction systems sought to reduce production costs. States and municipalities funded cooperatives. The federal government created the first public housing for the unemployed “deserving poor” during the Great Depression—although the main concerns were job creation and support for the private sector.<sup>1</sup>

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<sup>1</sup> A previous federal program was created for shipbuilders during World War I. After an initial effort improved transportation to the shipyards, the U.S. Housing Corporation and Emergency Fleet Corporation committed to build 25,000 units but built only 15,000, then sold them off to private buyers after the armistice.



The Federal Housing Administration's (FHA's) financial supports for suburbanization joined post-World War II (WWII) shelter magazines in promoting small, visibly modern "economy houses" for suburban working- and middle-class families—if they lived in White neighborhoods (Harris, 2013).<sup>2</sup> Addressing the assisted low-income housing stock, President Lyndon Johnson's 1968 task forces on urban poverty and violence lambasted the shortage of good subsidized housing, yet resolutely condemned modern highrises (NCUP, 1968).

These efforts ground to a halt with President Richard Nixon's 1973 moratorium on housing and community development assistance. When federal funding for housing was reinstated, it focused principally on vouchers for private developers. New assisted housing production never again approached the level of the early 1970s. Design innovations persisted in very local and transgressive ways, however, as religious groups and community design corporations built small-scale "contextual" enclaves. By the 1980s and 1990s, urban activists had formed coalitions based on housing issues as varied as gentrification, job training, and historic preservation.

Architecture is a crucial element in achieving good housing, yet it usually plays at best a minor role in deliberations about cost and value.<sup>3</sup> This contradiction stems in part from fundamental misconceptions. Architecture is not a matter of taste or mere aesthetics. Design quality is crucial to good affordable housing. The skillful organization of interiors, views, public areas, outdoor spaces, and even facades is especially important when budgets and square footage are at a premium (Davis, 2004; Feldman and Koch, 2004; KEA, 2006).

As many practitioners and scholars have documented, good design is not elusive or subjective.<sup>4</sup> Four themes characterize the best practices, whatever the era, scale, aesthetic, or auspices.

1. The direct involvement of residents encourages better design. Diverse groups have asserted their distinctive needs and preferences, sometimes challenging the architects' priorities and the power of cultural norms.
2. Focused research helps designers explore alternative technologies and strategies that lower costs, set design guidelines, increase residents' satisfaction, and spur innovation.
3. Site plans are more significant than architectural styles. They orchestrate the natural environment, of course, but they also affect safety and social life, both planned and serendipitous, for residents of all ages.
4. Good site planning extends from adjacent buildings to the entire metropolitan region. People in affordable housing often need nearby jobs, shopping, transportation, childcare, good public schools, parks, cultural activities, health facilities, counseling, and other supportive services. As Xavier de Souza Briggs puts it, "*Neighborhoods* can matter (as locations) even when *neighbors* do not" (Briggs, Popkin, and Goering, 2010: 20).

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<sup>2</sup> Concerned about potential risks to the financial value of the properties it insured, FHA guidelines opposed racial integration—and modern architecture.

<sup>3</sup> One study estimated that planning and design affect 70 percent of the cost of a new building (Davis, 1995).

<sup>4</sup> The Affordable Housing Design Advisor website (<http://www.designadvisor.org>) helps nonprofit organizations set goals and strategies. The website is jointly sponsored by HUD and the New Jersey Institute of Technology.

These positive attributes have often confronted three negative tendencies that disguise and disparage the need for affordability.

1. Builders and consumers indulge in architectural extravagance as if it can express individuality, ensure autonomy, and increase property values. Post-Civil War Victorian dwellings first professed these values, belying the widespread use of mass-produced ornament. The supersized McMansions festooned with supersized decor that first appeared in the 1980s continue this tradition.
2. Many Americans mythologize the market and look down on those who need assistance as failures. In this scenario, the middle class resents “entitlements” or “handouts” as special benefits for poor citizens. It condemns public housing in particular as a path to a welfare state and the worst of modern design.<sup>5</sup> This sentiment persists despite the fact that tax deductions provide far more support for middle-income and upper income homeownership than assisted housing investments provide for poor and working-class citizens.<sup>6</sup>
3. Homeownership has been depicted as the ideal affordable housing strategy for low-income households, even though mortgage financing terms have always been risky for those with moderate incomes (Mason, 2004). Renting often provides more flexibility, more mobility, and reduced costs; yet government agencies and the White House have focused intently, sometimes exclusively, on homeownership, especially since the first GI bill of rights at the end of WWII (for example, Bush, 2002; HUD, 1991, 1984). In fact, major developers and financial institutions have been the principal, albeit not the only, beneficiaries of these neoliberal programs (Hays, 2012).

Together, these trends perpetuate two cultural beliefs about design and housing: (1) that it is simply a matter of aesthetic preferences, and (2) that the benefits of good design should be reserved for those who can afford them. All too often, these attitudes have resulted in assisted housing that is cheaply built and banal, even depressing (Bauer, 1957; Schwartz, 2006). Given the frustrations, many professionals eschew this kind of work, although talented and dedicated architects have designed outstanding low-income housing. The originality and quality of their assisted housing are often superior to those of market-rate housing.

This article provides vignettes in the evolution of American affordable housing design and construction as produced by the public, private, and nonprofit sectors. I focus on the role of design—a topic that receives scant attention, except among architects and planners—in contributing to specific advances, but I avoid claims that design can definitively solve complex problems. As an optimist and a historian, I want to understand mistakes in the past but also to take heart from a legacy of ingenuity and innovations that sought to improve America’s housing.

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<sup>5</sup> The 1968 National Commission on Urban Problems blamed urban riots and the problems of public housing highrises on Le Corbusier and his theories of “towers in a park” (NCUP, 1968: 123), a sentiment echoed in the President’s Committee on Urban Housing (Kaiser Committee, 1969). The National Public Housing Museum, which recently opened in Chicago, gives a favorable counter-narrative of the ambitions and achievements of tenants who went on to become successful.

<sup>6</sup> Mortgage interest and property tax deductions represented more than \$181 billion in fiscal year 2009—more than four times the amount that went to low-income rental housing. Because homeowner tax deductions are based on the financial value of dwellings, the greatest benefits go to middle-class and wealthy households.

## Residents' Needs

The structure of the article follows the four themes regarding design's role in affordable housing. To examine design as a strategy for realizing residents' and community needs, I begin with brief histories of two groups that generated niche markets for moderate-cost housing.

### Affordable Housing for Women

By 1910, nearly one-third of the nation's female urban population lived alone or with other women, "adrift" to some observers, "self-sufficient" to others (Meyerowitz, 1988). Because their wages were much less than those of men, most independent women wanted housing that was affordable, efficient, and conducive to sharing a congenial social life. Apartment hotels for the elite and boarding houses for working women provided two approaches (Groth, 1994). In an article for *Cosmopolitan*—then a very different magazine for women—the feminist Charlotte Perkins Gilman praised the centralized cooking, dining, housecleaning, childcare, and other domestic tasks (Gilman, 1972).

Architects and builders also experimented with small bungalows, often grouping them together around a courtyard to encourage social life and downplay the diminutive size of the dwellings. A new arrangement appeared in the 1920s, also called bungalow courts but consisting of small-scale apartment buildings around internal courtyards (Polyzoides, Sherwood, and Tice, 1992). Behind fanciful historicist facades were small one-bedroom units and novel "efficiency studios" with kitchenettes. Variations of both housing types proliferated throughout California, the Pacific Northwest, and the Midwest. This tradition is a precedent for the microunits (or "millennial housing") now appearing in New York and California.

By the 1970s, the divorce rate had doubled and one-third of divorced women did not remarry. More than one-half of the country's married women worked outside the home, including those with young children. Meanwhile, the size and cost of new single-family houses had increased dramatically. These demographic and architectural changes encouraged a shift to clusters of lowrise, high-density townhouses (Montgomery, 1977). The term "multifamily" now encompassed multiple kinds of living arrangements.

The proverbial "typical household" accounted for only 15 percent of the population in 1980, and officials were especially concerned that the number of single mothers had increased dramatically. Racial prejudice intensified the opprobrium, because the upsurge was greatest among African-American mothers.<sup>7</sup> *Housing Our Families*, a 1980 U.S. Department of Housing and Urban Development (HUD) study, lamented what it called "broken families" but acknowledged how little was known about them (Smull, 1980). Thus, single-family homes remained a sanctified ideal, protected by strict zoning regulations, popular media, and government agencies.

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<sup>7</sup> Daniel Patrick Moynihan published his controversial book, *The Negro Family: The Case for National Action*, in 1965. A prominent sociologist and Assistant Secretary of Labor, Moynihan contended that high unemployment and the rise in African-American single-parent families (then about one-fourth of the total) was caused in part by social attitudes and social welfare policies that discouraged young African-American men from a sense of responsibility as fathers (Moynihan, 1965). Vilified as a racist tract at the time, the Moynihan Report now seems prescient. The Urban Institute published *The Moynihan Report Revisited* in 2013. The current number of White single mothers is approximately the same as the number of African-American single mothers in 1965; the number of African-American single mothers has tripled (Acs et al., 2013).

The 1980s saw feminists emphasize the need for transitional housing with temporary social services for women who were abused, homeless, or at risk (Birch, 1985; Sprague, 1991). The shelters were intentionally traditional in appearance to emphasize continuities. Denver, Boston, and other cities endorsed such “bridge housing,” but communities were often resistant, fighting changes in local zoning regulations. This variety of spaces is a reminder that the United States has always had many kinds of domestic architecture and living arrangements, but market fears and social stigmas still limit the range of alternatives, despite ever greater social diversity (Coontz, 1992).<sup>8</sup>

## **Workforce Housing**

Housing costs rose rapidly after World War I. Milwaukee, Philadelphia, and the state of New York, concerned that workers could no longer afford to live in their cities, passed legislation that encouraged nonprofit cooperatives to build moderate-cost group housing (Sazama, 2000). The quality of construction had a special appeal for labor unions, which appreciated artisanal skill. The Amalgamated Clothing Workers of America in New York City built two projects in the late 1920s that featured handsome brickwork. Most future residents petitioned for childcare facilities and activity rooms. Local 3 of the International Brotherhood of Electrical Workers added a convivial bowling alley to its group housing development, Electchester, in Queens, New York, in the early 1950s.

New Deal agencies helped American unions sponsor significant projects. A highlight was the Carl Mackley Houses in northeast Philadelphia, completed for the American Federation of Hosiery Workers in 1935 under the Public Works Administration (PWA). The recent immigrant Oskar Stonorov developed an initial model based on German modernist *Zeilenbau*, or rigid diagonal slabs, but never showed it to the union officials, realizing they would find it too severe. Stonorov and his partners shifted to irregular, three-story blocks that rise and fall with the gently sloping site, punctuated by passageways, balconies, and small recessed spaces around stair landings. Even the color softened with inexpensive industrial tiles in rich autumnal hues, evoking Philadelphia’s brick rowhouse vernacular. Although the unit sizes were small in all PWA projects, generous public amenities included playgrounds, auditoriums, meeting rooms, nursery schools, rooftop laundries, underground garages, and swimming pools.

The cost of urban living has again created a need to provide affordable housing for many kinds of workers. Universities, schools, and hospitals took up the initiative decades ago. Municipalities throughout the country now sponsor mixed-income, mixed-use housing, often as infill in gentrifying historic areas (Brennan and Lipman, 2007; Rosan and Thoerig, 2012). Private and nonprofit developers receive abatements and bonuses when part of a site (20 to 50 percent) is set aside for moderate-income households. Good design is a key tool for making these investments attractive to occupants with diverse incomes. Distinctions among the different kinds of units are not immediately visible from the hallways. Street facades now tend to feature striking modern surfaces rather than neotraditionalism. The quality and amenities of common areas are especially important. Design interventions also extend beyond housing into community development. For example, adaptive reuse can sustain existing businesses while adding new retail and light industry to expand the local job base.

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<sup>8</sup> Anthropologist George Murdock coined the term “nuclear family” in 1949 (Boudreaux, 2011).

In sum, innovative design strategies have partially filled the housing needs of single women, workers, and other groups. Some successes have relied on governmental officials and more anomalous groups working closely with residents. The early successes predated strict zoning regulations about traditional norms of family life and conventional housing finance—an openness that is again necessary.

## Research and Affordability

American research in affordable housing has taken two directions: (1) experiments about construction systems and building materials, and (2) social-science studies about the residents' attitudes toward their surroundings.

### Prefabrication

Factory production of all or part of housing construction has enjoyed a cult status among Americans who hope that standardization and rationalization can reduce prices by producing houses like cars. Sears, Roebuck, & Company shipped plans and precut materials for nearly 100,000 “kit houses” between 1908 and 1940. Frank Lloyd Wright used the same principles to create much more elegant mail-order houses for the American System-Built Company in Milwaukee between 1915 and 1917.<sup>9</sup> Meanwhile, Grosvenor Atterbury developed a pioneering system of concrete panels for workers' housing in Forest Hills, New York. He then covered the facades with neo-Tudor ornament so the attached houses would look more homelike (Bergdoll and Christensen, 2008).

Universities conducted research on industrialized housing in the 1920s, as did *Architectural Record* magazine. Government housing for war workers then explored fast-track construction, new materials, engaging site plans, and onsite services like childcare and health clinics (Wright, 2008). Postwar architects, builders, and industries used this legacy in collaborating on the design and production of affordable dwellings now prized as “mid-century modern.” They investigated plastics, aluminum, plywood, steel, and other atypical materials. If square footages were small, the open plans gave a sense of spaciousness, often extending to an outdoor patio or balcony.

Two new magazines endorsed affordable housing. *Arts and Architecture* in southern California created its Case Study House Program to highlight prefabrication's design potential. A 1949 house by Charles and Ray Eames was an exuberant juxtaposition of different inexpensive, off-the-shelf materials. High-end design trumped feasible models, however (Smith, 1989). *House and Home*, launched in 1952, addressed home builders. Articles urged hiring—or simply borrowing from—high-quality site planners and architects like Frank Lloyd Wright for moderate-cost housing (Anonymous, 1953). The editors also advised readers to eschew narrow FHA standards for design and livability.

George Romney became Secretary of HUD in 1969. The former American Motors Corporation executive vowed to industrialize American housing within a decade. The result, Operation Break-through, produced only 25,000 units on 22 demonstration sites, all under management experts

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<sup>9</sup> Two decades earlier, in 1895, Wright designed two low-income housing projects in Chicago, Francisco Terrace and the Waller Apartments, for the developer-philanthropist Edward Waller.

and engineers (some from the Department of Defense) rather than designers. Largely completed in 1974, the program was considered a failure in the 1976 evaluation (GAO, 1976). Prefabrication nonetheless continues to be promoted as a means to achieve affordable housing today.

## **Social Scientists Evaluate Affordable Housing**

Social scientists had taken on a new role by mid-century: that of explaining why certain housing was successful—or not. The first studies of the 1950s condemned the destruction and displacement, or “urban renewal,” explaining that social communities can be meaningful even when the area is not physically appealing to outsiders.<sup>10</sup>

Then came diatribes against highrise public housing—with Pruitt-Igoe in St. Louis, Missouri, as the totemic example. Catherine Bauer, who helped write the original United States Housing Authority legislation in 1937, lambasted the slipshod construction standards, barren and frightening sites, urban policies that isolated and warehoused poor citizens, and the lack of innovative or attractive design (Bauer, 1957). “The Pruitt-Igoe Myth,” Chad Freidrichs’ recent film, showed that residents had first been delighted with the great improvements from their previous homes but grew angry about the deplorable lack of security and maintenance (Bristol, 1991; Freidrichs, 2011).

Elizabeth Wood, who was ousted as director of the Chicago Housing Authority (CHA), joined the Citizens’ Housing and Planning Council of New York in 1956 and still espoused a sense of possibility for highrise public housing. Wood called for site designs that provided “richness and imagination”—plus tenant management.<sup>11</sup> Her astute observations noted teenagers’ need for places to loiter and young mothers’ desire for social contacts. Anticipating recent research, she contended that, although a few “problem families” do cause most of the difficulties, housing administrators should give them extra support (Wood, 1961, 1959).

Clare Cooper Marcus, now professor emeritus in the Departments of Architecture and Landscape Architecture at the University of California, Berkeley, studied “user needs” in subsidized housing, with an emphasis on site plans and what came to be called “identity.” Her interviews established a hierarchy of needs among the residents: shelter, social life, comfort, and self-expression. This research generated an extensive compendium of design guidelines (Cooper Marcus, 1975; Cooper Marcus and Sarkissian, 1986). Franklin Becker, a Cornell University sociologist, documented the widespread preference for lowrise housing with varied massing, balconies, and distinctive roofs. The New York State Urban Development Corporation used Becker’s field research as a tool—or perhaps simply a validation—for more than 100 affordable housing projects across the state (Becker, 1974; Buscada, 2005; IAUS/UDC, 1973).<sup>12</sup>

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<sup>10</sup> See, in particular, Davies (1966), Gans (1962), Jacobs (1961), and Rainwater (1970).

<sup>11</sup> Wood’s 1961 book is especially compelling because, as the first director of CHA, she had previously endorsed superblocks of modern highrises, convinced that large-scale enclaves would help residents avoid “contamination” by the poverty of their surroundings. Wood was forced to leave CHA when she insisted that the authority integrate all its housing.

<sup>12</sup> Founded in 1968, the New York State Urban Development Corporation (UDC) was charged with building subsidized housing to stem urban decay, especially in New York City’s outer boroughs. Free of many restrictions, major architects designed highrises and cluster developments. Despite the good intentions, many of the projects unfortunately had a devastating effect on mixed-income communities. In 1975, facing bankruptcy, UDC reorganized and switched to economic projects like Battery Park City, Roosevelt Island, and the Javits Convention Center. In 1995, seeking to put its negative history behind it, it was renamed the Empire State Development Corporation.

Oscar Newman's 1972 book, *Defensible Space*, offered a facile analysis, insisting on a causal correlation between building height and criminal activity (Newman, 1972). Newman's ideas presumed suspicion and territorial control in addition to more legitimate needs for residents' surveillance—what Jane Jacobs had previously called “eyes on the street” (Jacobs, 1961). Although simplistic, Newman's theory became extremely popular.<sup>13</sup> In sum, this collective body of work influenced designers' thinking about residents' needs in assisted housing facilities, sometimes in contradictory ways. If some architects resented popular preferences and elaborate guidelines, they also learned to question their own presumptions about what people need and want.

## Site Plans

St. Francis Square in San Francisco, completed in 1964, exemplifies the benefits of good site planning. The International Longshoremen's Union sponsored this cooperative, the first affordable housing in the San Francisco Redevelopment Agency's Western Addition Redevelopment Project Area (Cooper, 1971). The architects, Marquis & Stoller, softened the simple wooden facades of three-story family units by working with landscape architect Lawrence Halprin to create three generous courtyards, further differentiated into seven groups. The irregularities of the site give a varied cadence up and down hillsides, and balconies provide opportunities for families to personalize their units. St. Francis Square immediately began to win design accolades, becoming a prototype for market-rate and social housing throughout the country. Subsequent observers were concerned, however, that this “garden housing” did not engage the street. Focusing inward on courtyards, residents are cut off from nearby neighbors, and passers-by, unable to see in, feel disconnected.

Villa Victoria in Boston's South End provides a more open and complex site plan. Success took more than two decades, accentuating the perseverance of the Puerto Rican residents who were first threatened with eviction because of urban renewal plans in 1960. “Victorious Dwellings” finally broke ground in 1970, continuing in six stages through 1982 under the architect John Sharratt. Various HUD programs funded mixed-income housing (a highrise for elderly people, new and renovated duplex townhouses, and a midrise building), commerce, parks, and a public plaza that evokes Puerto Rican design. The streets keep through traffic to a minimum, allowing for a pedestrian spine that connects the plaza to a playground (Rowe, 1993).

HOPE VI was far less nuanced and progressive in its concepts about site plans and community engagement. The program originated in 1992 as HUD's effort to demolish what it deemed severely distressed public housing. Officials drew on Newman's *Defensible Space* theories to condemn *all* highrises (Cisneros, 2009, 1995). New Urbanism provided an architectural model of privately owned, small-scale, neotraditional row houses.

Design is relevant to several criticisms of HOPE VI. In particular, the combination of mixed incomes and low densities has meant a substantial net loss in subsidized housing units, especially

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<sup>13</sup> HUD took up these ideas under Secretary Henry Cisneros. *Defensible Space: Detering Crime and Building Community* was published in 1995.



for those most in need.<sup>14</sup> Many architects castigate New Urbanism's suburban mythology as excessively nostalgic, insisting on the need for shared public spaces and higher densities in cities. HUD has also been accused of instituting vague standards, lacking data about the results of HOPE VI projects, and awarding grants based on an area's ability to generate market-rate income rather than the actual state of the project in question (Gilderbloom, 2008; NHLP, 2002). HUD's Choice Neighborhoods program, which essentially replaced HOPE VI, is in part a response to these issues. It goes beyond housing to improve education, health care, and the public transportation that gets residents to jobs.

## **Next Door and Beyond**

Housing is always part of a broad geographical and social setting. The context of affordable housing also responds to the complex histories of the entities that have produced it. This responsiveness to context is certainly true of the rise of nonprofit Community Development Corporations (CDCs) as affordable housing advocates. CDCs emerged during the turmoil of the 1960s, in response to a broad set of social ills (Pierce and Steinbach, 1987). Their numbers increased with the Community Development Block Grant, or CDBG, program of 1974 and backing from the Ford Foundation. Mayors and governors lent support in the mid-1980s, realizing that Washington would never build the affordable housing they needed. CDCs have become more numerous and more active in national legislation like the Low-Income Housing Tax Credit, or LIHTC, Program (Erickson, 2009; Vidal, 1992). By 2010, 4,600 CDCs produced an annual average of 96,000 housing units, 7.41 million square feet of commercial space, and 75,000 jobs (Democracy Collaborative, 2013).

Today's CDCs often work as a consortium, aware that multiple factors are necessary to sustain strong neighborhoods. They increasingly turn to design interventions as critical supports that connect affordable housing with other issues such as employment, urban revitalization, education, historic preservation, and health care. This section looks at contemporary affordable housing built by nonprofit organizations that focus on design's role across a variety of community issues.

First, design can help address community concerns regarding jobs and economic development. Space for various kinds of retail mix—with small-scale workshops, job training, youth programs, and opportunities for startups—have been physically and socially integrated into residential space. Farmers' markets and small grocery stores provide healthy food and ethnic products. Michael Pyatok's Hismen Hin-Nu Terrace in Oakland, California, combines these elements (Jones, Pettus, and Pyatok, 1997). Such examples occur despite governmental regulations that often restrict the amount of nonresidential use on a housing site and prohibit home-based businesses.

Urban blight is another community concern that design can address. Sites for low-income housing are often abandoned or rundown urban areas where rehabilitation has a positive effect on foot traffic and community aesthetics. For example, Daniel Solomon's systems of alleys, walkways, and paths connect with the surroundings in his Los Angeles Vermont Village Plaza project, for

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<sup>14</sup> During its 15 years, HOPE VI demolished more than 96,000 units of public housing and built only 56,000 units affordable to the lowest income households. Slightly more than 10 percent of the public housing tenants have returned to HOPE VI projects.

which his design firm received an American Institute of Architects (AIA)/HUD Secretary's Award for Mixed-Use, Mixed-Income Housing in 2000. Koning Eizenberg Architects (KEA) received an AIA/HUD award for the Waterloo (2002) in Los Angeles. KEA likens the intriguing pattern of its courtyards and connectors to a Sudoku puzzle (KEA, 2006).

Improving educational access and attainment is certainly a key priority of many low-income housing developers. Childcare services, provided on site in many housing developments, often include other children in the neighborhood to strengthen ties. Educational programs for young adults seek to encourage concentration and emphasize ties to a larger youth culture. David Burney, former head of design for the New York City Housing Authority, commissioned an inspired set of libraries and other community buildings to facilitate such services. Each building's uniqueness enriches both pride and connection.

Historic preservation of local cultural assets has recently become a major strategy for affordable housing. It also promotes sustainability and enhances community life (Rypkema, 2002). For example, rather than demolish Archer Courts, a dilapidated 1951 CHA project in Chicago's Chinatown, a local CDC hired Landon Bone Baker Architects. Renovations focused on the interiors and elevators, an open-air corridor was replaced with a glass curtain wall, and extensive landscaping included pavilions for meditation and Tai Chi. Each design intervention improved services and respected the residents' cultural lives. New York's Common Ground Community H.D.F.C., Inc., recently rehabilitated the Andrews Hotel on the Bowery for men at risk of becoming homeless. Like flophouses a century ago, it provides temporary, inexpensive places to live, now combined with supportive services.

Design and preservation can even help integrate mental health supportive services into housing. Many cities have followed San Francisco in protecting their stock of single-room occupancy (SRO) hotels, now recognizing that the wholesale destruction of SROs during the 1970s aggravated the massive increase in homelessness (Rosen and Sullivan, 2012). Community and mental health services are also more effective if they are based locally (Achtenberg, 2002). The Housing Act of 1990<sup>15</sup> focused on special needs populations such as elderly people, disabled people, and people with acquired immune deficiency syndrome, or AIDS. Recent studies show that local supportive services can radically decrease hospital stays and in-patient mental health treatment, particularly when these services are near residential sites (Proscio, 2000). The facilities are most effective if they are easily accessible but also discrete, rather than labeling people in terms of their problems. Conscious of this connection, many CDCs are integrating services seamlessly in development layouts.

Health and natural environments have become recent themes in affordable housing design, too (Burlinghouse, 2009; Meck, 2003; Wells et al., 2007). When New York City sponsored a competition to design and develop affordable housing on a former brownfield site in the South Bronx, the winner was Via Verde ("The Green Way") (Kimmelman, 2011). Prospective residents told the architects they wanted a healthy place to live. A fitness center and medical clinic on the ground floor encourage this goal, cross-ventilation discourages air-conditioning, stairways with windows get people walking, gardens grow fruits and vegetables, and green roofs provide abundant sunshine

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<sup>15</sup> *The Cranston-Gonzalez National Affordable Housing Act*, Public Law 101-625.

and fresh air. The materials used, like ceramics and bamboo, are renewable and do not add noxious compounds to the air. Even the pattern of balconies, sunshades, and rain screens provides visual delight in addition to protection from the elements.

Finally, residential amalgams are becoming increasingly complex and nuanced. In 2008, Hamlin Ventures LLC invited Common Ground founder Rosanne Haggerty to collaborate in developing a downtown block. The Schermerhorn—a homeless shelter that includes the Brooklyn Ballet School—stands alongside 13 luxury townhouses (and subsequently 9 more) that quickly sold. Good design and planning can enhance value for multiple kinds of side-by-side housing.

## **Conclusion**

Secretary of Housing and Urban Development Shaun Donovan was head of New York's Department of Housing Preservation and Development when Via Verde was selected. Donovan has said he wants this prototype to help expand the criteria for affordable housing with a new place-conscious federal policy that defines sustainable neighborhoods in terms of good transportation services, healthy and safe environments, social and economic diversity, and easy access to supportive services (Donovan, 2010). These ambitious goals usually mean doing more with less—then doing it with verve. Past practice has shown that, even when costs are higher than the norm, ambitious non-profit sponsors and their architects respond to constraints with innovations and variations. The private market rarely allows for such experimentation. The accomplishments often reverberate, eventually affecting market-rate housing.

The impressive social and architectural innovations this article addresses take us back to Catherine Bauer. Her pointed critiques of the poor standards in public housing in the 1950s extended to a broad-based vision of affordable urban and suburban housing. Her focus was international in scope, but Bauer saw a risk in architecture that imitated European prototypes. She advised policymakers and architects to move between two somewhat contradictory trajectories in American culture, both of which should play a role in affordable housing: “the line of rational investigation” and “the whole broad history of mass emotion and popular desire” (Bauer, 1934: 253). Today, 80 years later, we still need that mix.

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# Bringing the Power of Design to Affordable Housing: The History and Evolution of the Affordable Housing Design Advisor

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## Abstract

*The Affordable Housing Design Advisor (Design Advisor) is an online capacity-building tool designed to help developers, sponsors, and users of affordable housing understand what constitutes good-quality design, why it is worth striving for, and how to achieve it in their own projects. The Design Advisor was created by the U.S. Department of Housing and Urban Development and launched in 2001. This article describes the history and evolution of the Design Advisor through the intervening years, ending with the upgrading and relaunch of the tool in 2013.*

## Introduction

Decent, affordable housing is critical to the social and economic well-being of the United States. The need for such housing continues to far outstrip demand, and those projects that do get built suffer from severe cost constraints. Good-quality design—too often considered an expensive amenity, rather than a cost-effective necessity—is usually one of the first components cut from a project in the name of cost containment. The result is a country dotted with projects that meet minimal shelter requirements but fall far short of the well-planned, well-designed, and well-landscaped environments usually associated with good-quality housing.

Good design, however, can be the critical difference between an affordable development that succeeds—one that satisfies its residents and neighbors, enhances the community where it is built, and continues as a stable part of that community for decades—and one that does not. In fact, good design may be the most viable strategy currently available to improve the quality, asset value, and acceptance of affordable housing. The funds available for housing development are not likely to

rise, land acquisition and construction costs are not likely to fall, and regulations restricting affordable housing development are not likely to become less burdensome. In the face of these constraints, better design may be the one option left for cost-effectively improving the overall quantity and quality of affordable housing in the United States.

Aware of the potential for better design to significantly improve affordable housing in the United States, the U.S. Department of Housing and Urban Development (HUD) determined in late 1999 that the affordable housing community had a clear need for straightforward, easy-to-use guidance on how to achieve cost-effective design excellence. To address this need, HUD initiated a project to create a new tool that would help improve affordable housing design literacy in the United States. The result was the Affordable Housing Design Advisor (hereafter, the Design Advisor).

The remainder of this article recounts the history of the Design Advisor, its evolution since its launch, its current status, and where it—and the role of good design in community development—may be headed in the future.

## The Affordable Housing Design Advisor

The Design Advisor is a web-based tool designed to help developers, sponsors, and users of affordable housing understand what constitutes good-quality design, why it is worth striving for, and how to achieve it in their own projects. Based on real-world experience and case studies of successful developments from all over the country, the Design Advisor, when originally launched, included the following key sections.

- **20 Steps to Design Quality** is a systematic, detailed procedure for making sure that excellent design is built into every step of the development process.
- **The Project Book** is a design-focused workbook that provides a simple, effective way to manage the development process to achieve the highest possible levels of design quality.
- **The Design Considerations Checklist** is a practical guide to understanding and ensuring that a series of key issues—those with the greatest potential to affect design quality—are considered from the earliest phases of the development process and that no opportunities for achieving design excellence are overlooked.
- **The Gallery** is a collection of outstanding, well-designed affordable housing developments from all over the country, with photos and detailed information on each project.

HUD developed the Design Advisor in cooperation with the following organizations.

- American Institute of Architects (AIA).
- Enterprise Community Partners (Enterprise).
- Federal Home Loan Bank (FHLB) of Boston.
- Local Initiatives Support Corporation (LISC).

- National Congress for Community Economic Development (NCCED).
- Neighborhood Reinvestment Corporation (NRC).

These organizations served as the formal advisory group for the tool and provided valuable input throughout the course of its development and deployment.

The Design Advisor is administered and maintained by the Center for Building Knowledge at the New Jersey Institute of Technology in Newark, New Jersey. It can be accessed at <http://www.designadvisor.org>. Exhibit 1 shows the original look of the Design Advisor.

## Exhibit 1

### The Original Affordable Housing Design Advisor Homepage

**AFFORDABLE Housing Design ADVISOR**

WHAT Gallery | WHY Steps | HOW Checklist | TOOLS Update

### Welcome to the Affordable Housing Design Advisor

If you're part of the solution to America's critical affordable housing challenge, this site is for you. The Affordable Housing Design Advisor brings together experience and ideas from successful affordable housing projects all over the country, and the people who developed, designed and built them.

Good design can make a world of difference for the people who will live in the affordable housing you help build, and for the neighborhood surrounding it. The Affordable Housing Design Advisor is here to help you at every step.

- [Quick Guide to Using This Site](#)
- [Brought to You By](#)
- [Credits and Kudos](#)

#### WHAT is good design?

The essential tests of good design in affordable housing, plus a short course in design fundamentals.

#### WHY is good design important?

Making the case for the value of good design in affordable housing.

#### HOW to achieve good design

Step by step through the process of designing and delivering great affordable housing, from the people who've done it.

#### DESIGN CHECKLIST

Key ideas and strategies for achieving design excellence, with hundreds of drawings and photographs showing how it's done.

#### GALLERY

Designing excellent affordable housing isn't easy, but it's definitely been done. Ideas, inspiration and know-how from around the country.

#### NEW TOOL Demystifying Density

What is density? What does it look like? How can it benefit your neighborhood? Follow this link for two new lectures on the benefits of compact housing.

**Developed by:**  
The U.S. Department of Housing and Urban Development

**In cooperation with:**  
The American Institute of Architects  
Enterprise Community Partners, Inc.  
The Federal Home Loan Bank of Boston  
The Local Initiatives Support Corporation  
The National Congress for Community Economic Development  
The Neighborhood Reinvestment Corporation

**BRINGING THE POWER OF DESIGN TO AFFORDABLE HOUSING**

*Bringing the power of Design to affordable housing.*

## Launch, Promotion, and Expansion (2001 and 2002)

The Design Advisor launched in early 2001. HUD and the other members of the advisory group promoted it through announcements in newsletters and on the websites of the advisory group and via a broad series of presentations, workshops, and training events designed to inform community development organizations and personnel about the Design Advisor and how it could be used in their own affordable housing developments.

These promotional activities were national in scope, ranging from regularly scheduled training events by LISC, NRC, Enterprise, and the AIA to 1- or 2-day workshops for state and local organizations like the Vermont Housing & Conservation Board and the Community Development Commission of the County of Los Angeles. Based on audience responses and the degree of interest in the Design Advisor expressed at all the promotional events, the Design Advisor was well received. Many workshop participants reported that the issue of design was often confusing, if not intimidating, to them. They therefore welcomed a new tool that could help them better understand what good design is and guide them on how to manage the development process to ensure a better designed outcome.

During this early period, the Design Advisor was also expanded to include a new module titled “Demystifying Density.” Created with support from the Fannie Mae Foundation, the module was developed to address what was then—and is still today—a hot button topic in community development by explaining the value of higher density housing and, in the process, helping to correct some of the myths that often underlie NIMBY (not-in-my-backyard) responses to affordable housing developments.

The new module consists of nine short lectures presented by Tom Jones, a nationally recognized expert in housing density and its effects on community development. The first three lectures—an “Introduction to Density”—provide the definition, history, and benefits of density. The next six present a series of “Strategies for Creating Higher Density Housing,” organized by housing type (exhibit 2).

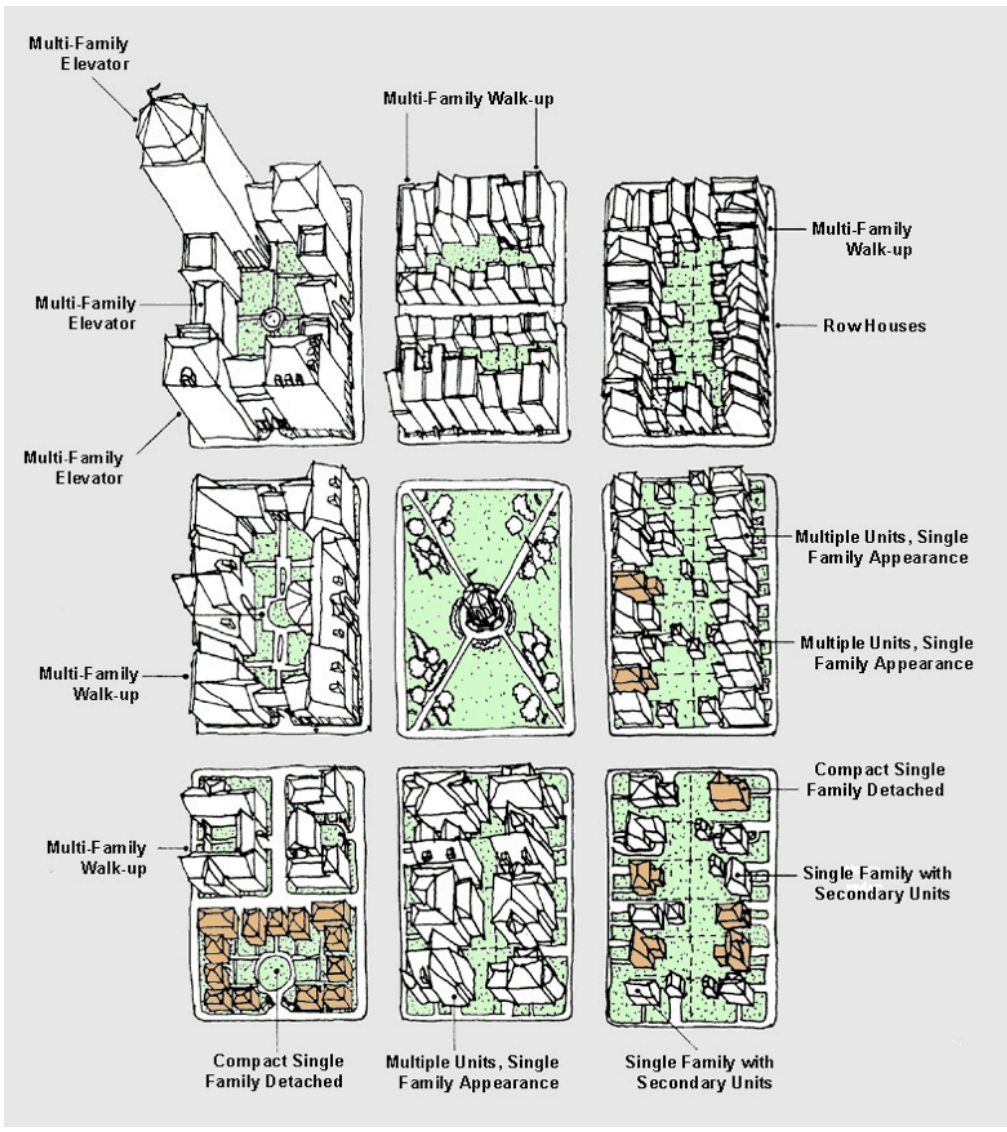
1. Compact Single Family Detached.
2. Single Family with Secondary Units.
3. Multiple Units, Single Family Appearance.
4. Row Houses.
5. Multi-Family Walk-up.
6. Multi-Family Elevator.

One key objective of the lecture series, as the name implies, is to demystify what density looks and feels like. Another objective is to illustrate how relatively high levels of density can—through good design and by paying attention to the characteristics of different housing typologies—be accommodated in what appear to be low-density developments.



## Exhibit 2

### The Demystifying Density Module



The density lectures are in the form of streaming online video presentations. They are accompanied by a comprehensive set of Microsoft PowerPoint slides that users can download to create their own presentations. Together, the lectures and the slides are intended to serve as a powerful advocacy tool that any stakeholder in the community development process can use to argue persuasively for the value and benefits of higher density affordable housing.

## Evaluation (2003)

After the Design Advisor had been deployed for roughly 2 years, HUD funded an evaluation of its progress and current status. The study, *Bringing the Power of Design to Affordable Housing: An Evaluation of the Affordable Housing Design Advisor*, presented the results of a series of discussions and focus groups with key target audiences for the Design Advisor (NJIT, 2003). More than 300 community developers participated in these discussions. Additional audiences included 235 architects, 94 government officials, 71 financial personnel, and 46 others, including students and for-profit developers.

The results of the discussions and focus groups were organized into two sets of findings and recommendations: one focused on the general topic of design in affordable housing, and the second focused on specific recommendations for improving and updating the Design Advisor.

In general, the study found the Design Advisor to be a valuable tool, but also a complex one in which specific parts might be equally useful as the whole. In addition, it found that the Design Advisor was not achieving sufficient market penetration to move the meter on design. As the study noted, “The target audience for the tool appears to be very receptive to the message, but not enough of them are hearing it” (NJIT, 2003: 5).

The study provided a series of recommendations—including the estimated level of effort and resources necessary for accomplishing them—based on the following general findings.

- **High priority/moderate resources required.**
  - Significantly expand the number and type of case studies.
  - Expand the number of housing types discussed, especially single family, rural, special needs, and manufactured.
- **High priority/moderate-to-substantial resources required.**
  - Develop information on, and tools for, controlling construction costs.
  - Create guidance on the structure and value of design fees and costs.
  - Provide guidance on appropriate construction materials and methods.
  - Provide guidance on incorporating sustainable and green design into affordable housing.
  - Develop strategies for influencing the pull side of community development.
  - Create substantially more minilectures.
- **High priority/substantial resources required.**
  - Present much more information on the rehabilitation of existing housing.

The evaluation process also revealed some unexpected findings concerning how the target audiences—specifically, community development stakeholders—perceive the meaning, cost, and value of design. The concerns these groups expressed were so consistent and pervasive that they were assembled as a separate discussion within the report as a whole.

### **Good Design: Essential Component or Expendable Amenity?**

Many participants in the study appeared to misunderstand and even mistrust the concept of design quality, equating it primarily with aesthetics, an attribute viewed as desirable—but not essential—to affordable housing. Because aesthetics could be considered an amenity or frill, by extension, so could good design. This somewhat negative bias seemed to be pervasive among the study participants and emerged as a potentially significant barrier to creating better designed affordable housing.

The study concluded that research was needed to better characterize—

- How affordable housing developers understand “design.”
- What, if any, negative associations come with the term.
- How to overcome these negative associations, perhaps via arguments drawn from market-rate development and other sources.

### **The Cost and Value of Design: Perception Versus Reality**

Coupled with the general misunderstanding and mistrust of design described previously was a general assumption that good design costs more and that this extra cost is not worth it. Both these assumptions constitute critical barriers to adopting better design practices in affordable housing.

The study concluded that research is needed to provide definitive answers to three key questions that emerged repeatedly during the course of the study.

1. Does better design, net of amenity costs like high-grade finishes and appliances, add to construction costs?
2. Does better design cost more in terms of architectural fees?
3. If better design does cost more, what added value results from this extra investment?

Definitive answers to these questions will go a long way toward clarifying the true costs of good design in affordable housing and, hopefully, toward debunking current assumptions that good design is always too expensive to afford.

The findings and recommendations from the study, submitted to HUD at the end of 2003, represented a snapshot in time of the Design Advisor’s progress and trajectory since its launch in 2001. They also represented a roadmap for future activity. During the period that the evaluation report was being prepared, training events and other promotional efforts for the Design Advisor continued, primarily in cooperation with the original members of the advisory group.

# The Campaign for Excellence in Affordable Housing Design (2004 and 2005)

One key finding of the HUD evaluation study was that, in spite of recent successes in spreading the word about the Design Advisor, systemic barriers appeared to block the widespread adoption and use of the principles embedded in the tool. For example, although study participants were enthusiastic about the Design Advisor and saw ways that it could immediately help in their community development activities, they were concerned and, in many ways, confused about the more general subject of design and its value and effect in affordable housing.

Parallel to this finding, it also became clear that, although the Design Advisor may be an extremely useful tool for organizations that want to improve the design quality of their developments, it is not, by itself, able to transform the market concerning the value of good design in community development. If community developers misunderstand and mistrust the basic concept of good design, they will be unlikely to use the Design Advisor, no matter how valuable a tool it might be.

The Campaign for Excellence in Affordable Housing Design (hereafter, the Campaign) was developed—with support from the Fannie Mae Foundation—as a means to address and begin to overcome these key barriers to achieving higher quality affordable housing. It was also developed to help the providers of affordable housing (1) understand the meaning and value of good design in affordable housing and (2) see how a commitment to good design could help them in their work (exhibit 3).

## Exhibit 3

### Design Updates, Centerpiece of the Campaign for Excellence in Affordable Housing Design

The screenshot shows a web page titled "Affordable Housing DESIGN UPDATES". At the top, there are navigation links for "DESIGN ADVISOR HOME" and "DESIGN UPDATES HOME". The main header features a photograph of a modern building with the text "Affordable Housing DESIGN UPDATES". Below the header, a "Welcome to Design Updates" section explains that it is a special section of the Affordable Housing Design Advisor, featuring monthly articles or "updates" with real-world examples of great design in affordable housing developments. It states that each update will illustrate where and how good design has made a real difference in creating affordable housing that works: for residents, for neighbors and for the community as a whole. A sub-section explains the purpose of the updates is to help all the stakeholders involved in community development learn more about the meaning and value of good design and, more importantly, to see how a commitment to good design can add value - not cost - to affordable housing developments. Each Update in the series is part of a broader initiative called the Campaign for Excellence in Affordable Housing Design.

On the left side, there is a sidebar with several sections: "ABOUT THE CAMPAIGN" (Mission, Goals and Objectives, Strategic Plan, Sponsor and Partners, Management), "RESOURCE LIBRARY" (UPDATE LIBRARY, Pedestrians), and "UPDATE LIBRARY" (Pedestrians).

The main content area is divided into two columns. The left column is titled "FEATURED UPDATE" and highlights "Update #19: Optimizing Driver/Pedestrian Interaction by Design". The text below this title discusses the importance of safety in the interaction between drivers and pedestrians, noting that the less often they cross, the better, and where they do cross, it is important to reinforce the priority of the pedestrian. It also mentions that drivers on your site are also the pedestrians on your site, and it is important to look at this issue in a positive way too, and ask how to make the transition from being a driver to a pedestrian - and vice versa - a pleasant and convenient one.

The right column is titled "RESOURCES FOR THIS UPDATE" and includes "RELATED DESIGN ADVISOR PAGES" (Vehicle/Pedestrian Interaction, Site Entry and Circulation, Access and Surveillance) and "ADDITIONAL RESOURCES" (DESIGN MATTERS, which contains a catalog of exemplary affordable housing developments throughout the U.S. built between 1980 and 2000).

The centerpiece of the Campaign was a series of 18 short articles, called Design Updates, that discuss the value of design in affordable housing. The Design Updates—written in an accessible and concise manner—explain why design is an important consideration in any affordable housing development, and they lead the reader to additional resources that can help them implement better design in their developments.

The Design Updates were included in a special new section of the Design Advisor. In addition, short paragraphs announcing and describing each new Design Update were provided to the advisory group organizations to be distributed each month via their respective e-newsletters. Readers were provided links from the paragraphs directly to the articles on the Design Advisor. From there, they could find links to additional resources, many of which were found on the Design Advisor itself. In this way, the Campaign was designed to promote not only the concept of good design but also the Design Advisor as a key resource that could help community developers achieve better design in their projects.

The 18 Design Updates were—

1. First Impressions: Great Front Doors and the Difference Design Makes.
2. Designing Porches and Balconies That Work for You and Your Neighbors.
3. Stepping Up to a Great Home: The Value of Well-Designed Stairs.
4. The Heart of the Matter: Designing a Great Interior.
5. Q: When Do Ordinary Outdoor Spaces Become Great Outdoor Places? A: When They Are Designed Like Outdoor Rooms.
6. Benches and Beyond: Designing Great Outdoor Seating.
7. Where a Building Meets the Sky: The Value of Well-Designed Roofs.
8. Making Walls Work for You: Shaping Your Development by Design.
9. Windows Inside and Out: The Difference Design Can Make.
10. Success Is in the Details: How the Smallest Design Decisions Support Your Whole Development.
11. Landscaping: Creating Great Outdoor Places by Design.
12. Getting To, Through, and Around: Delightful Paths and Walkways by Design.
13. Really Good Fences Make Really Good Neighbors: The Difference Is Design.
14. How Big Should a Building Be? How Big Should It Look? Controlling Size and Scale by Design.
15. Can a Building Have Rhythm? Absolutely, and Good Design Provides the Beat.
16. Catching Your Eye: The Importance of Visual Complexity in Housing Design.
17. Reducing the Impact of Parking: The Role of Good Design.
18. Optimizing Driver/Pedestrian Interaction by Design.

The Design Updates were distributed to—

- 6,000 members of the AIA Housing Committee.
- 400 NCCED constituent organizations.
- 1,400 organizations in the NRC Neighborworks network.
- 14,650 recipients of the LISC monthly e-newsletter.
- 2,500 recipients of the monthly Enterprise (formerly Enterprise Foundation) e-newsletter.
- 7 FLHB of Boston Community Investment Officers (who provide information to the 470 participating banks of the FHLB system).

During the course of its implementation, the Campaign was successful in increasing both awareness of the Design Advisor and appreciation for the value of design.

## ***Good Design: The Best Kept Secret in Community Development (2004 and 2005)***

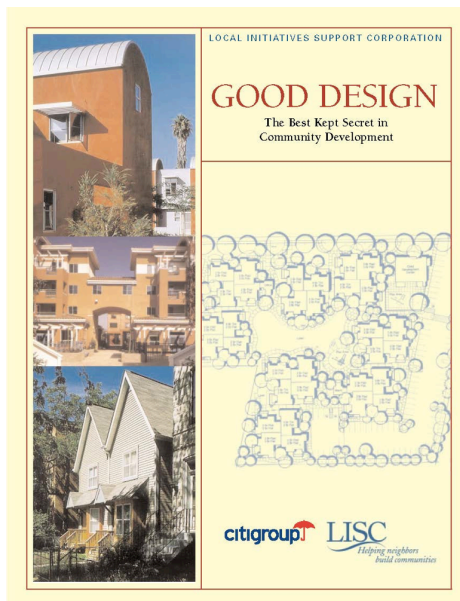
During this period—and parallel to the Campaign—a white paper was developed with support from LISC titled, *Good Design: The Best Kept Secret in Community Development* (Evans and Beck, 2005). The paper was specifically developed to address the concerns about—and the mistrust of—the design process voiced in the HUD study (exhibit 4).

### **Exhibit 4**

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#### *Good Design: The Best Kept Secret in Community Development*

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The paper, which contains multiple short case studies of well-designed affordable housing developments, is organized into four core sections. The first section—What Good Design Is—emphasizes four key points about design: it is (1) essential and not an amenity or frill that can get cut from a development to reduce costs, (2) much more than aesthetics, (3) a process much more than a product and (4) perhaps the most enjoyable and fun aspect of the affordable housing development process.

The second section—What Good Design Does—sets forth the four core criteria for a well-designed development that are described in much more detail in the Design Advisor. Like the Design Advisor, the white paper posits that the goal of a good design process is to create developments that (1) meet the needs of the occupants, (2) understand and respond to the building's physical context, (3) enhance their neighborhoods, and (4) are built to last.

At first glance, these four criteria may seem to have little to do with how many people would define design excellence. They contain no mention of aesthetics or what a development looks like nor convey concern with the wow factor that might normally be associated with design quality. Rather, these criteria focus on a set of outcomes that provide direct and tangible benefits to the occupants of an affordable housing development—and the community where it is located. As noted in the paper and on the Design Advisor, design quality means—

1. **Meeting occupants' needs.** Well-designed developments understand the needs of their occupants and how these needs affect physical design. One size definitely does not fit all. Families with children may need larger homes with more bedrooms, larger kitchens, and more storage. Elderly people living alone, on the other hand, may need less space but will require more of that space to be designed with accessibility issues in mind.
2. **Understanding context.** Although the context in which an affordable housing development is brought to life includes socioeconomic, legal, and regulatory issues, the physical context is most important from a design perspective. How wide are the sidewalks? Are they completely paved or do they have a grassy strip? What do the roofs of neighboring houses look like: pitched or flat, gabled or hipped? What are the primary exterior materials? What are the main colors? Do most of the surrounding houses have porches, patios, or decks? How is open space handled? Such questions can help define the physical context in which a new development will be located and can help the design team create housing that responds positively to this context.
3. **Enhancing neighborhoods.** All affordable housing developments, no matter how small, have a responsibility beyond simply meeting the needs of their occupants. They also have a public responsibility to add to and enhance the neighborhoods in which they are built. Good design is critical to this process and to moving developments beyond the goal of simply providing shelter to the goal of building communities.
4. **Building to last.** Good design can help ensure that a development stands the test of time. By designing in materials, systems, and finishes that are durable, easy to maintain, and energy efficient, a development team can ensure that its projects are cost effective and built to last, needing minimal repair and upkeep over time.



All four of these outcomes are tied to the physical aspects of a development and can be achieved only through intelligent, sensitive design. If they are achieved, the result will be a development that works—one that is fully occupied, increases in value, has residents who are proud of where they live, and has neighbors who are pleased as well. Any development that meets these goals constitutes a lasting community asset that is, by definition, well designed.

The white paper concludes with two short sections—What Good Design Costs and Who's Responsible for Good Design. The paper was distributed widely by LISC and through the Design Advisor site as part of the Campaign. It is still available on the Design Advisor website.

## **Going Green (2005 Through 2008)**

Beginning in late 2005, the Design Advisor began to add new content related to green affordable housing. For 3 years, Design Advisor staff worked closely with representatives of the AIA Housing Committee and the AIA Center for Communities by Design to create a comprehensive new section of the Design Advisor Gallery focused on green, sustainable design. The AIA, as a partner in Enterprise's Green Communities Initiative, assembled and juried a selection of high-quality affordable housing projects that also focus on sustainable design principles to help demonstrate how green design in affordable housing can be achieved. Design Advisor staff assisted the AIA in administering the "Show You're Green" program and in formatting and posting the selected projects on the Design Advisor site.

The result was the Green Housing Projects Gallery, which includes 34 detailed case studies of affordable housing developments that are both well-designed and green, organized according to the 10 criteria used by the juries to assess the projects: (1) community context, (2) site design, (3) building design, (4) water conservation and management, (5) energy efficiency, (6) less material use, (7) recycling, (8) indoor environmental quality, (9) quality assurance, and (10) other.

The creation and posting of these new case studies during the course of 3 years constituted a major addition to the breadth of content available through the Design Advisor and was a testament to an innovative and effective collaboration with the AIA.

Parallel to the Show You're Green case study effort, the Design Advisor also received funding from a private foundation to create an innovative new educational tool focused on green affordable housing. The Affordable Green Academy (hereafter, the Academy) was developed based on a survey—posted on the Design Advisor—that asked community development stakeholders about their current construction practices and about the types of green guidance they would find most useful. Based on the results of the survey, a decision was made to focus very explicitly on the practical specifics of how to actually detail and construct affordable green housing.

The resulting Academy contains online courses taught by recognized building science experts. The courses—and their accompanying online tests—are designed for community development organizations as training or certification programs for their staffs and contractors. The courses contain 10 sections: (1) introduction, (2) principles and goals, (3) the house as a system, (4) foundations, (5) floors, (6) walls and windows, (7) roofs and attics, (8) mechanical systems, (9) environmental materials, and (10) managing green.

The Academy also includes a series of narrated, online case studies that illustrate how to put the lessons learned from the courses into practice in real affordable housing developments (exhibit 5).

## Exhibit 5

### The Affordable Green Academy

**AFFORDABLE GREEN Academy**  
Bringing the power of green to affordable housing

**About the Academy** | **Courses and Case Studies** | **Links and Resources** | **FAQ**

**Member Login**  
Username:   
Password:    
Forgot your password?  
Register for an account!


**Welcome to the Affordable Green Academy!**  
This special site provides a series of courses and case studies on the nuts and bolts of building affordable green housing. **ALL OF THE COURSES ARE FREE!**  
**COMPLETE THE ACADEMY AND EARN .9 NARI CEU'S!**

To get a quick sense of what our Academy offers, check out this [introductory walk-through video](#) of the site

To access the courses on our site, we'd like you to register [here](#)

Once registered, you'll be able to view and take tests for the following courses:

- Principles and Goals
- The House as a System
- Foundations
- Floors
- Walls and Windows
- Roofs and Attics
- Mechanical Systems
- Environmentally Responsible Materials
- Managing Green



After viewing each course in the Academy, you can take the course tests. Once you pass all 9 tests, you'll be able to print your own Affordable Green Academy Certificate of Completion.

You'll also have access to the following material:

- The Energy Star Training
- A Profile of the NJ Green Homes Office
- A Case Study of Eastampton Town Center Case Study, Eastampton, NJ
- A Case Study of Bellevue Court Microload Homes Case Study, Trenton, NJ
- An Interview with Green Architect, Chris Benedict, R.A.

This site was developed by the Center for Building Knowledge at NJIT, who also manage its sister site, [The Affordable Housing Design Advisor](#)

## **Reverse-Engineering the Design Advisor As a Funding Review Tool (2008 and 2009)**

Beginning early in the deployment process for the Design Advisor, attempts were made to have funding agencies use the tool in their proposal review processes. Some early success occurred when the Community Development Commission (CDC) of the County of Los Angeles adapted the Design Advisor's 20 Steps to Design Quality as a guide to awarding discretionary design points for developments seeking funding. Using the Design Advisor in this way helped make the design review process more systematic and credible, and the CDC used the tool for several years starting in 2002.

In 2008, a new opportunity arose to revisit this use of the Design Advisor when the Pennsylvania Housing Finance Agency (PHFA) initiated a special Excellence in Design Initiative (hereafter, the Initiative) layered on top of its existing Homeownership Choice funding programs. PHFA decided to use the Design Advisor as the basis for the Initiative and as the underpinning for a required design study, prepared by the development teams, that would demonstrate how the proposed project meets user needs, understands and responds to its context, enhances its neighborhood, and is built to last. The goal of the Initiative was to establish a standard for preliminary design that would incentivize development teams to integrate the meaning, value, and process of good-quality design in developing affordable housing.

Working with the Philadelphia-based Community Design Collaborative, Design Advisor staff successfully reverse-engineered the Design Advisor to provide guidance both to the developers submitting proposals and the PHFA team reviewing them. The result was a successful initiative that fostered a new and more widely shared awareness of the value of design and, in some cases, resulted in improved overall design quality. This new focus on design unfortunately was not maintained after the pilot phase of the Initiative was complete. Awareness of the issue remained, but a structured approach to incentivizing good design, based on the results of the Initiative, was not institutionalized across all PHFA programs.

## **Maintenance and Promotion (2010 Through 2012)**

The years 2010 through 2012 were relatively quiet for the Design Advisor. The tool was maintained and stakeholders still accessed it, but promotion was minimal and no new content was added.

## **Makeover and Relaunch (2013)**

In 2013, the Design Advisor underwent a substantial makeover. The emphasis shifted from being a structured (and often very linear) tool for stakeholders to use to being a rich set of curated resources that stakeholders could access. Many of the older references were eliminated; the step-by-step guidance that was the centerpiece of the original Design Advisor was downplayed; and core resources—specifically the Design Considerations section, the Gallery, and the training resources—were given more prominence.

The updated version of the tool launched in early 2014 with the same web address as the original: <http://www.designadvisor.org> (exhibit 6).

## Exhibit 6

### The Redesigned Affordable Housing Design Advisor Homepage

The screenshot shows the homepage of the Affordable Housing Design Advisor. At the top, the logo reads "Affordable Housing DESIGN ADVISOR" with the tagline "Bringing the power of Design to Affordable Housing". A search bar with a "GO" button is on the right. Below the logo is a navigation menu with items: Home, 9 Design Considerations, 7 Steps to Design Quality, Gallery, Training, About Us, Resources, and Contact Us. The main content area features a large banner with the text "Welcome to the Affordable Housing Design Advisor" and a list of links: "Quick Guide to Using This Site", "WHAT is good design?", and "WHY is good design important?". Below the banner are three featured sections: "7 Steps to Design Quality" with an image of a building entrance, "9 Design Considerations" with an image of a brick building entrance, and "Gallery" with an architectural site plan. Each section includes a brief description and a "View" link.

**Affordable Housing DESIGN ADVISOR**  
Bringing the power of Design to Affordable Housing

Home | 9 Design Considerations | 7 Steps to Design Quality | Gallery | Training | About Us | Resources | Contact Us

**Welcome to the Affordable Housing Design Advisor**

If you're part of the solution to America's critical affordable housing challenge, this site is for you. The Affordable Housing Design Advisor brings together experience and ideas from successful affordable housing projects all over the country.

Good design can make a world of difference for the people who will live in the affordable housing you help build, and for the neighborhood surrounding it.

- [Quick Guide to Using This Site](#)
- [WHAT is good design?](#)
- [WHY is good design important?](#)

**7 Steps to Design Quality**

The principles of good design are the same for every project, no matter its cost, but designing affordable

[View All 7 Steps](#)

**9 Design Considerations**

Welcome to the 9 Design Elements Checklist - one of the core components of the Affordable Housing Design Advisor.

[View Design Elements](#)

**Gallery**

The Reservoir is a resident-managed, limited equity cooperative designed for families, and singles.

## Next Steps (2014 and Beyond)

With its recent update and relaunch, the Design Advisor is poised to reengage the affordable housing community on the issue of design quality. In addition to seeking partners and resources to more broadly deploy the existing tool and increase its use, the site's managers will pursue a series of new initiatives with the potential to expand the scope and utility of the tool.

## **The Design Advisor As a Funding Review Tool**

Since its launch, the Design Advisor has stepped into the design review process twice. Both times, the results were positive but short lived. A new initiative to focus greater attention on design in the funding of affordable housing—by using the Design Advisor to underpin a more systematic approach to the design review process—could be a very powerful way to encourage funding agencies to move beyond the common “money, land, and pro forma” approach to development and to demand better design.

## **Renovation and Rehabilitation**

The Design Advisor primarily focuses on new construction and therefore does not address the wide range of community development activities involved in renovating and rehabilitating existing housing. As the Design Advisor moves forward, it will seek partners and resources to create a companion tool focused on improving the design of this substantial segment of the affordable housing marketplace.

## **Materials and Methods Information Exchange**

During the process of developing the Design Advisor, affordable housing stakeholders often noted their need for practical information on which systems, products, and materials work well in affordable housing developments—and which do not. Community development organizations working in the field have a wealth of knowledge and experience in this area, but they have no way to share it with others and, at the same time, have their own questions answered. One goal of the Design Advisor from its inception was to become firmly enough established in the affordable housing community across the country so that it could provide a platform for robust, peer-to-peer exchanges about such issues.

That goal has not happened yet, but it is still a goal that the managers of the Design Advisor intend to pursue vigorously in the future, taking maximum advantage of the social media explosion that has happened since the Design Advisor launched more than a decade ago.

## **Author**

Deane Evans is an architect who currently directs the Center for Building Knowledge at the New Jersey Institute of Technology. In 1998, he served as the Founding Director of the U.S. Department of Housing and Urban Development’s Partnership for Advancing Technology in Housing (PATH) program within the Office of Policy Development and Research.

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# Designing Better Designers: Families First

Katie Swenson

Enterprise Community Partners

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## Abstract

*Affordable housing design has evolved significantly during the past several decades. The needs of communities have changed. The roles and responsibilities of designers, developers, and policymakers have also evolved—sometimes in response to the needs of the communities they serve, other times in response to market forces. This article contemplates the perspective and evolution of the role of the designer, focusing on developments from the past 10 to 15 years. Looking through the lens of the Enterprise Rose Architectural Fellowship, a 3-year fellowship that pairs an emerging designer with a host community development organization, I share valuable insights and lessons learned that could be leveraged into a new normal for affordable housing design practice. In particular, I argue that collaborative design is no longer about one-way community engagement; it is about two-way, long-term, place-based community relationship—designers living in the communities that they serve. In addition, I suggest that good design in affordable housing is incomplete without the supporting infrastructure that provides access to transportation, employment, renewable resources—electricity, water, and food—and the positive human interaction of a thriving neighborhood. Good design goes well beyond the physical and temporal boundary of a completed building. To move the affordable housing industry forward, we must first design better designers—designers who see the part and the whole, the individual and the community, the house and the neighborhood, and the past and the future.*

## Introduction

Numerous architectural treatises have been put forth that imagine a future in which all people have a beautiful home that not only provides a safe, stable, enriching environment, but also that is part of a thriving neighborhood with all the necessary resources of transportation, schools, health care, and nutritious food. Recent initiatives in the affordable housing community are attempting to make this designed vision a reality. Who determines the form of housing? Is it the traditional aggregation of designers, developers, and policymakers, or is it the resident families and communities?



Many trends have occurred in the process and form of affordable housing development. Large-scale public housing blocks epitomized low-income housing in the latter half of the 20th century. Pruitt-Igoe in St. Louis and the Robert Taylor Homes in Chicago are examples of a class of public housing that ultimately failed to uplift the communities they were trying to serve. The density, seclusion, and poor design of these developments created environments that increased social isolation, stigmatization, crime, and, increasingly, poor health outcomes (Dannenberg et al., 2003). Scholars and practitioners have credited these failures to the lack of sensitivity to residents' needs (Frumkin, 2002). Critics have argued that architects traditionally are at worst detached idealists and at best service providers too far removed from the experiences of low-income residents. Then-president of the National Urban League, Whitney Young, Jr., publically aired this sentiment at the 1968 American Institute of Architects' Annual Convention: "... you are not a profession that has distinguished itself by your social and civic contributions to the cause of civil rights, and I am sure this does not come to you as any shock. You are most distinguished by your thunderous silence and your complete irrelevance" (Young, 1968).

In the past decade, however, the quality of affordable housing design has vastly improved, supported by efforts like the Affordable Housing Design Advisor,<sup>1</sup> the networks of the Association for Community Design, and the documentary exhibits and monographs produced by numerous architectural scholars. Examples of this qualitative shift abound in the contemporary affordable housing world. These structures are changing the image of design among housing advocates from one of stagnation and social isolation to one of leadership and progress, especially in the sustainability conversation.

Via Verde in the Bronx, New York—which is perhaps the most notable recent example of transformative collaboration between community, developer, and architect—received national acclaim for both design excellence and progressive social impact at the neighborhood scale. The roof gardens and integrated food systems, in particular, demonstrate the power of systems-level design thinking. The Codman Square EcoDistrict project in Dorchester, Massachusetts, is proposing a neighborhood-scale solar project that has the potential to promote energy independence for the whole neighborhood and to provide a measure of socioeconomic equity to the residents. On the west coast, community developers—like Central City Concern (CCC) in Portland, Oregon—are systematically evaluating how they implement sustainability throughout their building portfolio.

In this article, I look back at how the perspective and role of architects in affordable housing development have evolved using the lens of the Enterprise Rose Architectural Fellowship (hereafter, the Rose Fellowship), a program that embedded its first class of Rose Fellows with community developers in 2000. In particular, I argue that programs like the Rose Fellowship that focus on the professional development of young architects have—

- Increased awareness of neighborhood-scale civic relationship and collaboration within the broader profession.
- Increased the number of designers interested and working in affordable housing.
- Ultimately produced high-quality housing and communities with the capacity to thrive beyond the completion of a building.

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<sup>1</sup> <http://www.designadvisor.org>.



Through a discussion of specific examples, I will share the returns that I have witnessed from this bottom-up investment strategy, which I believe is creating market demand for higher quality design in affordable housing today than we experienced 10 to 15 years ago, when the Rose Fellowship began. Housing designers can learn from the great strides forward that the fellows have made in their respective communities. I specifically highlight the value of understanding and appreciating the specificity of place alongside the social imperative of providing supportive housing infrastructure in tandem with quality housing.

## **The Enterprise Rose Architectural Fellowship**

In the year 2000, community developers and emerging architects were first invited to apply for the 3-year Rose Fellowship, funded by a grant from Enterprise Community Partners, and named for Frederick P. Rose, a prominent developer and philanthropist who believed in the value of good design and the spirit of public service. A community development host organization would hire a Rose Fellow onto its staff to bring the vision and resources of design to the development team and into the critical path of affordable housing projects. The Rose Fellowship was designed to provide these emerging architects first with enough time to become immersed in listening to the unique circumstances of their new community. Then, enabled by earned trust and relationship, credible, catalytic interventions would emerge in the spirit of the Rose Fellowship's mission to create sustainable, equitable, connected communities for people of all income levels.

In 2000 and 2001, nine Rose Fellowships formed, in communities as diverse as a tribal housing authority in northern New Mexico; a border community in San Ysidro, California; inner-city Los Angeles; and the Martin Luther King district in Atlanta. The Rose Fellowship hosts of those early years ranged from regional affordable housing developers, to neighborhood-based developers, and to university design centers such as the Rural Studio outreach program at Auburn University.

The early Fellows were pioneers in many ways. The nine individuals worked in diverse communities across the country, with a shared fellowship but with nearly no structure from the program. As a group, they came to develop their own set of values and a shared vision for the Rose Fellowship. Together, they developed a set of principles establishing what good design meant in the context of their communities. They also formed an informal support network for one another—sharing projects, stories, best practices, and, perhaps most importantly, failures.

Most Rose Fellows entered the program with skills in community engagement and green building. Learning the affordable housing design, development, and financing mechanisms was new for nearly all of them. Few had received training in real estate development, and understanding how to bring priority to design excellence was a shared challenge. The language of many Community Development Corporations (CDCs) at that time still spoke to the primacy of providing shelter, or providing fit and affordable housing.

Jim Rouse, who founded Enterprise Community Partners in 1982, was quoted as saying, “We believe, because it is true, that people are affected by their environment, by space and scale, by color and texture, by nature and beauty, that they can be uplifted, made comfortable, made important” (Columbia Association, 2011: 9). Although community developers certainly had a goal to create

quality housing, no stated methodology incorporated design principles into the development process. Convincing CDC leadership to invest in design quality was a major challenge in the housing community in recent decades, but the investment in integrated design has since become a central component in the community development field. The demand for professionals with the capacity to work in this field has increased consequentially, as exemplified by the competitiveness of the Fellowship.

In attempting to understand the gaps in the traditional training of architectural practitioners that the Rose Fellowship and others are filling, it is helpful to look at key skills Rose Fellows practice in their fellowships.

- Building relationships between community members and designers.
- Demonstrating the propensity and capacity to be more innovative in design, based on both funding constraints and developer broadmindedness.
- Understanding affordable housing developers' organizational practices and redefining their missions to include design skills.
- Developing functional programs tailored for residents and occupants that may not match the traditional conceptions taught in architectural education.
- Scaling design interventions to incorporate neighborhoodwide and communitywide considerations beyond a single development or unit.

In the following sections, I demonstrate the acquisition of these skills with specific examples.

## Community Relationships

Developing community relationships has been a core strategy of the Rose Fellowship since day one, and the understanding of the importance of participatory design to creating lasting, healthy communities continues to unfold. Many development projects either choose or are mandated to perform some form of community engagement as part of their development process. The Rose Fellowship has shown that when designers enter into a long-term relationship with a community—and the lines between community member, planner, designer, and advocate for a better future are blurred—the rewards are robust. The Rose Fellowship therefore seeks not only to build excellent projects, but also to support those communities that continue striving to create a more sustainable, equitable, and healthier future for residents long after design and construction are complete.

An example of a commitment to a long-term relationship came from the beginning of the Rose Fellowship's history. A member of the first class of Rose Fellows in 2000, Jamie Blosser, partnered with the Ohkay Owingeh Housing Authority (OOHA) at Ohkay Owingeh, a Pueblo established centuries ago on the east bank of the Rio Grande River in northern New Mexico. OOHA had a long waiting list for families seeking housing, and a new U.S. Department of Housing and Urban Development (HUD) guarantee program passed in 1996, which for the first time granted access to conventional mortgage lending for families living on tribal trust lands, had not yet been implemented there, making rental housing the only option to increase housing supply. To build 40 new units

and a community center, the Director of OOHA, Tomasita Duran, used the 1996 Native American Housing Assistance and Self Determination Act (NAHASDA) Indian Housing Block Grant and the Rural Housing and Economic Development grant to leverage five other sources of financing, including low-income housing tax credits (LIHTC) totaling \$4.8 million.

NAHASDA created an opportunity for local residents to institute their own vision and make decisions regarding land use planning. It also created a unique opportunity for architects, planners, and landscape architects to bring their skills to the benefit of these communities.

Since the 1960s, lacking mortgage financing, the Pueblo had typically received single-family HUD bungalows spread out on 100-by-100-foot lots. The new development built on the ancient, community-oriented settlement patterns of the historic plaza and village center, Owe'neh Bupingeh. The plaza area was once lined with several hundred historic adobe homes dating back at least 700 years. More than 60 percent of these adobe homes had fallen into ruin and disrepair by the turn of the 21st century and were used only for tribal feast days, if at all. HUD investment in the single-family, subdivision-style bungalows outside the historic core—the classic suburban sprawl 'American dream' of the mid-20th century—sped the decline of the traditional adobe homes.

During the development process, some tribe members at first had difficulty with the notion of attached housing, having become accustomed to single-family homes, but tribal elders began to tell stories of what life was like growing up on the plaza before it had fallen into disrepair. Blosser recounted—

During the community design meetings, we learned that on the traditional feast days the women typically worked in cramped kitchens preparing food for hundreds of people, which was then served throughout the day in cramped living and dining room quarters. We designed open floor plans to accommodate more flexibility on these busy days. (Morrish, Schindler, and Swenson, 2009: 55)

The new project using NAHASDA funds in combination with LIHTC at Ohkay Owingeh, called Tsigo bugeh Village, was designed to set a standard for incorporating community-driven, culturally significant design into all aspects of the planning, and its success set a new precedent for the tribal council (exhibit 1).

A few years after the completion of Tsigo bugeh Village, Duran said to Blosser, "I wish we could bring families back to the Pueblo—what if we restored the housing there?" (Blosser, 2006). Thus was born the Owe'neh Bupingeh Rehabilitation Project, a multiyear affordable housing rehabilitation project within the historic core, consisting of four plazas. Of the several hundred homes that once surrounded the historic core, only approximately 60 remained, and the rest were abandoned because of deterioration. Robert Gauthier, from the National American Indian Housing Council, stated—

In more than 30 years of affordable housing experience with HUD construction certification, I have never witnessed a more complex project. From an outsider's point of view, this project was brilliantly conceived and illustrates an uncommon level of sensitivity and intelligence. This potential to bring back to life, as the heart of the tribe, up to 60 homes, is an unprecedented effort to preserve the culture as well as cultural activities associated with traditional living. (Gauthier, n.d.)

## Exhibit 1

### Homes at Tsigo bugeh Village, Ohkay Owingeh, New Mexico



Source: Harry Connolly

Every member of the project team learned about the tribe’s history, saw ancient settlement patterns with fresh eyes, thought about how density might protect precious tribal land, listened to individual needs, and tapped into the community’s culture. That process led to the realization of a first successful housing development—Tsigo bugeh Village—and its success continued with the Owe’neh Bupingeh Rehabilitation Project, providing a clear example of why and how relationships between housing designers and the recipient community create better designers. The spirit and learning of that process then led the tribe members to see their sacred plaza with a fresh perspective and enabled families to move back again. Blosser said, “The rehabilitation of the village was successful because we opened a discussion of underlying cultural values and were able to manifest some of them in architecture” (Blosser, 2009). The investment of time, energy, resources, and care in fully exploring with a community their vision, history, values, and aspirations led to meeting shorter term goals and to reinforcing a resilient optimism in community members.

## Design Quality

Relationships between designers and communities consequently also yield better design. In Los Angeles, Theresa Hwang, a Rose Fellow partnered with Skid Row Housing Trust (SRHT), worked to house and empower formerly homeless individuals through better designed housing, resident engagement, and social services. Supportive housing has been a recent innovation in the housing sector, based on the realization that providing housing alone is not enough. Housing providers

have found that incorporating social services and medical care into their buildings creates better success rates for residents, especially chronically homeless individuals or those with addictions or disabilities. Supportive housing models typically have two legs: (1) the permanent apartment unit, and (2) the social services, including physical and mental health care.

With the creation of Hwang's main project, the Star Apartments, SRHT and its partner Michael Maltzan Architecture pushed this model to include a third leg: nonclinical therapeutic amenities such as yoga, basketball, gardening, and art classes. Star Apartments provides more than 15,000 square feet of community space with amenities that contribute to the integrated approach to resident support (exhibit 2). For SRHT, design goes beyond aesthetics; it enhances programs and building functions. The building and the overall living environment have a significant effect on the rehabilitation process and the challenge of ending homelessness.

SRHT initiated a participatory design process during the early development stages. The team brought in residents, social workers, and maintenance staff from its existing housing portfolio, collecting feedback on which building features worked and which did not. For example, glazing proved very important, because it allows for visual transparency for a welcome and open feel but is also safe and secure for staff and workers. This process directly informed the spatial layout, incorporating what residents actually wanted rather than assuming what they needed. In her nearly 5 years working

## **Exhibit 2**

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### **Star Apartments, Los Angeles**



Source: Skid Row Housing Trust



with SRHT, Hwang has developed a community engagement model based on trusting relationships with residents, staff, and the design and development team. SRHT has an ongoing feedback loop with the designers and users of the buildings to create an open conversation about what works, constantly testing and discussing ideas. This type of innovation is not possible without the consistency of grounded relationships.

## Technological Innovation

Another outcome of exposing professionals to affordable housing needs is the increased ability to experiment with new technologies—a clear opportunity often embraced to a much greater degree by affordable housing developers than by commercial developers, especially for energy-efficient and green building techniques.

Since its inception, green building has been catalytic for community development, in that it has brought a rigorous methodology for measuring quality. The converse is perhaps more provocative: affordable housing has been transformative for the green movement, in that it brings into question the ultimate goals of *sustainability*—that which creates a more sustainable environment for both people and the planet. Although the environmental movement goes back decades, green building became increasingly well established and codified with the emergence of the U.S. Green Building Council's LEED (Leadership in Energy & Environmental Design) program in the late 1990s. Other green building standards and guidelines soon followed, including the Enterprise Green Communities (EGC) Criteria for assisted housing projects in 2004. EGC was the first green building rating system designed specifically for affordable housing. In addition to including many LEED-like criteria, EGC emphasized the importance of site selection, encouraging access to transportation and neighborhood amenities, and also emphasized indoor air quality, resident engagement, and asset management. Michael Gatto, a Rose Fellow with Foundation Communities in Austin, Texas, helped author the criteria and developed more specific expertise in the field.

In the early days of the Rose Fellowship, only a few affordable housing developers were thinking about green building. My personal experiences serve as an example for this change in practice. When I started at Piedmont Housing Alliance (PHA), in Charlottesville, Virginia, in 2001, PHA gave little if any thought to green building or to architectural design that considered environmental impact. Builders essentially designed the house, building according to the standard practice of maximizing efficiency within the constraints of the building code, with 2-x-4 framing, batt insulation, vinyl siding, and a heat pump. For me, building green was the surest way to argue for upgrading the building quality in every way, including lowering energy bills, removing air pollutants, increasing durability, and improving aesthetics. At the time, however, tension existed on the PHA Board of Directors between those who were committed to providing no-frills housing and those who saw that the quality of the housing mattered—and that it brought more benefits than costs.

Energy and water efficiency could be monetized, but the other benefits, including indoor air quality, could not be measured at that time. As PHA built the first ENERGY STAR house in the community, and then the first EarthCraft house, the excitement began to build. Not only was the product innovative, it was aesthetically beautiful, leading PHA to commit further to both design and green

building. A partnership with the University of Virginia School of Architecture led to the EcoMOD design-build program. As PHA began to earn recognition and win awards for its green building, the housing organization caught the spark of innovation and went on to do increasingly challenging work, like modular and prefabricated construction. Building green changed the way PHA thought about its mission, from that of providing affordable housing opportunities to that of providing quality of life for its residents.

## **Organizational Changes**

Rose Fellow Colin Arnold, meanwhile, was working with Community Housing Partners (CHP), one of a few groups in 2001 to see the potential for sustainability to reshape its organization. CHP's President and Chief Executive Officer, Janaka Casper, is one of the most sought-after leaders in the community development field. Casper has grown the organization exponentially during the past 13 years and now manages a portfolio of more than 6,000 units. When CHP brought on Arnold, it set about using the concepts of sustainability to affect every aspect of its business, from construction to accounting. Arnold pushed CHP to build to a high green standard and constructed a LEED Silver-certified boys home in 2003, which became both a symbol and a learning laboratory for research (exhibit 3).

Casper said to a crowd of about 300 people at a Housing Assistance Council meeting that the "Rose Fellowship was the single most transformative program that CHP has ever experienced" (Casper, 2012). The Rose Fellowship gave the organization a method and the resources to evolve its mission, and CHP has deepened its commitment to sustainability over time. Arnold is still with CHP

### **Exhibit 3**

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#### **Tekoa Boys' Home, Christiansburg, Virginia**



*Source: Alan Scherry*

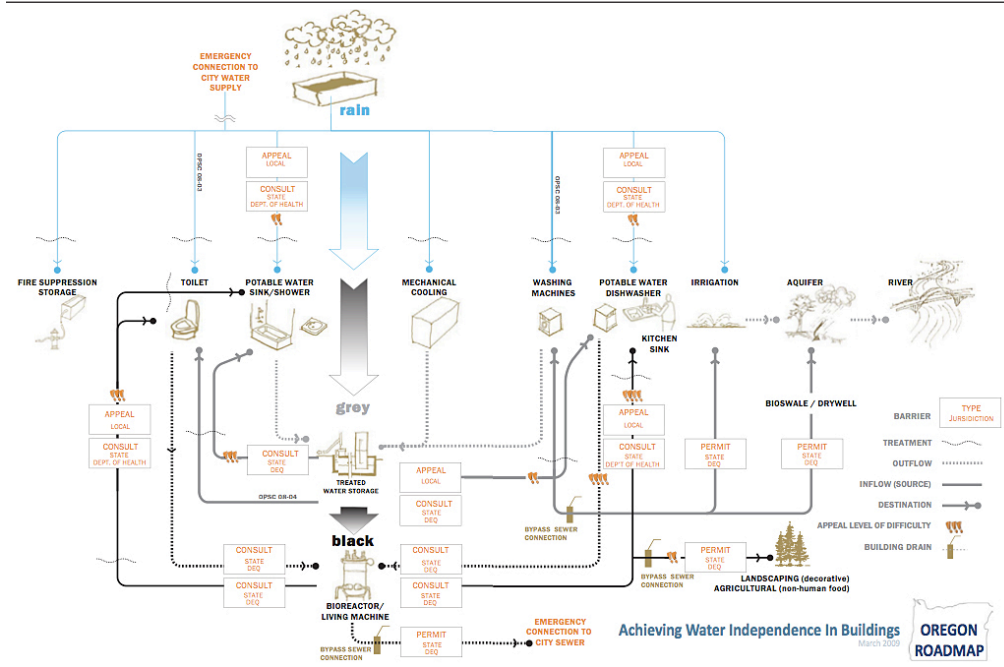


13 years later, now leading perhaps the only design division of a CDC, with four architects on staff. Whereas most CDCs contract out their architecture and design services, CHP not only has the design function in house, it uses its expertise in designing green affordable housing to serve as a consultant for other, less sophisticated housing groups.

Expanding the role of the professional designer as a resource to affordable housing developers has also led to some unexpected outcomes. Ben Gates, a Rose Fellow with CCC, had ambitions to push green design even further, from energy and water efficiency to net-zero energy and water use. Many nonprofit affordable housing providers, like CCC, that own and manage large portfolios already understand how energy and water efficiency directly affect the bottom line. Inspired by other, more aggressive green building guidelines like the Living Building Challenge and the International Living Future Institute, Gates set his sights on achieving water independence in a new family housing building planned in downtown Portland for residents recovering from drug and alcohol addictions. Gates also mapped all the steps needed to achieve water independence, from conservation, to capture, to reuse, looking at the technological requirements and the policy barriers at the city and state levels. Gates made a series of diagrams (exhibit 4) that revealed many needless barriers and published these diagrams in a book, *Achieving Water Independence in Buildings*, which has since become a critical reference for developers and policymakers seeking to create net-zero and net-positive buildings of all types and to change state law, building codes, and regulatory rules to allow for rainwater and gray water to be recycled in buildings (Gates et al., 2009).

**Exhibit 4**

Chart From *Achieving Water Independence in Buildings*



Source: <http://www.enterprisecommunity.com/resources/ResourceDetails?ID=67380.pdf>

## Functional Programs

Design and development usually involve a program. The program of the building may read: 60 units of one-, two-, and three-bedroom units for residents earning 30 to 80 percent of AMI. Samuel Mockbee, founder of the Rural Studio and a Rose Fellowship mentor from the first year taught students of the Rural Studio the concept that designing the program is designing the architecture. The development of a program is common to professional practice, yet it is often one that is not considered thoughtfully and reflectively—a critical omission when considering communities and occupants with special needs. The practice of architecture, then, has been enhanced with the exposure to programming in these unique and challenging cases and to the methods for eliciting the needed program.

In Roxbury, Massachusetts, for example, Rose Fellow Mark Matel has used a community arts approach to formal programming, not only to revitalize a former bus yard site, but also to reenergize a neighborhood around expressing its own creativity and positivity. Living in a neighborhood with terrible crime and poverty statistics, residents of Roxbury view affordable housing development with skepticism. Some say that the neighborhood already has too much affordable housing; others say that the neighborhood is being gentrified. Matel has been living in the midst of this debate, hearing all sides and getting to know the complexities—and personalities—in the neighborhood. He suggested taking an alternative approach from which everyone in the neighborhood could ideally benefit, investing and celebrating all the positive qualities of the people and culture of Roxbury.

In May 2013, Matel and his colleagues invited 85 local artists to spray paint the garage doors of the bus yard buildings. The event drew more than 1,000 people to the site that had been fenced off for 20 years, energizing it first with art and not long after with music, dancing, food trucks, and ice cream vendors. The electricity of that day, and of the concept of creating a stage for the community's most creative endeavors, led Mark and the organizers to create “Bartlett Events,” which offered a structure through which community members could stage their own events on the site (exhibit 5).

### Exhibit 5

#### Bartlett Events, Roxbury, Massachusetts



Source: Mark Matel

Roxbury still plans for 323 units of housing plus retail, parking, open space, and so on. Now, however, thanks to the energy of Matel and his colleagues, the proposed development is developing an identity, and that identity, or vision, is attracting people who want to animate this formerly derelict site into a creative community that looks to the neighborhood culture as a source of inspiration.

## Broadening Scale

Early in its history, Enterprise Community Partners was aware of the broad scope of issues associated with any one housing development. Rouse, for example, recognized that “decent, affordable” housing is a fundamental platform for a successful life, but he knew that housing alone was not enough. “Job training, crime prevention, education and health care, as well as affordable housing, are all part of the solution. We cannot improve the lives of people unless we do all these at one time” (Columbia Association, 2011: 9). In short, housing needs a place within a thriving, uplifting neighborhood.

Traditionally, however, architects focus on the specific structure at hand—often at the expense of considering even the neighboring structures, let alone the broader community in which a project sits. The Rose Fellowship exposes young professionals to the task of seeing the larger challenges and aspirations of the community in which they work.

Some of the most exciting design work is going on in neighborhoods where CDCs are investing deeply in green infrastructure at the neighborhood scale. In the early days of green affordable housing, the Rose Fellowship addressed integrated design at the single house or building scale. Buildings became more efficient and then healthier and now net zero or net positive. Solving one building at a time has inherent limitations, however.

A significant challenge of approaching sustainability at the scale of a city, however, is sharing the benefits of green infrastructure equally across the socioeconomic spectrum. In particular, low-income residents are typically left out.

Architects who have been at the forefront of targeted investments in infrastructure at the neighborhood scale can create direct, tangible benefits for those who need it most. CDCs, long skilled in social services, financial counseling, and housing development are maturing into a new phase of their role.

A few miles from Matel’s work in Roxbury, Rose Fellow Mike Chavez is working with three ambitious CDCs that have joined in a collaborative effort to revitalize a transit corridor in Dorchester. Close to the center of Boston, this neighborhood had a commuter rail line running through it that, until recently, made no local stops. Although residents of Dorchester were not far from downtown Boston, they had long commutes on multiple buses. Community organizing led the three CDCs and many others to unite and successfully advocate for new stops in their neighborhoods. Today, four stops are open and three are in process, and the public transit authority agreed to match the regular subway fare rather than charge the higher commuter rate. The successful advocacy campaign gave neighbors in the Talbot-Norfolk Triangle an organizing framework and big ambitions.

The good news about being more connected to transit is obvious, but the danger is that the neighborhood will quickly gentrify, and the existing residents will be priced out. These residents have set an ambitious goal to turn their neighborhood into an “EcoDistrict” where investing in green infrastructure would financially benefit the community. Codman Square Neighborhood Development Corporation, one of the organizations with which Chavez has partnered, is in the planning stages of a community solar project that would invest the benefits of the energy savings back into the community through the CDC. CDCs are taking bold steps to ensure that residents will not only have a better quality of life, but also that they will retain their neighborhood fabric, identity, and commitment to the mutual empowerment of themselves and their neighbors.

## **Conclusion: Envisioning a New Architecture Practice**

All housing is designed by some person or some group of people. A series of decisions, choices, and tradeoffs is always required. The questions, “By whom?” and, “To what end?” are too often unasked. Housing designed by professional designers with the guidance and imperatives of the community can become an architecture that speaks to the past, present, and future of a community. As demonstrated in New Mexico and Boston, housing is designed not only to achieve the highest environmental sustainability standards, but also to reflect the entire community in question.

Mockbee taught architects and community designers many things, but chief among them was that architects should be civic activists.

Architects are by nature and pursuit, leaders and teachers.... It's not about your greatness as an architect, but your compassion.... What is important is using one's talent, intellect and energy in order to gain appreciation and affection for people and place. (Mockbee, n.d.)

To that end, the Rose Fellows are attempting to gain additional skills and to broaden the practice of architectural design through interpersonal skills development.<sup>2</sup>

To design good housing—housing that has a holistic, collaborative, and place-based design approach—and to achieve better health and an improved quality of life for residents, architects must address broad community needs and integrate transit infrastructure, energy efficiency, food access, and economic opportunity. We—the design profession, the millions of families we serve, the development organizations, and the financing organizations—need different types of designers. We need designers who can listen first. We need designers who can be patient and earn the trust of the people they serve. We need designers with fresh ideas and perspective who can lean on the families for whom they are designing to give guidance that speaks to their ambitions. These designers can give vision and voice to aspirations that they do not create but that they can fuel. Affordable housing design and construction can evolve when affordable housing designers and developers have evolved, to see the part and the whole, the individual and the community, the house and the neighborhood, and the past and the future.

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<sup>2</sup> Through a grant from the Fetzer Institute, Rose Fellows receive personal and professional communication skills training, but they have also received small individual grants for “collaborative actions” in the communities they serve.

## Acknowledgments

The author thanks Ryan McKeeman for his clarity of thought and language and the Enterprise National Design Team, especially Rose Fellows Colin Arnold, Jamie Blosser, Mike Chavez, Theresa Hwang, and Mark Matel, for sharing their stories.

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Katie Swenson, a member of the second class of Enterprise Rose Architectural Fellows, is Vice President for Design and Director of the Rose Architectural Fellowship at Enterprise Community Partners.

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# Point of Contention: Poverty Deconcentration

*For this issue's Point of Contention, we asked four observers with substantial knowledge of the topic to answer this question—“Should the deconcentration of poverty become one of the core objectives of federal housing policy?” Please contact [alastair.w.mcfarlane@hud.gov](mailto:alastair.w.mcfarlane@hud.gov) to suggest other thought-provoking areas of controversy.*

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# Getting Children Out of Harm's Way

Alexander Polikoff

Business and Professional People for the Public Interest

Society has long thought about poverty, at least since Charles Dickens indelibly pictured Oliver Twist's searing experiences. Focused thinking about "concentrated poverty," however, did not really begin until the 1987 publication of William Julius Wilson's *The Truly Disadvantaged*, which "revolutionized stratification research" (Clampet-Lundquist and Massey, 2008).<sup>1</sup> In the ensuing years, we have learned much about the effects of concentrated poverty, especially on young children. That learning should inform our response to the present point of contention.

Two recent books capture important parts of that learning: *Stuck in Place: Urban Neighborhoods and the End of Progress Toward Racial Equality*, by Patrick Sharkey (2013a), and *Great American City: Chicago and the Enduring Neighborhood Effect*, by Robert J. Sampson (2012). Taken together, the two books, which have been highly praised,<sup>2</sup> support the following propositions (among others).

1. Independent of personal characteristics, living in severely distressed neighborhoods has serious negative effects on residents'—especially children's—well-being.
2. The effects of neighborhood disadvantage in childhood continue to have strong impacts as children move into adulthood.

The "great neighborhood divide," as Sampson (2012) calls it, extends to many aspects of life that are "shaped by where you live" (Sampson, 2013), such as verbal skill development, exposure to violence, health, teenage pregnancy, and economic success.<sup>3</sup>

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<sup>1</sup> *Concentrated-poverty or high-poverty* areas are generally said to be those areas where poverty rates are 40 percent or more (Jargowsky, 2013). Because the effects of concentrated poverty begin to appear at the 20-percent rate, however, some scholars use 30 percent as the concentrated poverty threshold (The Annie E. Casey Foundation, 2012). According to U.S. census data, the number of high-poverty neighborhoods (40 percent poverty or more) has increased in recent decades. From 2005 to 2009, there were nearly 2.5 times the number of high-poverty neighborhoods as there were in 1970 (Jargowsky, 1997; Kneebone, Nadeau, and Berube, 2011), and both the number and the population of such neighborhoods have increased by 50 percent since 2000 (Jargowsky, 2013).

<sup>2</sup> William Julius Wilson says of *Stuck in Place* that it will become "a standard reference for students and scholars of inequality" (Sharkey, 2013a: book jacket) and of *Great American City* that it is "one of the most comprehensive and sophisticated empirical studies ever conducted by a social scientist" (Sampson, 2012: vii).

<sup>3</sup> Sharkey makes the additional point that the effects of living within a severely distressed neighborhood accumulate over generations, and that over multiple generations they are more severe than the effects of living in such a neighborhood at a single point in time, or even for a single generation.

These Sharkey and Sampson views are supported, directly or indirectly, by a large body of research. The well-known Adverse Childhood Experiences (ACE) study (Felitti et al., 1998) and the considerable literature it has spawned have disclosed the baleful effects of adverse childhood experiences on adult well-being.<sup>4</sup> Medical research on brain development in the very early years of life has discovered causal links between stress and trauma in early years and their lifelong effects.<sup>5</sup> The linkages between childhood stress and trauma and growing up in concentrated-poverty neighborhoods have been better documented.<sup>6</sup>

A familiar aspect of concentrated poverty is its racial overlay. For example, seven times as many African-American children live in high-poverty neighborhoods as do White children (The Annie E. Casey Foundation, 2013).<sup>7</sup> It is also familiar that the overlay is not accidental but results to a considerable degree from deliberate governmental actions and inaction, including in the realm of housing policy. This oft-told story is recounted in several classic studies.<sup>8</sup>

Among responses to the question of what to do about racially suffused, concentrated urban poverty for which governments are so largely responsible, two loom large in policy discussions. One (“neighborhood transformation” or “revitalizing”) is to improve concentrated-poverty neighborhoods; the other (“mobility”) is to enable residents to escape to better neighborhoods. Sharkey (2013a) urges that the former should be the primary approach. (Sampson [2012], although not making a formal recommendation, devotes most of his remedial discussion to revitalizing.)

There are at least two reasons to be unenthusiastic about Sharkey’s advice. First, the report card on revitalizing initiatives is disappointing. As many studies have shown, the fact is that, after countless tries, we have failed to demonstrate that we know how to revitalize severely distressed neighborhoods.<sup>9</sup>

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<sup>4</sup> The data show, for example, that a person with an ACE score of 4 is 4.6 times more likely to suffer depression as an adult than a person with a score of 0. A male child with an ACE score of 6 is 46 times more likely to use intravenous drugs in adulthood than one who scores 0 (Wylie, 2010). “ACERS,” as they are called, with a score of 6 or more die, on average, two decades earlier than those with a score of 0 (Wylie, 2010). Numerous peer-reviewed articles about the ACE study conclude that it demonstrates an astounding correlation between childhood adversity and many mental, physical, and social disorders that plague adults. See, for example, Corso et al. (2008) and Felitti (2002).

<sup>5</sup> See Garner and Shonkoff (2012), Shonkoff and Garner (2012), and Tough (2011). Many studies focus on particular effects. For example, on cognitive functioning see Badger (2013) and Johnson and Schoeni (2011), and on prospects for economic mobility see Florida (2013) and Leonhardt (2013).

<sup>6</sup> For example, in *The Hidden War*, a study of the Chicago Housing Authority’s effort to eradicate drug dealing in its projects, Urban Institute researchers say that resident children suffered the psychological trauma that comes from “living in guerrilla war zones like Cambodia or Mozambique” (Popkin et al., 2000: 27). William Julius Wilson’s (1987: 46) conclusion respecting “hundreds of studies on the effects of being raised in neighborhoods of concentrated poverty and deprivation” is that “concentrated poverty adversely affects one’s chances in life, beginning in early childhood and adolescence” (Barton and Coley, 2010: 30).

<sup>7</sup> The percentages are 28 and 4, respectively. Sharkey (2009: 10) finds that “thirty percent of black children experience a level of neighborhood poverty—a rate of 30 percent or more—unknown among white children.”

<sup>8</sup> See, for example, Hirsch (2000); Jackson (1985), especially chapters 11 and 12; and Massey and Denton (1993).

<sup>9</sup> See, for example, DeLuca and Rosenblatt (2013), Greenberg et al. (2010), and Kubisch et al. (2010). “There is no equivalent evidence [to that respecting mobility programs]... that a sustained effort to reduce concentrated poverty by investing in neighborhoods, rather than moving residents out, will have a positive impact on the residents of disadvantaged neighborhoods” (Sharkey, 2013a: 139).

Second, revitalizing is not a stand-alone policy. Sharkey (2013a) acknowledges that revitalizing efforts are unlikely to be effective on their own, citing numerous attempts that have been overwhelmed by broader economic, political, and demographic forces. They require, he says, an array of supporting investments in health, government jobs, transportation, criminal justice, policing, regional government, immigration policy, and research and development; revitalizing efforts that lack these investments are “doomed for failure.” The likelihood of assembling this array of costly, challenging public policy initiatives is a matter on which Sharkey does not opine because, he says, he lacks political expertise.

On the other hand, studies of the Gautreaux mobility program showed strikingly favorable outcomes for families who, with housing vouchers, were enabled to escape concentrated-poverty neighborhoods in Chicago.<sup>10</sup> Given such results, why does Sharkey relegate residential mobility to secondary status as a way to confront the challenges of concentrated-poverty neighborhoods?<sup>11</sup>

One reason is Sharkey’s concern that moving families might cluster together in receiving communities to form new pockets of concentrated poverty. Sharkey (2013a), however, acknowledges that there is an “ideal scenario” that would avoid this result—nothing more complicated than seeing to it, as was done in the Gautreaux program, that families move in patterns that do not form new pockets of poverty. Sharkey does not explain his implicit rejection of the ideal scenario.

A second reason is Sharkey’s “tentative” conclusion that residential mobility programs work well with families moving only from the very worst neighborhoods, not from a wider range of poor neighborhoods. Even if this were true, it would not explain why mobility programs should not be widely employed in the very worst neighborhoods, of which there is no shortage.<sup>12</sup>

Finally, Sharkey (2013a) expresses concern about the amount of political will it might take to mount a large-scale residential mobility program. Surely, however, at least as much political will would be required to assemble the array of investments Sharkey considers essential to revitalizing.

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<sup>10</sup> The outcomes were especially robust for children. For example, children of families who had moved to suburbs were four times more likely than those of families who had moved within the city to finish high school and twice as likely to attend college (Rubinowitz and Rosenbaum, 2000).

<sup>11</sup> The question is made more acute by Sharkey’s (2013a) acknowledgment that revitalizing may lead to economic but not necessarily to schooling benefits, and that it is with mobility, not revitalizing, that children’s academic and cognitive scores have been shown to rise. This result is unsurprising, because “revitalizing children” generally continue to attend the same schools, whereas “mobility children” generally enter better ones.

<sup>12</sup> See footnote 1 about the growing number of high-poverty neighborhoods. In both Gautreaux and the Moving to Opportunity for Fair Housing (MTO) demonstration, families who experienced positive outcomes came from a wide range of poor neighborhoods (Rubinowitz and Rosenbaum, 2000; Turner et al., 2012). Because MTO families failed to show the economic and educational gains registered by Gautreaux families, “MTO publications and presentations appear to have cast doubt on the general thesis that neighborhoods matter in the lives of poor individuals” (Sampson, 2008: 191), the “thesis” that is of course the very predicate for mobility. The doubt is unjustified, for most MTO families did not move to and remain in true opportunity areas. “I ... conclude that while neighborhood poverty differs, as intended [between MTO treatment and control families], in the end MTO experimental differences are marginal overall and unfolded within similar structural contexts of concentrated disadvantage” (Sampson, 2008: 205) See also Clampet-Lundquist and Massey (2008). A study of MTO families who did spend substantial time in neighborhoods with low poverty and higher education levels showed that these families experienced positive economic and educational outcomes that were not only statistically significant but meaningful in size, outcomes said to be “roughly consistent” with Gautreaux findings (Turner et al., 2012).

(Indeed, ideal scenario, Gautreaux-type programs might well be more politically feasible than mounting simultaneous programs encompassing transportation, criminal justice, regional government, and all the other initiatives said to be requisite for successful revitalizing.)

Thus, although *Stuck in Place* concludes that revitalizing should be the primary way to confront concentrated urban poverty, the book's own analysis would seem to compel a different conclusion. Sharkey himself says that mobility programs that target families in the most disadvantaged neighborhoods and provide them with sustained supports "fit" his agenda.<sup>13</sup>

The notion of confronting the challenges of concentrated urban poverty with a large-scale mobility program may smack of indulgent fantasy. Doesn't the American polity lack the political stomach for facilitating the movement of large numbers of African-American families from severely distressed neighborhoods to low-poverty, predominantly White communities? Maybe. Still, history is full of surprises. Truman beat Dewey. The Civil Rights Movement ended generations of seemingly impregnable Jim Crow in one decade. Nixon went to China. History teaches that surprises emerge from what, in retrospect, is seen as exactly the right combination of particulars assembled at exactly the right moment.

Today, an African American occupies the White House. Interracial marriages grow apace. The racial and ethnic makeup of the nation is changing rapidly. Adverse childhood experiences are frequently cited as America's number one public health issue (Wylie, 2010). Nobel Laureate economist James Heckman explains over and over that investment in early childhood pays big dividends (Heckman et al., 2010; Knudsen et al., 2006).<sup>14</sup> Enabling young children to move from toxic environments with poor schools to safe neighborhoods with good ones is an obvious way of "investing" in early childhood. Are these and other particulars assembling for yet another surprise?

Perhaps not, but a story from England seems relevant. For many years, a small group of scientists carried out research on health inequalities. The research was called "pure" because the scientists were not policymakers, and the conservative Thatcher Administration, then in office, could not have been more disinterested. When Tony Blair came to power in 1997, however, the research was retrieved from the dusty shelf to which it had been consigned, and a number of its recommendations soon became national policy (Marmot, 2004).

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<sup>13</sup> In an interview, Sharkey (2013b) described the Gautreaux program as an example of a "durable" urban policy, his highest accolade. *Stuck in Place* (2013a: 172) says that any comprehensive policy "must combine elements from each approach" and adds that there is "substantial overlap in policies that might be considered 'mobility' approaches with those that might be classified as 'investment' approaches." Honorable antecedents to "combining" include both Martin Luther King, Jr., and the Kerner Report. (See Sharkey, 2013a.) Mobility of course has the great advantage of immediacy. Moving families gain instantaneous access to better schools and safer neighborhoods whereas, at best, revitalizing takes a very long time. While families await its far-from-certain benefits, children are accumulating ACE scores likely to blight their adult lives.

<sup>14</sup> Heckman's work provides a definitive response to arguments that enriched mobility counseling—enough to make it truly effective—would be too costly. (As if revitalizing were a cheaper alternative.) The costs to society of the blighted adult lives that are the ongoing consequence of concentrated poverty are incalculably high. The persisting African American-White education gap illustrates but one of those costs; numerous studies point to the dire economic consequences in our information and technological age of a poorly educated work force (PISA, 2010). "Yet without integrated education," says Richard Rothstein, an acute observer of the educational scene, and his coauthor, "we have little hope of remedying the educational struggles of the 'truly disadvantaged,' [and without] integrating residential neighborhoods, we have little hope of integrating education" (Rothstein and Santow, 2012: 2).

In like vein, while supporting and expanding current mobility programs, we should also be conducting “pure” research on mobility. Apart from Gautreaux and the Moving to Opportunity demonstration, there have been sizable mobility programs in Baltimore and Dallas, smaller ones elsewhere. We should be learning from these experiences how to do mobility really well: how to deploy the ideal scenario to avoid creating new pockets of poverty and negatively affecting property values; how to administer programs so that moving families are not perceived as threatening; how to obtain enough homes and apartments in good neighborhoods; how to identify precisely what we mean by “good neighborhoods”; how to ameliorate the isolation of African-American parents and supply the assistance needed to enable them to remain and thrive in new places; how to maximize the chances of success for children entering higher standard schools; and so on. Like the research on health inequalities, the research on mobility should, when completed, be carefully preserved, ready to be retrieved when the politically propitious moment arrives.

Given that concentrated urban poverty has devastating, long-lasting effects on those who live within it, especially on young children; given that these effects are seriously harmful to the nation as a whole; given that they are suffered disproportionately by minorities, especially African Americans; and given that decades of deliberate government actions, including in government housing programs, significantly contributed to that disproportion—should not the point of contention have been, “Why on earth should the deconcentration of poverty not be a leading objective of federal housing policy?”

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# The Unintended Imposition of Housing Deconcentration?

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For years, policy analysts and the current Secretary of Housing and Urban Development have offered the reply to the question of how deconcentration fits as part of federal housing policy objectives: use deconcentration whenever appropriate, along with supply-side or place-based improvements, in a multifaceted strategy to address poverty (Briggs, 2008; DeLuca, 2012; Galster, 2013; Goering and Feins, 2008; Sharkey, 2013). Voluntary mobility (Goetz, 2002), in some form and degree, needs to be among the alternatives offered to low-income residents receiving housing assistance, if only because of the substantial levels of harm and fear often caused by living in deeply poor communities. Although not a silver bullet, voluntary mobility is among the critical tools that government and the nonprofit worlds should continue to engage in as they pursue comprehensive, effective, and equitable outcomes for cities, neighborhoods, and poor households.

We now know that the utility and effectiveness of deconcentration programs appear likely to vary according to the presence and power of certain structural and programmatic issues, the relevance of which are better understood now, two decades after the U.S. Department of Housing and Urban Development (HUD) launched its first major experimental deconcentration effort. In the approximately two decades since Congress authorized funding for HUD's experimental deconcentration effort, the Moving to Opportunity for Fair Housing (MTO) demonstration program, we have learned a good deal from the criticism, commentary, and new research generated that now enable us to more critically examine what dispersal is best suited to accomplish, its limitations, and its probable effects on families (Briggs, Popkin, and Goering, 2010; Goetz, 2002; Imbroscio, 2012, 2008; Ludwig, 2012; Massey et al., 2013; Oreopoulos, 2003; Sampson, 2012; Sharkey, 2013).<sup>1</sup> HUD's own contribution to neighborhood effects research has generated a wave of social science investigations of mobility, race, and neighborhoods that is only now available to planners and analysts. This research curiosity, built on the foundations laid by William Julius Wilson and Douglas Massey, has now generated a clearer view of the structural or systemwide resistance to large-scale poverty relocation.

In the short space allotted, I focus on four obstacles: (1) the reduced funding and support for federal programs, (2) that such reductions have been long term and harmful, (3) that opportunities have

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<sup>1</sup> Before returning to the university, I was the career project manager (or government technical representative) for MTO beginning in the early 1990s and designed, wrote, or collaborated on all the Requests for Proposals, Indefinite Quantity Contracts, and congressional reports that allowed for MTO and its research to be funded and completed, subject of course to review and approval by political appointees.

been shown to vary considerably across metro areas, and (4) that race continues to matter often quite profoundly. These constraints now more clearly appear to affect the chances for large-scale successful deconcentration of poverty. I, too, focus on the “under-theorized ... role of structural factors” (Goetz and Chapple, 2010: 225–226) in generating the benefits and harms of concentrated poverty (also see Galster, 2013). Such constraints have limited HUD’s ability to promote wide-scale deconcentration, along with its other missions. Unlike in the late 1980s, when most of us knew little about the conditions for successful poverty dispersal, we are now a bit wiser in identifying “which causes matter most” and “what types of effects can reasonably be expected from a dispersal strategy” (Goetz and Chapple, 2010: 227).

## **Funding and Support for Federal Programs Have Declined**

My focus begins on the structural impediments to adequately fund HUD’s missions, including the chances for supporting large-scale poverty deconcentration. We have recently seen limited prospect for federal funding adequate to the increasing needs for housing assistance this country faces, including a dwindling willingness to finance equitable development options for poor communities. Mann and Ornstein (2012), in *It’s Even Worse Than It Looks*, argued that Washington’s partisan “asymmetric” polarization significantly limits options for fiscal change and reform. The “dysfunctional politics” of recent Congresses, for example, led to the creation of budget sequestration that nonsurgically cuts nonentitlement funding for agencies like HUD (Naim, 2013; Ornstein, 2013). This “fiscal doomsday machine” (Krugman, 2013), established in the Budget Control Act of 2011,<sup>2</sup> limits the discretionary federal budget up through 2024, most probably imperiling plans for either mobility or place-based redevelopment at anything like a comprehensive national scale.

Congress’s actions are at least partially connected to popular views of the federal government. As one illustration, a 2011 Gallup poll revealed large increases in the percentage of Americans who now state that “the federal government poses an immediate threat to the rights and freedoms of ordinary citizens” (Saad, 2011). The percentage increased from 30 percent in 2003 to 49 percent in 2011; astonishingly, one-half of all Americans believe the federal government is out to hurt them. How do you create national plans for new initiatives when this distrust or contempt may affect support for aggressive federal initiatives aimed at reducing persistent racial and income inequality (Massey, 2007)?

## **Funding Reductions Have Been Long Term and Harmful**

Funding constraints are not new. For example, a recent research report noted: “Funding for public housing fell 12 percent between 2008 and 2012. Compared with two years earlier, appropriations for the HOME program in fiscal 2012 were down by 45 percent while those for the Community Development Block Grant program were down by 26 percent” (JCHS, 2013: 4).<sup>3</sup>

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<sup>2</sup> Public Law 112-25.

<sup>3</sup> The United States of course faces other comparably pressing needs for funding, including funding for food assistance, funding for environmental protections, and, as noted by the American Society for Civil Engineers in 2013, funding for an estimated \$3.6 trillion before 2020 for repairs to U.S. bridge and other infrastructure systems. See <http://www.cnbc.com/id/101214258>.

The cumulative negative effect of such long-term budget reductions on the affordable housing stock can be illustrated with a January 2014 NBC *Dateline* series, “Breathless.” The program focused on the effects of budget cuts within a previously well-maintained (Bloom, 2008) New York City Housing Authority (NYCHA) on the asthma condition of one tenant’s child.<sup>4</sup> In this program, a mother with a seriously ill, asthmatic child fights for more than a year to get the black mold and leaking plumbing fixed in her public housing apartment. She succeeded after many months with numerous calls to local media. Her apartment was repaired, but an acknowledged backlog of nearly 20,000 other repair requests remains, because the NYCHA has a huge deficit of funding for capital repairs for its 180,000 apartments in more than 2,500 buildings.

A recent study (HR&A Advisors, Inc., 2013) estimated the cost to repair NYCHA’s stock to a basic level of livability. The costs range from a minimum of \$12 billion to a more complete cost of \$23 billion, averaging roughly \$100,000 per unit, not including the costs of addressing the needs for resilience adaptation forced to the front by flooding in the wake of Hurricane Sandy (HR&A Advisors, Inc., 2013).<sup>5</sup> For fiscal year 2014, however, Congress allocated only \$4.4 billion for all the public housing operating costs across the United States and another \$1.87 billion for all capital funding needs (NLIHC, 2014). Accumulating the total U.S. funding (inflation adjusted) for 15 years would then cover only one agency’s repair needs.

The policy concern becomes then not whether voluntary deconcentration should be a leading goal of federal housing policy, but whether the physical deterioration of the low-rent housing stock might cause residents to involuntarily move out of buildings as they become uninhabitable, demolished, or too expensive to afford as public housing authorities (PHAs) are forced to raise rents. Might the systematic short-changing of the capital needs of public housing, linked to rent reforms coupled with persistent budget cutbacks, create forced or unplanned deconcentration? Might HUD then be blamed for such poverty dispersal as the public reacts, analogously, to their rejection of MTO in Baltimore 20 years ago, creating further downward pressures on support for urban redevelopment?

## **Opportunities Vary Notably Across Metropolitan Areas**

So much of what we knew in social science and policy terms about spatial deconcentration programming in the late 1980s was based on a single city, Chicago, because of the power of the Gautreaux precedent (Polikoff, 2006). We now have learned how variable opportunities can be across metropolitan areas. Chetty et al. (2014), for example, showed us how options for social mobility differ across metropolitan areas, echoing Sharkey’s (2013) analysis of how cities differ in the degree to which they experience declining disadvantage. It is now also much clearer that the suburbs, which some thought offered assured opportunities, are now experiencing more poverty and racial change

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<sup>4</sup> See <http://www.nbcnews.com/video/dateline/53992710#53993240>.

<sup>5</sup> This cost estimate is substantially higher than HUD’s 2010 estimate (Abt Associates Inc., 2010) for NYCHA of repair needs of \$30,000 per unit. For the country as a whole, Abt estimated a backlog of repair needs of \$25.6 billion, or \$23,300 per unit, with 20-year accrual needs of \$89 billion, or roughly \$82,000 per unit. NYCHA has not hidden its deep concern: “Funding for capital improvements has been in steady decline for a decade. This chronic capital funding gap has placed the public housing asset in jeopardy” (NYCHA, 2013: 8).

than had existed in the late 1980s (Kneebone and Berube, 2014). If we had been aware of the actual or pending power of such metropolitan differences in racial and neighborhood disadvantage, we might have been more strategic in selecting communities for MTO that could more ably reveal neighborhood-related effects.

## Race Continues To Matter, Profoundly

To no one's great surprise, race continues to serve as a powerful obstacle to opportunities (Quillian, unpublished). Recent research has sharpened our awareness of multigenerational ways in which race-related obstacles limit the chances for successful deconcentration. Sharkey's *Stuck in Place* (2013) shows us how limited the chances are for most African Americans to make it out of the ghettos into which they and their predecessors were born. Sampson (2012), too, reveals the social and spatial pressures on the residential mobility trajectories in Chicago and how much mostly African-American MTO families were constrained by those forces. The middle-income neighborhoods into which many MTO families initially moved have now been shown to be uniquely vulnerable, thence minimizing African Americans' chances for upward mobility and increasing their chances of moving downward.<sup>6</sup>

Among the results of research involving the largely minority families engaged in the MTO demonstration (Briggs, Popkin, and Goering, 2010) was that most suffer from a poverty of awareness and information about their options, potential opportunities, and resources that might be available to aid them. Racial concentration serves to obstruct or block the flow of information about the choices of which families should be aware, for themselves and their children. It appears inevitable then that any larger scale implementation of deconcentration needs to find locally framed, innovative means of addressing this effect of ghettoization.

## Final Thoughts

It was necessary, I would argue, ethically and policy- and research-wise, for HUD in 1990 to try for the first time to learn if modest levels of voluntary mobility into better-off communities would help the lives of participants. The social experiment did that, although not in the ways that the Gautreaux myth had predicted (Ludwig, 2012; Oreopoulos, 2003). If Congress continues to eat away at funding for the core stock of public housing apartments, public housing may become as uninhabitable as that from which MTO families chose to escape in fear for their lives. Deconcentration might become increasingly involuntarily and structurally determined by factors over which HUD, local PHAs, and residents will have little to no control.

Evidence and ideas, however, suggest how new programs and innovation might occur. Massey et al.'s (2013) research on Mt. Laurel scattered-site housing shows us that substantial economic and social benefits for its residents can emerge. Galster (forthcoming), too, shows some modest employment effects from Denver's scattered-site program. The agencies engaged in the Moving to Work demonstration program also have been encouraged to undertake innovative programs,

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<sup>6</sup> "If the most powerful effects of neighborhoods stem from exposure in prior generations ... it is perhaps not surprising that research from mobility programs has generated inconsistent and relatively small impacts" (Sharkey, 2013: 134).

which are yet to be carefully studied (OIG, 2013). The recent inclusion in the 2014 budget of provisions to encourage building PHA consortia is another possible vehicle for innovation and cost sharing. The best and most creative ideas the Barack Obama Administration has already had in innovatively aiding low-income areas—the Choice Neighborhoods Initiative and Promise Zones—have, however, been starved for funding. In May 2013, HUD was able to allocate roughly \$120 million for the entire nation for its Choice Neighborhoods Initiative, far from the budget needed to tackle all the tasks targeted. In 2014, Congress allocated enough funding for only 20 such communities (Shear, 2014)<sup>7</sup> despite Sharkey's (2013: 162) results, which showed that “the economic fortunes of black youth improve, and improve rather substantially . . . when neighborhood disadvantage declines.”

Positive lessons are to be learned from such programs that can also aid us all as we wait for the country to fund its commitment to equitable, affordable housing for the poorest among us. If not, racially framed urban inequality will only deepen the divides that already plague our cities and suburbs. Thus, the pessimist in me answers the question posed to us that deconcentration might well be forced on us. The optimist argues that alternatives exist.

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<sup>7</sup> [http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/comm\\_planning/economicdevelopment/programs/pz](http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/economicdevelopment/programs/pz).

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# Pursuing Poverty Deconcentration Distracts From Housing Policy Reforms That Would Have a Greater Effect on Poverty Alleviation

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The federal government has multiple housing policies to pursue multiple goals. For example, it promotes homeownership primarily through provisions of the individual income tax. If the federal government were to promote poverty deconcentration, it would almost surely do it through its low-income housing programs. Therefore, I focus on whether these programs should be altered to promote this objective.

Low-income housing programs certainly could be modified to promote poverty deconcentration. The Moving to Opportunity for Fair Housing (MTO) demonstration did it by offering one treatment group a housing voucher on the condition that recipients live in a neighborhood with a poverty rate of less than 10 percent for at least 1 year. The U.S. Department of Housing and Urban Development's (HUD's) current Small Area Fair Market Rent Demonstration Program is doing it by offering higher subsidies in its housing voucher program in ZIP Codes within a metropolitan area that have a higher median gross rent. Higher subsidies could be based on the area's poverty rate. The federal government could also promote poverty deconcentration through its programs that subsidize the construction of privately owned housing projects by giving weight to the poverty rate in the proposed neighborhood in deciding which projects to fund.

The primary reason that many have argued that poverty deconcentration should be a leading goal of federal housing policy is their belief that it would greatly benefit the poorest people. For example, it would enable children from poorer families to attend better schools and this access would lead to better outcomes for them as adults. Many share the goal of helping these people. The question is how to pursue it.

A recipient of assistance has a simple answer to this question. He or she prefers a cash grant without any restrictions on its use. The recipient generally prefers an unrestricted cash grant to any program that contains special incentives to make particular choices. To justify assistance with restrictions or incentives for particular choices, nonrecipients must prefer it to an unrestricted cash grant for some reason.

Because nonrecipients bear the cost of providing assistance, their preferences are relevant for deciding on its nature. The traditional argument for low-income housing assistance has been that people with higher incomes want to help low-income families and believe that the decisionmakers in some of these families undervalue housing for themselves or their children. This argument calls for providing assistance that induces these recipients to occupy better housing than they would choose if they were given equally costly unrestricted cash grants. The existence of minimum housing standards in all low-income housing programs reflects this sentiment. Another important argument is that people with higher incomes care about the children in these households and think that their parents devote too little of the family's resources to their children. Providing housing assistance rather than unrestricted cash grants to these families directs more of the assistance to the children. Similar arguments could be used to justify providing incentives for recipients of low-income housing assistance to live in low-poverty neighborhoods.

The evidence that has been offered in support of government action to promote poverty deconcentration does not address the key questions; for example, it does not address whether low-income households undervalue the advantages of living in a neighborhood with a lower poverty rate. Instead the evidence deals with the magnitudes of certain effects of living in such a neighborhood. To the best of my knowledge, no attempt has been made to compare the estimated magnitudes of these effects with perceptions of these magnitudes held by low-income individuals.

Even when low-income individuals have correct perceptions of the effects of living in a low-poverty neighborhood, individuals with higher incomes might think that they undervalue the benefits of doing it. It is not at all clear, however, that many higher income individuals share this sentiment. Many may recognize the advantages of living in a high-poverty neighborhood that offset its disamenities for those who live there. A high-poverty neighborhood might be closer to friends and relatives; for example, it may be much closer to a relative who takes care of a young child while the mother is at work or might be closer to a particular person's best job option. Importantly, identical housing in a low-poverty area costs more and hence requires occupancy of worse housing or less consumption of other goods.

The best evidence suggests that the benefits to low-income households of living in a low-poverty neighborhood are small. The most directly relevant evidence comes from a comparison of the outcomes of MTO's two randomly selected treatment groups. MTO offered members of one group regular Section 8 housing vouchers and members of the other group the same vouchers with the additional restriction that the recipient must live in a census tract with a poverty rate of less than 10 percent for the first year. MTO studied a wide range of outcomes—labor earnings, educational achievement, mental and physical health, risky and criminal behavior, and others. The differences in outcomes between the two groups were modest (Orr et al., 2003; Sanbonmatsu et al., 2011). Other studies of the highest quality and excellent recent surveys of the literature reach similar conclusions (Ellickson, 2010; Levy, McDade, and Bertumen, 2013; Oreopoulos, 2003). One reason for the minimal benefit to low-income households of living in a low-poverty neighborhood is that interactions among residents with different incomes have been very limited (Levy, McDade, and Bertumen, 2013).

I conclude that poverty deconcentration should not be a leading objective of federal housing policy because its benefits to the poor are modest, it is highly controversial, and it distracts attention

from important reforms of low-income housing policy that would provide substantial help to low-income households. Instead of devoting scarce attention to new objectives of limited value, the federal government should be trying to achieve its original objectives in a more cost-effective and equitable manner. Pursuing this new objective distracts from the main task at hand, namely, delivering more help to the poorest members of society with the limited resources available. Low-income housing assistance is fertile grounds for such reforms (Olsen, 2008).

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# The Smokescreen of Poverty Deconcentration

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Should the deconcentration of poverty be a leading objective of federal housing policy? No.

Deconcentrating poverty is a smokescreen. It camouflages forced relocation of low-income households. What do we mean when we talk about *deconcentrating poverty*? As it has been implemented to date, deconcentration has meant manipulating the spatial arrangement of federally subsidized low-income families to either disperse or dilute poverty. Dispersal is accomplished through (1) providing vouchers to subsidized families who wish to move out of subsidized developments that have concentrations of poverty, or (2) forcing the movement of subsidized families through the demolition and redevelopment of their subsidized communities. Dilution is accomplished through redevelopment that reduces the number of low-income subsidized units in a given site and mixing them with units to be occupied by middle-class households induced into moving in. Thus, although *deconcentrating poverty* has the sound of a sweeping and comprehensive effort, in reality it is much less than that. In the end, it is simply the spatial rearrangement of federally subsidized low-income households.

Federally sponsored poverty deconcentration initiatives have had this narrow focus, despite the fact that we can imagine a much wider range of policy options to deconcentrate poverty. For example, we might mount an assault on the restrictive and exclusionary practices of predominantly affluent White communities, but we have not done so at the federal level, nor have we used federal resources to support state and local efforts in that area. We might otherwise mandate that these exclusionary communities accept subsidized very low-income households. Such a mandate has never been made, nor have we used federal resources to support such an approach at the state and local levels. We could force middle-class or affluent households to move to achieve income mix, but we have not done so. We could impose restrictions on private-sector housing developers to ensure income mix wherever they build, but again, we have not done so at the federal level, and we have made no significant effort to use federal resources to support the few inclusionary housing programs that exist at the state and local levels.

Readers may argue that these ideas are out of the realm of what is possible politically, no matter how much they might help to create income mix. I agree. They have not been pursued because they are political nonstarters, and they are highly unlikely to be pursued in the future for the same reason. For example, who among you envisions the federal government limiting the mortgage interest deduction to people who live in mixed-income neighborhoods? Yet, making housing assistance for very low-income people contingent on income mix is widely advocated. As long as these political



constraints on the grand idea of deconcentrating poverty exist, we will continue to see limited initiatives that have the effect of merely relocating very low-income, subsidized housing residents.

The difference between the Moving to Opportunity for Fair Housing (MTO) demonstration program and the HOPE VI Program is instructive here. MTO was designed to facilitate the voluntary mobility of very low-income families who wanted to move to low-poverty neighborhoods. No other direct benefits were forecast as a result of the program other than the improvements to the lives of the families who participated. The MTO program was defunded in its second year, abandoned because of opposition from middle-income communities who thought they might be harmed by it. HOPE VI, on the other hand, was critically different from MTO in two important ways. First, public housing residents displaced by the program were not guaranteed a move to a low-poverty neighborhood. Indeed, as the research shows, just the opposite occurred—most families moved to other segregated and poor neighborhoods. Thus, HOPE VI avoided generating the same backlash from middle-income communities that MTO produced. Second, HOPE VI incorporated physical redevelopment of public housing communities, generating a supportive constituency for the program by producing benefits to property owners, investors, place-based entrepreneurs, large developers, and local officials. Property owners and investors could capitalize on the latent land value that had been suppressed by the existence of public housing, and local officials appreciated the increased property values and decreased service needs in the community post redevelopment. The HOPE VI Program that forced the displacement even of families who did not wish to deconcentrate lasted for two decades and, when it ended, it was replaced with a similar program. MTO, which was voluntary and therefore proceeded without burdening low-income families, was eliminated in 2 years. The fate of these programs had little to do with how they treated very low-income people and had everything to do with how they related to nonpoor constituencies.

So, for the sake of accuracy, we need to eliminate the phrase *deconcentrating poverty* because it obscures what we are really talking about. Let us call this initiative what it is: relocating poor people in ways that do not offend or alienate the nonpoor.

Deconcentration programs (including MTO and HOPE VI) have been disappointments, furthermore, even on their own terms. The record is pretty clear. Years of research on the MTO program shows that benefits were limited to participants leaving the most extreme conditions of neighborhood deprivation (Sharkey, 2013). Even then, the benefits they experienced did not extend to income or economic security. Other participants, on the whole, did not show benefits from the program. Research from across the country on HOPE VI has also documented a lack of consistent benefits (Goetz and Chapple, 2010). The pattern of benefits to these families is modest, inconsistent, and balanced by measurable costs as well. Most important to note in this discussion is that forced relocation has failed to result in improved economic security, while undercutting the informal support networks that the poor rely on. Benefits of relocation tend to be experienced by the subset of families who were anxious to leave in the first place (Goetz, 2010). Several explanations for why dispersal has failed to produce the expected results range from an incomplete theory of poverty in the first place to poor translation of theory into policy and to poor implementation (Goetz and Chapple, 2010).

We call displacement and redevelopment *deconcentration*, even though most displaced families simply move to other high-poverty neighborhoods. Very few of the original residents make it back

to enjoy the benefits of redevelopment. As the Urban Institute reported, the only intervention that most residents experienced in HOPE VI was the forced relocation from their homes (Levy and Woolley, 2007).

The only possible basis for calling deconcentration a success is the redevelopment benefits that have been generated. For example, Bruce Katz has called HOPE VI “the most successful urban redevelopment initiative of the past half-century” (Katz, 2009: 15). Setting aside for the moment that that is a pretty low bar, one is prompted to ask, “successful for whom?” City officials who wished to quickly shift large swaths of land into sites of tax revenue generation certainly benefited, as did the private developers and investors whose renewed interest in the affected neighborhoods coincided with the elimination of the old subsidized housing communities. The relocated residents have not benefited nearly so much.

As Sharkey (2013: 175) noted, “...it is time to discard the idea that moving large numbers of families out of the ghetto can be a primary solution to concentrated poverty.”

Deconcentrating poverty diverts attention and resources away from adequately addressing poverty. Intervening factors, such as human capital endowments, health, access to supports (including transportation and informal social network supports), are not addressed by deconcentration and are preconditions for economic mobility. Addressing poverty directly through investments makes better use of the federal government’s resources in these preconditions rather than forcing a change of address for very low-income subsidized families.

Regarding mobility, policymakers should focus on enhancing choices, not forcing a particular choice on recipients of assisted housing. Most of the research shows that the most highly motivated to move are the ones who experience the most benefits from deconcentration. The role of the federal government should therefore be to facilitate, to the extent possible, the moves of families who wish to move, while continuing to provide assistance to those who wish to remain.

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# Departments

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## **Data Shop**

*Data Shop, a department of Cityscape, presents short articles or notes on the uses of data in housing and urban research. Through this department, the Office of Policy Development and Research introduces readers to new and overlooked data sources and to improved techniques in using well-known data. The emphasis is on sources and methods that analysts can use in their own work. Researchers often run into knotty data problems involving data interpretation or manipulation that must be solved before a project can proceed, but they seldom get to focus in detail on the solutions to such problems. If you have an idea for an applied, data-centric note of no more than 3,000 words, please send a one-paragraph abstract to [david.a.vandenbroucke@hud.gov](mailto:david.a.vandenbroucke@hud.gov) for consideration.*

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# **The Smart Location Database: A Nationwide Data Resource Characterizing the Built Environ- ment and Destination Accessibility at the Neighborhood Scale**

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## **Abstract**

*A large body of research has demonstrated that land use and urban form can have a measurable effect on the daily transportation habits of urban and suburban residents. These findings can help to inform travel demand studies and evaluations of the likely effects of land use decisions on residents' transportation choices and costs. Developing reliable data can be expensive and time consuming, however. The goal of the U.S. Environmental Protection Agency's Smart Location Database (SLD) is to summarize relevant built environment and destination accessibility variables for every census block group in the nation and to share them publicly in support of planning and research studies nationwide. This article describes the variables available in the SLD and the novel approaches we developed to calculate these variables using available private and*

### **Abstract (continued)**

*public data sources. Of particular note are several measures of accessibility to destinations via transit developed through an analysis of more than 220 public transit data feeds available from agencies across the United States. The article concludes with a case study describing one current use of the SLD: evaluating potential employment facility locations.*

## **Introduction**

During the past two decades, the planning profession has seen an explosion of interest in the roles that land use and urban design play in shaping the transportation habits, health, and livelihood of urban and suburban residents. Researchers in the fields of transportation planning and public health have begun to isolate and measure the relationships between the built environment in which we live and work and our propensity to choose walking, transit, or driving to meet our everyday transportation needs. These studies tend to focus on neighborhood characteristics such as the density of development, mixing of land uses, connectivity of street networks, availability of transit, and accessibility to destinations via car, transit, or foot. A 2010 meta-analysis of this literature reviewed more than 200 different studies (Ewing and Cervero, 2010). Findings from this body of research are being used to inform traffic impact analyses (Ewing et al., 2011; Gulden, Goates, and Ewing, 2013), land use scenario-planning studies (Bartholomew and Ewing, 2008), environmental impact analyses (Ramsey and Poresky, 2013), health impact assessments (de Nazelle et al., 2011), and estimates of transportation cost burdens associated with living in a particular place (Haas et al., 2008). These kinds of studies enable planners and community advocates to quantify the potential benefits of local land use decisions such as encouraging compact and mixed-use development, allowing for more jobs and housing to be in walkable and transit-rich neighborhoods, and reducing the amount of new low-density development occurring at the outer suburban fringe.

Developing data that summarize built environment characteristics unfortunately can be expensive and time consuming. Moreover, each time a new community wants to conduct a planning study, the same general kinds of data must be identified, gathered, and processed. We wondered, therefore, if an economy of scale could be achieved by developing data about the built environment at the block group scale for the entire United States. These data would necessarily rely on national sources or widely used data standards. Therefore, the results could be inferior to locally derived metrics that rely on detailed land use data available only at the local scale. We hypothesized, however, that a nationwide study could produce data that are sufficient for many local and regional studies that would not otherwise move forward because they lack resources. We also hypothesized that making nationally consistent data freely available could spur the development of third party planning analysis tools that significantly reduce barriers to entry for communities seeking to analyze the potential effects of land use decisions.

It is not surprising that summarizing neighborhood-scale built environment characteristics using only nationally available data involves significant challenges. Most notable among these challenges



is the lack of a publically available database that describes the location and use of privately owned land parcels. Therefore, an analysis seeking to summarize the density of commercial development, mix of land uses, or availability of destinations must derive these metrics from proxies such as job counts broken down by employment sector. Similar challenges affect the ability to accurately model pedestrian mobility and transit service. Our study is the first attempt to navigate such challenges to reliably summarize neighborhood-scale built environment conditions for the entire United States.

## **Developing the Smart Location Database**

The U.S. Environmental Protection Agency's (EPA's) Smart Location Database (SLD) includes more than 90 variables summarizing conditions for every census block group in the United States. It is broken into 10 topic areas: administrative, area, demographics, employment, density, diversity (of land use), design, transit service, destination accessibility via automobile and via transit, and regional summaries. All administrative, demographic, and employment variables came directly from the 2010 U.S. census, 2006–2010 American Community Survey (ACS) 5-year estimates,<sup>1</sup> or 2010 Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics.<sup>2</sup> Other variables required additional analysis. A full listing of all variables, including data sources, is available in the appendix.

It is beyond the scope of this article to fully describe the method of derivation for every variable in the SLD. Such information is available in the “Smart Location Database User Guide” (Ramsey and Bell, 2013). In this article, we describe our derivation approach and some key challenges we navigated on the way.

### **Density**

One common drawback of calculating the density of population, housing, or employment using only census data is that any given block group may contain both developed and undeveloped land area. Block groups may also include parks or other areas protected from development activity. As a result, average block group density may differ substantially from the actual density of development experienced by residents and visitors. To address this problem, we obtained data from the Protected

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<sup>1</sup> ACS 5-year estimates are derived from survey data collected during a 5-year period to ensure a large enough sample size in smaller geographic units. Therefore, the data released reflect conditions during a 5-year period. The census also releases margins of error for all ACS data values. These margins of error can be quite large for individual block groups, in some circumstances. Users of the demographic data available in the SLD are encouraged to consult the ACS to assess the accuracy of estimates. Most variables in the SLD are not derived from ACS data.

<sup>2</sup> LEHD data summarize employment at the census block level for all U.S. states except Massachusetts. Massachusetts data were provided by the Metropolitan Area Planning Council. LEHD data are developed by synthesizing state unemployment insurance earnings data and the Quarterly Census of Employment and Wages data with additional administration data from the census. Because employment data originate from individual states, some inconsistencies arise in regards to how employment locations are assessed. For instance, employment in some school districts is allocated to the school district headquarters instead of the individual school locations, which contributes to data quality problems that affect a number of SLD variables. In general, some individual block group employment estimates may be inaccurate. The broad patterns of employment depicted in these data, however, appear consistent with known conditions. More information about census LEHD data and its limitations is available at <http://lehd.did.census.gov/data/>.

Area Database of the United States (USGS GAP, 2012) and NAVTEQ<sup>3</sup> to identify land areas that are parklands, privately owned conservation easements, and other public lands that are protected from private development activity. We used geographic information systems to overlay these areas with block group polygons to isolate the unprotected areas of each block group. We then determined the unprotected land area of each block group and used this value to calculate each activity density variable. The result, we believe, is an improved estimation of actual density of activity.

## Diversity

Land use diversity refers to the relative mix of different land uses. For this national study we used housing counts and employment counts broken down by job sector as proxies for different land uses. Although this approach enabled us to calculate a variety of different entropy metrics (see the appendix), it had a few notable limitations. First, counts summarized at the block group scale provide no information about how different activities are spatially distributed within each block group. For instance, a very large block group in an area of low-density development may include a variety of different activities. Those activities, however, may be spatially separated within the block group area. As a result, any given part of the block group might have very little diversity when examined in detail, even though the diversity value for the block group as a whole is quite high.

Another problem emerges in higher density urban areas, where block groups may be quite small. In this case, it is possible for a block group dominated by office jobs or residential uses to have a very low value for land use diversity even though a variety of different and complementary land uses exist directly across the street in a neighboring block group. Our methods of calculation did not consider activities outside the boundaries of any given block group. A more sophisticated spatial analysis approach could be used to partially address this latter limitation. For instance, it could be possible to estimate the mix of land uses in all block groups that intersect a 0.25-mile radius of each block group centroid.

Despite these limitations, a few diversity metrics calculated for the SLD have proven to be correlated with outcomes of interest such as workplace-based walk trips and vehicle travel. Therefore, we are optimistic they will prove to be at least somewhat useful in their current form.

## Design

Our urban design variables all measure some aspect of street connectivity based on a detailed analysis of street network data from NAVTEQ. Highly connected street networks enable travelers to reach nearby destinations more efficiently. Although design metrics are most commonly used to assess the pedestrian environment, we were challenged by the lack of data about the presence or quality of sidewalks. Our solution involved analyzing the roadway link attribute information. Using attributes such as speed class, direction of travel (one- or two-way), and auto or pedestrian restrictions enabled us to classify each roadway link as auto-oriented, multimodal, or pedestrian-oriented.

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<sup>3</sup> NAVTEQ is a geographic data provider that undertakes independent data collection rather than relying on government maps and data sources. It is the primary data source for many portable global positioning system devices and navigation systems. The parks and street network data used in this analysis were released in 2011.

This classification enabled us to develop a variety of metrics that, collectively, summarize the relative connectivity of the street network from the perspectives of both automobile and pedestrian travel.

## **Transit Service**

One of the most challenging aspects of this study was collecting uniform information about transit service for communities across the country. The data gathered to calculate these variables fall into two categories. First, we obtained the locations of all fixed-guideway transit stations from the Center for Transit Oriented Development (CTOD, 2011), including all rail lines, streetcars, ferries, trolleys, and some bus rapid-transit systems. Second, we obtained transit-service data (stop locations, routes, and schedules) for 228 local and regional transit agencies<sup>4</sup> across the nation, which was possible only because these agencies all publicly shared their data in the common general transit feed specification (GTFS)<sup>5</sup> format. In general, most large transit agencies in transit-rich regions share their data in GTFS format, but many smaller transit agencies do not; therefore, transit-service data from these agencies are missing from the SLD.<sup>6</sup> Ramsey and Bell (2013) provided a full listing of agencies included in the analysis, organized by metropolitan region served.

## **Destination Accessibility**

Destination accessibility refers to the ease of reaching activities (jobs or workforce) from a given location. We calculated auto accessibility values for all block groups in the United States and transit accessibility values for areas served by transit agencies that share GTFS data.

The accessibility concept requires an understanding of travel times between block group locations. Destinations within a given travel budget are considered “accessible” from the origin, and activities at each accessible destination are discounted according to the time it takes to reach them. We used the NAVTEQ streets data (NAVSTREETS) to assess drive times from each block group centroid in the country to all potential block group destination centroids via street network, capping the search for destinations at 45 minutes.<sup>7</sup> Speed of travel was determined by NAVTEQ’s “Speed Category” field. Therefore, drive times estimate freeflow speeds on each roadway, with no attention to congestion effects. Although this analysis was a data-intensive undertaking, it was relatively straightforward in application.

The transit accessibility analysis was carried out in a similar fashion to the auto analysis, using the NAVSTREETS network to model walk times and GTFS schedules to assess the in-vehicle portions of transit trips to find the shortest travel times between block group origin-destination (OD) pairs.

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<sup>4</sup> A full listing of transit agencies with data reflected in the SLD is available in Ramsey and Bell (2013), appendix A, at [https://edg.epa.gov/data/Public/OP/SLD/SLD\\_UserGuide.pdf](https://edg.epa.gov/data/Public/OP/SLD/SLD_UserGuide.pdf).

<sup>5</sup> More information about GTFS is available at <https://developers.google.com/transit/gtfs/>. Agencies can post raw GTFS files for public download on the GTFS data exchange (<http://www.gtfs-data-exchange.com/>). A full listing of agencies that do and do not share their data in GTFS format is available at City-Go-Round (<http://www.citygoround.org/agencies/>).

<sup>6</sup> An analysis of data from the National Transit Database showed that transit agencies with GTFS data reflected in the SLD account for 88 percent of all transit ridership in the United States. See Ramsey and Bell (2013) for details.

<sup>7</sup> Block group-weighted centroids—point locations that approximate the center of population within a block group—were obtained from the U.S. census.

Transit analyses are inherently more complex, however, because of the interplay of the transit and pedestrian networks, and we faced more numerous and more daunting challenges in running this analysis.

To evaluate transit accessibility, we (1) estimated walk access and egress times between a block group centroid and accessible transit stops, (2) imposed a standard wait time to board a transit vehicle, (3) enforced limitations on how far a traveler would walk and how long he or she might wait to make a transfer, and (4) assessed the competitiveness of walking from one block group to another as an alternative to taking transit for very short trips. Although these topics would merit more detailed attention in a regional study, we accepted some general rules for our nationwide analysis, imposing a constant 5-minute wait time to board the first transit vehicle, allowing for up to 10 minutes to wait for a transfer (5 of which may be used to walk to the transfer opportunity), and limiting the analysis of travel itineraries to a maximum of one transfer. We also faced two major challenges in assessing travel times between block groups for the entire country.

First, we needed to consolidate all GTFS files into a single table of stop locations and stop events (a stop event is a scheduled boarding or alighting opportunity associated with a particular stop location and a specific transit vehicle trip). To keep this table manageable in size and scope, we combined information only on routes and stops that operate on weekdays during the evening peak period (defined as 5 to 7 p.m.). This approach enabled us to analyze interactions among transit properties that produce separate datasets, even though they have overlapping service areas. Although such an exercise is straightforward for one or two GTFS datasets, working with several hundred is more challenging. We created scripts to pull the relevant data out of each GTFS directory and assemble them in a consolidated table with unique identifiers for stops, trips, agencies, and so on. We encountered issues, however, that required manual intervention throughout, the most common of which were related to how various agencies specified calendar dates in the GTFS tables.<sup>8</sup>

After assembling a single nationwide transit schedule, we set out to determine the shortest travel time between transit stop locations, allowing for 45 minutes of in-vehicle travel time. Whereas most GTFS analyses are built with a definite start time of the trip in mind, we needed to analyze all potential itineraries in the evening peak period to identify the transit trip (or combination of two trips) that provided the shortest travel time between two stop events. This approach often resulted in numerous redundant itineraries for a single stop-event pair, generating very large datasets. We ultimately analyzed about 12.5 trillion itineraries between stop events (about 620 gigabytes of data). We pared these data down by relating each stop event to its location and finding the shortest travel time between stop locations. Finally, we cross-referenced the stop locations OD matrix with walk access and egress times to obtain the shortest transit travel times between block group pairs.

The transit accessibility analysis was conducted for the evening peak period. Several examples of places, however, are served only by morning peak-period service toward downtown and evening peak-period service away from downtown. To emulate the morning peak travel period using only

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<sup>8</sup> In some instances, agencies have a service code for all regular weekday service. In other cases, service codes specify each day of the week, and, in other cases, service codes are specified by date, such that each calendar date is addressed differently. For the latter cases, we took services on Wednesdays (whether coded by day of week or by calendar date) to be “typical weekdays.”

the evening peak-period data and analysis, we assumed that if a traveler could go from downtown to a suburban residential area in the evening peak, they could also go from the residential area to downtown in the morning peak. Therefore, we also analyzed travel times from destination block group to origin block group to ensure that our overall estimates of transit accessibility were not biased by the expected directionality of service in the evening peak.

## **Accessing the Smart Location Database**

The SLD is a free resource available to the public via download, web service, or interactive map viewer. Data for the entire nation can be downloaded in tabular (.dbf), shapefile, or Esri geodatabase formats. Users who want to download data for only a single state, metropolitan region, or locality can do so by using EPA's Clip N Ship tool. Information about all access options is available on the SLD website: <http://epa.gov/smartgrowth/smartlocationdatabase.htm>.

## **Data Currency and Suitability**

The SLD reflects housing, population, and employment conditions in 2010, street network conditions in 2011, and transit-service conditions in late 2012. It provides a consistent and generally reliable snapshot of built environment and accessibility characteristics for neighborhoods across the United States. The SLD is not suitable for studies that require knowing the very latest conditions in a given neighborhood, particularly in regions that are experiencing rapid changes because of new construction, migration, or transit-service alterations. EPA hopes to update this database regularly—at least every decennial census. Such plans are contingent on the continued availability of funding, however. Methodologies for all variable calculations are published on line to enable others to develop their own updates.

## **Example Application: Federal Facility Siting**

The White House Executive Order, “Federal Leadership in Environmental, Energy, and Economic Performance,”<sup>9</sup> called on federal agencies to consider the sustainability of locations in facility site-selection decisions. To implement this order, the U.S. General Services Administration is drawing on the SLD to develop several new key performance indicators for comparing the sustainability characteristics of existing and proposed facility locations, primarily in terms of workers’ commute travel. These indicators measure worksite neighborhood characteristics at the block group scale and can be accessed through an interactive mapping tool available to facility managers. Some indicators are pulled directly from the SLD, and others are modeled based on the results of a nationwide study to measure the effect of workplace neighborhood characteristics (as measured by the SLD) on workers’ travel behavior.

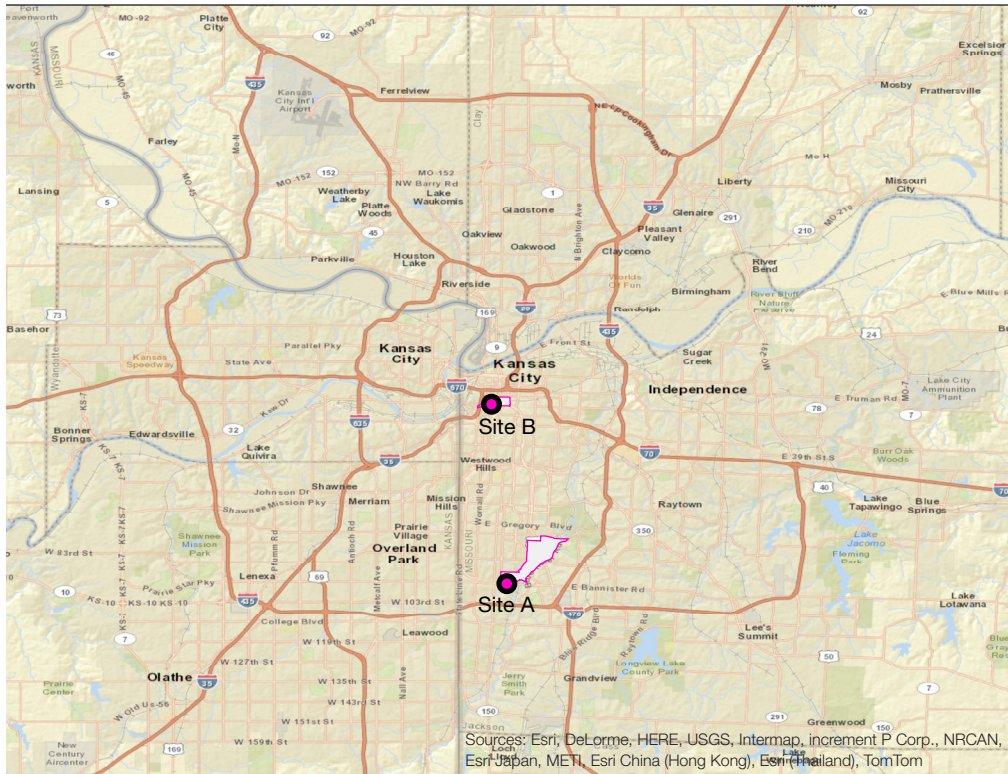
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<sup>9</sup> Executive Order Number 13514 (2009), “Federal Leadership in Environmental, Energy, and Economic Performance.” See [http://www.whitehouse.gov/assets/documents/2009fedleader\\_co\\_rel.pdf](http://www.whitehouse.gov/assets/documents/2009fedleader_co_rel.pdf).

GSA recently used these performance indicators to estimate the environmental benefits of its recent decision to move an existing facility 12 miles south of Kansas City, Missouri, to a new facility near the downtown core of the city. Exhibit 1 shows the location of the two facility sites.

### Exhibit 1

#### Kansas City, Missouri Facility Locations Analyzed for Performance Comparison



Sources: Esri; U.S. Census Bureau; U.S. Geological Survey

This comparison of facility performance (exhibit 2) revealed that Site B (the new facility near downtown Kansas City) performs better than both Site A and the regional average with regard to all indicators. In particular, noncommute vehicle miles traveled (VMT), comprising day trips such as lunch and errands, are estimated to be less than one-half of those of the suburban facility, in large part because of the greater density and diversity of employment in the surrounding neighborhood (indicators that more destinations are within walking distance). Overall, Site B is estimated to generate 22 percent less VMT and associated greenhouse gas emissions per worker than Site A generates.



## Exhibit 2

### Location Efficiency Comparison of Kansas City, Missouri Facility Sites and Regional Benchmarks

Performance Indicator	Site A	Site B	Regional Benchmarks		
			Average	Highest Performing	Lowest Performing
<b>Transportation (daily per worker)</b>					
Total VMT	26.46	20.69	24.36	17.85	34.81
Commute VMT	20.20	18.06	19.27	16.26	25.41
Noncommute VMT	6.26	2.62	5.09	1.59	9.39
Transportation-related greenhouse gas emissions per worker (lbs) compared with regional average	+ 512	- 888	0	- 1,575	+ 2,535
<b>Monetized impact or benefits to workforce (annual per worker) compared with regional average</b>					
Mobility cost (\$)	+ 191	- 332	0	- 589	+ 949
Fuel cost (\$)	+ 85	- 147	0	- 261	+ 419
Highway safety cost (\$)	+ 99	- 172	0	- 306	+ 493
Efficiency and reliability cost (\$)	+ 18	- 32	0	- 56	+ 91
<b>Neighborhood characteristics</b>					
Proximity to nearest transit stop (miles)	0.39	0.19	NA	0.13	No transit within 0.75 mile
Employment within 0.50 mile of fixed-guideway transit station (%)	0	83	11	100	0
Accessibility by workforce via transit (% of regional maximum)	10	37	10	32	0

lbs = pounds. NA = not available. VMT = vehicle miles traveled.

## Appendix

### Variables Included in the Smart Location Database (1 of 9)

Field	Description	Data Source(s)	Coverage
<b>Administrative</b>			
GEOID10	CBG 12-digit FIPS code.	2010 census TIGER/Line	Entire United States
TRACTCE10	Census tract FIPS code in which CBG resides.	2010 census TIGER/Line	Entire United States
CFIPS	County FIPS code.	2010 census TIGER/Line	Entire United States
SFIPS	State FIPS code.	2010 census TIGER/Line	Entire United States
CSA	CSA code.	2010 census	Entire United States
CSA_Name	Name of CSA in which CBG resides.	2010 census	Entire United States
CBSA	FIPS code for CBSA in which CBG resides.	2010 census	Entire United States
CBSA_Name	Name of CBSA in which CBG resides.	2010 census	Entire United States



## Appendix

### Variables Included in the Smart Location Database (2 of 9)

Field	Description	Data Source(s)	Coverage
<b>CBSA-wide statistics (same value for all block groups within the same CBSA [metropolitan area])</b>			
CBSA_Pop	Total population in CBSA.	2010 census	Entire United States
CBSA_Emp	Total employment in CBSA.	Census LEHD, 2010	Entire United States (except PR)
CBSA_Wrk	Total number of workers that live in CBSA.	Census LEHD, 2010	Entire United States (except PR)
<b>Area</b>			
Ac_Tot	Total geometric area of the CBG.	2010 census TIGER/Line	Entire United States
Ac_Unpr	Total land area in acres that is not protected from development (that is, not a park or conservation area).	2010 census; NAVTEQ parks; PAD-US	Entire United States
Ac_Water	Total water area in acres.	2010 census; NAVTEQ water and oceans	Entire United States
Ac_Land	Total land area in acres.	2010 census; NAVTEQ water and oceans	Entire United States
<b>Demographics</b>			
CountHU	Housing units, 2010.	2010 census	Entire United States
HH	Households (occupied housing units), 2010.	2010 census	Entire United States
TotPop	Population, 2010.	2010 census	Entire United States
P_WrkAge	Percentage of population that is working age, 2010.	2010 census	Entire United States
AutoOwn0	Number of households in CBG that own zero automobiles, 2010.	ACS; 2010 census	Entire United States
Pct_AO0	Percentage of zero-car households in CBG.	ACS	Entire United States
AutoOwn1	Number of households in CBG that own one automobile, 2010.	ACS; 2010 census	Entire United States
Pct_AO1	Percentage of one-car households in CBG.	ACS	Entire United States
AutoOwn2p	Number of households in CBG that own two or more automobiles, 2010.	ACS; 2010 census	Entire United States
Pct_AO2p	Percentage of two-plus-car households in CBG.	ACS	Entire United States
Workers	Number of workers in CBG (home location), 2010.	Census LEHD, 2010	Entire United States (except PR)
R_LowWageWk	Number of workers earning \$1,250 per month or less (home location), 2010.	Census LEHD, 2010	Entire United States (except PR)

## Appendix

### Variables Included in the Smart Location Database (3 of 9)

Field	Description	Data Source(s)	Coverage
R_MedWageWk	Number of workers earning more than \$1,250 per month but less than \$3,333 per month (home location), 2010.	Census LEHD, 2010	Entire United States (except PR)
R_HiWageWk	Number of workers earning \$3,333 per month or more (home location), 2010.	Census LEHD, 2010	Entire United States (except PR)
R_PctLowWage	Percentage of R_LowWageWk of Workers in a CBG (home location), 2010.	Census LEHD, 2010	Entire United States (except PR)

### Employment

TotEmp	Total employment, 2010.	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E5_Ret10	Retail jobs within a five-tier employment classification scheme (LEHD: CNS07).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E5_Off10	Office jobs within a five-tier employment classification scheme (LEHD: CNS09 + CNS10 + CNS11 + CNS13 + CNS20).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E5_Ind10	Industrial jobs within a five-tier employment classification scheme (LEHD: CNS01 + CNS02 + CNS03 + CNS04 + CNS05 + CNS06 + CNS08).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E5_Svc10	Service jobs within a five-tier employment classification scheme (LEHD: CNS12 + CNS14 + CNS15 + CNS16 + CNS19).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E5_Ent10	Entertainment jobs within a five-tier employment classification scheme (LEHD: CNS17 + CNS18).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E8_Ret10	Retail jobs within an eight-tier employment classification scheme (LEHD: CNS07).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E8_Off10	Office jobs within an eight-tier employment classification scheme (LEHD: CNS09 + CNS10 + CNS11 + CNS13).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E8_Ind10	Industrial jobs within an eight-tier employment classification scheme (LEHD: CNS01 + CNS02 + CNS03 + CNS04 + CNS05 + CNS06 + CNS08).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)

## Appendix

### Variables Included in the Smart Location Database (4 of 9)

Field	Description	Data Source(s)	Coverage
E8_Svc10	Service jobs within an eight-tier employment classification scheme (LEHD: CNS12 + CNS14 + CNS19).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E8_Ent10	Entertainment jobs within an eight-tier employment classification scheme (LEHD: CNS17 + CNS18).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E8_Ed10	Education jobs within an eight-tier employment classification scheme (LEHD: CNS15).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E8_Hlth10	Healthcare jobs within an eight-tier employment classification scheme (LEHD: CNS16).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E8_Pub10	Public administration jobs within an eight-tier employment classification scheme (LEHD: CNS20).	Census LEHD, 2010; InfoUSA, 2011 (MA only)	Entire United States (except PR)
E_LowWageWk	Number of workers earning \$1,250 per month or less (work location), 2010.	Census LEHD, 2010	Entire United States (except MA and PR)
E_MedWageWk	Number of workers earning more than \$1,250 per month but less than \$3,333 per month (work location), 2010.	Census LEHD, 2010	Entire United States (except MA and PR)
E_HiWageWk	Number of workers earning \$3,333 per month or more (work location), 2010.	Census LEHD, 2010	Entire United States (except MA and PR)
E_PctLowWage	Percentage of LowWageWk of Workers in a CBG (work location), 2010.	Census LEHD, 2010	Entire United States (except MA and PR)
<b>D1—Density</b>			
D1a	Gross residential density (HU/acre) on unprotected land.	Derived from other SLD variables	Entire United States
D1b	Gross population density (people/acre) on unprotected land.	Derived from other SLD variables	Entire United States
D1c	Gross employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c5_Ret10	Gross retail (five-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c5_Off10	Gross office (five -tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)

## Appendix

### Variables Included in the Smart Location Database (5 of 9)

Field	Description	Data Source(s)	Coverage
D1c5_Ind10	Gross industrial (five -tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c5_Svc10	Gross service (five-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c5_Ent10	Gross entertainment (five-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c8_Ret10	Gross retail (eight-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c8_Off10	Gross office (eight-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c8_Ind10	Gross industrial (eight-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c8_Svc10	Gross service (eight-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c8_Ent10	Gross entertainment (eight-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c8_Ed10	Gross education (eight-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c8_Hlth10	Gross healthcare (eight-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1c8_Pub10	Gross retail (eight-tier) employment density (jobs/acre) on unprotected land.	Derived from other SLD variables	Entire United States (except PR)
D1d	Gross activity density (employment + HUs) on unprotected land.	Derived from other SLD variables	Entire United States (PR does not reflect employment)
D1_Flag	Flag indicating that density metrics are based on total CBG land acreage rather than unprotected acreage.	Derived from other SLD variables	Entire United States (PR does not reflect employment)

## Appendix

### Variables Included in the Smart Location Database (6 of 9)

Field	Description	Data Source(s)	Coverage
<b>D2—Diversity</b>			
D2a_JpHH	Jobs per household.	Derived from other SLD variables	Entire United States (except PR)
D2b_E5Mix	Five-tier employment entropy (denominator set to observed employment types in the CBG).	Derived from other SLD variables	Entire United States (except PR)
D2b_E5MixA	Five-tier employment entropy (denominator set to the static five employment types in the CBG).	Derived from other SLD variables	Entire United States (except PR)
D2b_E8Mix	Eight-tier employment entropy (denominator set to observed employment types in the CBG).	Derived from other SLD variables	Entire United States (except PR)
D2b_E8MixA	Eight-tier employment entropy (denominator set to the static eight employment types in the CBG).	Derived from other SLD variables	Entire United States (except PR)
D2a_EpHHm	Employment and household entropy.	Derived from other SLD variables	Entire United States (except PR)
D2c_TrpMx1	Employment and household entropy (based on vehicle trip production and trip attractions including all five employment categories).	Derived from other SLD variables	Entire United States (except PR)
D2c_TrpMx2	Employment and household entropy calculations, based on trips production and trip attractions including four of the five employment categories (excluding industrial).	Derived from other SLD variables	Entire United States (except PR)
D2c_TripEq	Trip productions and trip attractions equilibrium index; the closer to 1, the more balanced the trip making.	Derived from other SLD variables	Entire United States (except PR)
D2r_JobPop	Regional diversity. Standard calculation based on population and total employment: deviation of CBG ratio of jobs/population from regional average ratio of jobs/population.	Derived from other SLD variables	Entire United States (except PR)
D2r_WrkEmp	Household workers per job, as compared with the region: deviation of CBG ratio of household workers/job from regional average ratio of household workers/job.	Derived from other SLD variables	Entire United States (except PR)
D2a_WrkEmp	Household workers per job, by CBG.	Derived from other SLD variables	Entire United States (except PR)
D2c_WrEmIx	Household workers per job equilibrium index; the closer to one the more balanced the resident workers and jobs in the CBG.	Derived from other SLD variables	Entire United States (except PR)

## Appendix

### Variables Included in the Smart Location Database (7 of 9)

Field	Description	Data Source(s)	Coverage
<b>D3—Design</b>			
D3a	Total road network density.	NAVSTREETS	Entire United States
D3aao	Network density in terms of facility miles of auto-oriented links per square mile.	NAVSTREETS	Entire United States
D3amm	Network density in terms of facility miles of multimodal links per square mile.	NAVSTREETS	Entire United States
D3apo	Network density in terms of facility miles of pedestrian-oriented links per square mile.	NAVSTREETS	Entire United States
D3b	Street intersection density (weighted, auto-oriented intersections eliminated).	NAVSTREETS	Entire United States
D3bao	Intersection density in terms of auto-oriented intersections per square mile.	NAVSTREETS	Entire United States
D3bmm3	Intersection density in terms of multimodal intersections having three legs per square mile.	NAVSTREETS	Entire United States
D3bmm4	Intersection density in terms of multimodal intersections having four or more legs per square mile.	NAVSTREETS	Entire United States
D3bpo3	Intersection density in terms of pedestrian-oriented intersections having three legs per square mile.	NAVSTREETS	Entire United States
D3bpo4	Intersection density in terms of pedestrian-oriented intersections having four or more legs per square mile.	NAVSTREETS	Entire United States
<b>D4—Transit</b>			
D4a	Distance from population weighted centroid to nearest transit stop (meters).	GTFS; TOD Database 2012	Participating GTFS transit-service areas/ TOD database locations
D4b025	Proportion of CBG employment within 0.25 mile of fixed-guideway transit stop.	TOD Database 2012; SLD unprotected area polygons	Entire United States
D4b050	Proportion of CBG employment within 0.5 mile of fixed-guideway transit stop.	TOD Database 2012; SLD unprotected area polygons	Entire United States

## Appendix

### Variables Included in the Smart Location Database (8 of 9)

Field	Description	Data Source(s)	Coverage
D4c	Aggregate frequency of transit service within 0.25 mile of block group boundary per hour during evening peak period.	GTFS	Participating GTFS transit-service areas
D4d	Aggregate frequency of transit service (D4c) per square mile.	Derived from other SLD variables	Participating GTFS transit-service areas
<b>D5—Destination accessibility</b>			
D5ar	Jobs within 45 minutes auto travel time, time decay (network travel time) weighted.	NAVSTREETS	Entire United States (except PR)
D5ae	Working-age population within 45 minutes auto travel time, time decay (network travel time) weighted.	NAVSTREETS	Entire United States
D5br	Jobs within 45-minute transit commute, distance decay (walk network travel time, GTFS schedules) weighted.	NAVSTREETS; GTFS	Participating GTFS transit-service areas (except PR)
D5be	Working-age population within 45-minute transit commute, time decay (walk network travel time, GTFS schedules) weighted.	NAVSTREETS; GTFS	Participating GTFS transit-service areas
D5cr	Proportional accessibility to regional destinations—auto: employment accessibility expressed as a ratio of total MSA accessibility.	Derived from other SLD variables	Entire United States (except PR)
D5cri	Regional centrality index—auto: CBG D5cr score relative to maximum CBSA D5cr score.	Derived from other SLD variables	Entire United States
D5ce	Proportional accessibility to regional destinations—auto: working-age population accessibility expressed as a ratio of total CBSA accessibility.	Derived from other SLD variables	Entire United States
D5cei	Regional centrality index—auto: CBG D5ce score relative to max CBSA D5ce score.	Derived from other SLD variables	Entire United States
D5dr	Proportional accessibility of regional destinations—transit: employment accessibility expressed as a ratio of total MSA accessibility.	Derived from other SLD variables	Participating GTFS transit-service areas
D5dri	Regional centrality index—transit: CBG D5dr score relative to maximum CBSA D5dr score.	Derived from other SLD variables	Participating GTFS transit-service areas



## Appendix

### Variables Included in the Smart Location Database (9 of 9)

Field	Description	Data Source(s)	Coverage
D5de	Proportional accessibility of regional destinations—transit: working-age population accessibility expressed as a ratio of total MSA accessibility.	Derived from other SLD variables	Participating GTFS transit-service areas
D5dei	Regional centrality index—transit: CBG D5de score relative to maximum CBSA D5de score.	Derived from other SLD variables	Participating GTFS transit-service areas

ACS = 2010 American Community Survey 5-Year estimates. CBG = census block group. CBSA = core based statistical area. CSA = combined statistical area. FIPS = Federal Information Processing Standard. GTFS = general transit feed specification. HU = housing units. LEHD = Longitudinal Employer-Household Dynamics. MA = Massachusetts. MSA = metropolitan statistical area. PAD-US = Protected Areas Database of the United States. PR = Puerto Rico. SLD = Smart Location Database. TOD = transit-oriented development.

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Kevin Ramsey is a senior associate at BERK Consulting. He managed the development of the Smart Location Database while participating in a fellowship at the Environmental Protection Agency.

Alexander Bell is a senior planner at Renaissance Planning Group. He conducted much of the data analysis required to develop the Smart Location Database.

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## Graphic Detail

Geographic Information Systems (GIS) organize and clarify the patterns of human activities on the Earth's surface and their interaction with each other. GIS data, in the form of maps, can quickly and powerfully convey relationships to policymakers and the public. This department of Cityscape includes maps that convey important housing or community development policy issues or solutions. If you have made such a map and are willing to share it in a future issue of Cityscape, please contact [rwilson@umbc.edu](mailto:rwilson@umbc.edu).

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# Comparative Micromaps and Changing State Homeownership Rates

**Brent D. Mast**

U.S. Department of Housing and Urban Development

*The views expressed in this article are those of the author and do not represent the official positions or policies of the Office of Policy Development and Research, the U.S. Department of Housing and Urban Development, or the U.S. government.*

Micromaps display multiple maps on the same exhibit, with different geographic units highlighted in each map. A comparative micromap (hereafter, referred to as a CM; for examples, see Carr and Pickle, 2010) is a type of micromap with a series of indexed maps designed to convey change in a statistic; the index is typically time.

In this article, I demonstrate how to use CMs to visualize changing homeownership rates in the 50 states and Washington, D.C. The homeownership rate equals owner-occupied housing units as a percentage of total occupied housing units. I analyze American Community Survey homeownership data for 3 years: 2006, 2009, and 2012. My dataset consists of 153 observations, where an observation is the homeownership rate in a state in a given year (hereafter, referred to as a state-year).

State homeownership rate estimates varied from 41.5 percent for Washington, D.C., in 2012 to 76.3 percent for Minnesota in 2006, with a median of 68.1 percent for Virginia in 2009 and a mean of 67.1 percent. In 2006, the median rate was 69.7 percent for New Mexico and the mean rate was 68.4 percent. In 2009, the median rate was 68.1 percent for Virginia and the mean rate was 67.3 percent. In 2012, the median rate was 66.5 percent for Maryland and the mean rate was 65.5 percent.

Exhibit 1 displays a CM<sup>1</sup> mapping homeownership rates for 2006, 2009, and 2012. States in exhibit 1 are shaded according to the three homeownership rate categories indicated by the bottom horizontal slider. Cut points for the homeownership rate categories in exhibit 1 are roughly the 33rd and 66th percentiles. Cut points are reported below the slider, and the percentages of state-years in the categories are reported above the slider. I will refer to the lowest homeownership rate category as “low,” the middle category as “medium,” and the highest category as “high.” In exhibit 1, the 51 state-years in the low category with homeownership rates less than or equal to 66.5 percent are shaded light gray; the 53 state-years with medium rates greater than 66.5 percent and less than or equal to 69.6 percent are shaded medium gray; and the 49 state-years with high rates greater than 69.6 percent are shaded black.

Exhibit 1 displays micromaps in three rows. The three maps in the middle row of exhibit 1 correspond to years 2006, 2009, and 2012 from left to right, respectively. Homeownership rates fell dramatically between 2006 and 2009 and between 2009 and 2012. In 2006, 11 states were in the

**Exhibit 1**

**State Homeownership Rates: 2006, 2009, and 2012**



Notes: The three maps in the middle row correspond to, from left to right, years 2006, 2009, and 2012. The two maps in the top and bottom rows correspond to changes in homeownership categories, from left to right, between 2006 and 2009 and between 2009 and 2012. In the top and bottom rows, states that experienced changes in categories are shaded according to their new category.

Sources: 2006, 2009, and 2012 American Community Survey 1-year data

<sup>1</sup> The CMs in the article were produced with R programs (available upon request) based on Carr’s (2014) programs.

low category, 14 were in the medium category, and 26 were in the high category. In 2009, 14 states were in the low category, 23 were in the medium category, and 14 were in the high category. In 2012, 26 states were in the low category, 16 were in the medium category, and 9 were in the high category.

The two maps in the top and bottom rows of exhibit 1 correspond to changes in homeownership categories. The top row highlights states that experienced increases in homeownership categories, and the bottom row highlights states that experienced decreases. Wyoming is the only state that experienced an increase in homeownership rate categories during the 3-year period; between 2006 and 2009, its category increased from medium to high. In the middle row of exhibit 1, Wyoming is shaded medium gray in 2006 and black in 2009. In the top left micromap of exhibit 1, Wyoming is shaded black to indicate that its category increased to high in 2009.

In the bottom left micromap of exhibit 1, the 16 states that experienced a decrease in categories between 2006 and 2009 are highlighted; 13 are shaded medium gray to indicate that their category decreased to medium in 2009, and three are shaded light gray to indicate that their category decreased to low.

In the bottom right micromap of exhibit 1, the 17 states that experienced a decrease in categories between 2009 and 2012 are highlighted; 5 are shaded medium gray to indicate that their category decreased to medium in 2012, and 12 are shaded light gray to indicate that their category decreased to low.

Differences between the 2009 and 2006 homeownership rates varied from -2.9 percentage points in Hawaii to 1.4 percentage points in Wyoming, with a median of -1.2 percentage points in Pennsylvania and a mean of -1.1 percentage points. Differences between the 2012 and 2009 rates varied from -4.5 percentage points in Arizona to 0.2 percentage points in Hawaii, with a median of -1.8 percentage points in Ohio and a mean of -1.8 percentage points.

Exhibit 2 displays a CM mapping percentage-point differences in homeownership rates between 2009 and 2006 and between 2012 and 2009. States in exhibit 2 are shaded according to the three categories of percentage-point differences in homeownership rates indicated by the bottom horizontal slider. Cut points for the percentage-point difference categories in exhibit 2 are roughly the 33rd and 66th percentiles. Cut points are reported below the slider, and the percentages of state-years in the categories are reported above the slider. I will refer to the lowest percentage-point difference category as “low,” the middle category as “medium,” and the highest category as “high.” In exhibit 2, the 30 state-years in the low category with differences less than or equal to -1.9 percentage points are shaded light gray; the 37 state-years in the medium category with differences greater than -1.9 percentage points and less than or equal to -1.1 percentage points are shaded medium gray; and the 35 state-years in the high category with differences greater than -1.1 percentage points are shaded black.

Like exhibit 1, exhibit 2 displays micromaps in three rows. The two maps in the middle row of exhibit 2 correspond to 2006-to-2009 and 2009-to-2012 differences, respectively. Between 2009 and 2006, 9 state differences were in the low category, 18 were in the medium category, and 24 were in the high category. Between 2012 and 2009, 21 state differences were in the low category, 19 were in the medium category, and 11 were in the high category.

**Exhibit 2**

**Changes in State Homeownership Rates: 2006 to 2009 and 2009 to 2012**



Note: In the top and bottom rows, states that experienced changes in difference categories are shaded according to their new category.

Sources: 2006, 2009, and 2012 American Community Survey 1-year data

The maps in the top and bottom rows of exhibit 2 correspond to changes in categories of percentage-point differences in homeownership rates. The top map highlights the 11 states that experienced increases in categories; 3 are shaded medium gray to indicate that their category increased to medium, and 8 are shaded black to indicate that their category increased to high. The bottom map highlights the 27 states that experienced decreases; 9 are shaded medium gray to indicate that their category decreased to medium, and 18 are shaded light gray to indicate that their category decreased to low.

The CM is a useful tool for visualizing changes in geographic data. In this article, CMs clearly demonstrate a downward trend in state homeownership rates since 2006.

## **Acknowledgments**

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# Artists and Bankers and Hipsters, Oh My! Mapping Tweets in the New York Metropolitan Region

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The maps in exhibits 1 and 2 are based on all geotagged tweets sent in the New York metropolitan area (as defined by the extent of the maps) between June 2012 and March 2014. By looking at specific variables within Twitter data (that is, the content of tweets and self-descriptions of Twitter users), we are able to visualize the spatial distribution of selected cultural-economic indicators and self-defined identities as manifest in this particular dimension of social media. The first map (exhibit 1) is based on tweets with messages containing the words “hipster” (12,319 tweets referencing a subculture associated with progressive politics, indie rock bands, and pretension) or “bro” (239,412 tweets referencing a phrase strongly associated with a college-age partying demographic).<sup>1</sup> The second map (exhibit 2) compares the location of tweets sent by users who self-identified as “bankers” (19,037 tweets) or “artists” (759,027 tweets). Tweet text and user profiles are free form and individuals are free to choose what information to share. The data are drawn from the DOLLY (Digital OnLine Life and You) project at the University of Kentucky that archives an array of geocoded social media, including tweets.

Although these keywords were selected based on their paired dissimilarities, there are overlapping and alternative uses as well, as is the case with any cultural marker. Moreover, this analysis does not place the use of these words or identities into linguistic context (for example, are tweets about hipsters disparaging or positive?). Although such coding is possible (via computer algorithms or hand labeling),<sup>2</sup> the goal of these maps is primarily to highlight differences in the spatial distribution of these indicators rather than take on the much more complicated task of categorizing the more nuanced differences in the spatiality of these markers.

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<sup>1</sup> The definitions provided by the crowd-sourced Urban Dictionary provide a good overview of how these two terms are perceived within popular, online culture. See <http://www.urbandictionary.com/define.php?term=bro> and <http://www.urbandictionary.com/define.php?term=hipster>.

<sup>2</sup> See <http://www.floatingsheep.org/2013/05/hatemap.html>.

**Exhibit 1**

**Map of “Bro” and “Hipster” Tweets**



DUMBO = Down Under the Manhattan Bridge Overpass. NOHO = North of Houston. SOHO = South of Houston.

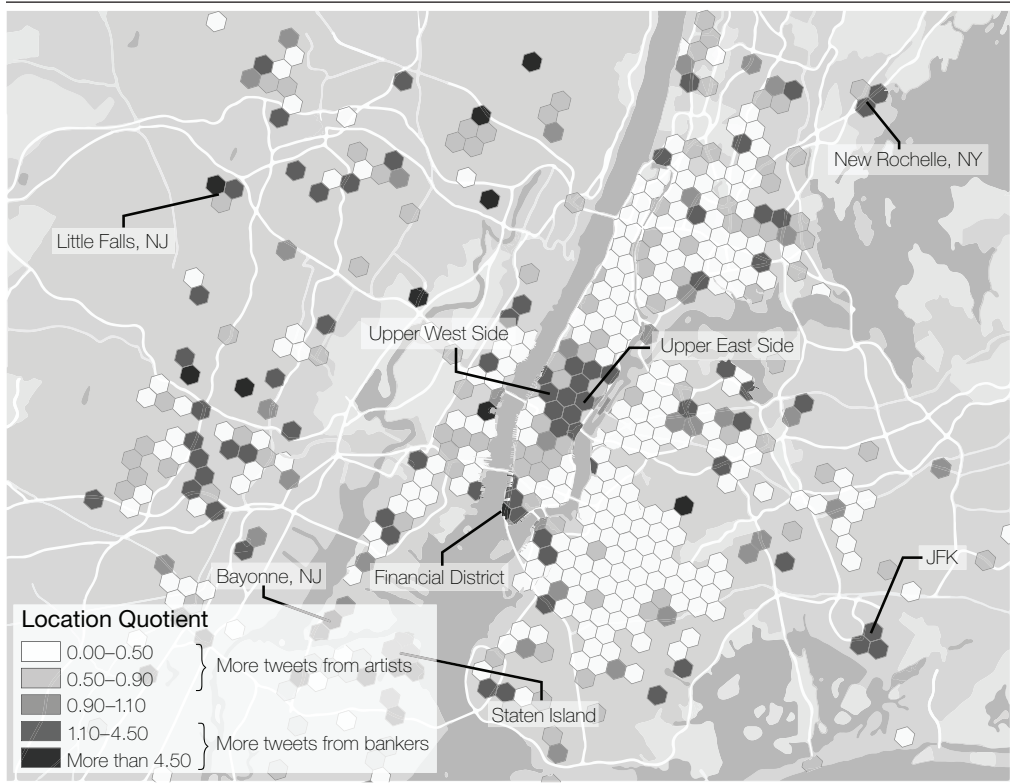
Aggregating tweets to 1,000-meter-wide hexagonal cells containing sufficiently large samples to be normalized by location quotients (LQs),<sup>3</sup> the resulting maps (with hexagons clipped at the waterlines for better legibility) visualize the spatial distribution of (1) “hipster” and “bro” subcultures and (2) self-identified “bankers” and “artists” as manifested within Twitter. The hipster/bro map in exhibit 1 shows concentrations of hipster references (the darkest hexagons with LQ > 1) within Brooklyn (particularly DUMBO, Prospect Park, and Williamsburg) and Manhattan (around SOHO/NOHO and Columbia University), with smaller clusters scattered elsewhere. This pattern corresponds well with commonly known “hipster neighborhoods” within New York and, moreover, these neighborhoods are surrounded by a more extensive belt of tweets containing “bro” (perhaps best referenced as a bro-ghnut), suggesting a relatively clear spatial divide in these subcultures.

The artists/bankers map in exhibit 2 shows a much more variegated pattern with Twitter activity from self-identified bankers (hexagons with LQ > 1) concentrated, not surprisingly, in the financial district of Manhattan but also in exclusive residential areas of the Upper East and West Sides of Manhattan

<sup>3</sup> LQ is a ratio that compares local characteristics (in this case a single hexagon) with regional ones. An LQ of greater than 1 indicates that there are more tweets of a certain type (for example, about hipsters or from bankers) than is the regional norm, and the higher the score the more divergent a locality. Likewise, an LQ that is less than 1 indicates the relatively higher frequency of the contrasting type (for example, about bros or from artists).

## Exhibit 2

### Map of “Artists” and “Bankers” Tweets



JFK = John F. Kennedy International Airport. NJ = New Jersey. NY = New York.

and more suburban locations within easy commuting distance, such as Little Falls, New Jersey, and New Rochelle and Staten Island, New York. Also of interest is the concentration of banker activity at the regional airports, most clearly at John F. Kennedy International Airport but also evident at LaGuardia Airport and Newark Liberty International Airport. By contrast, artists are much more widely distributed within the city and region, with broad areas of activity in Brooklyn, Upper Manhattan, Queens, and the Bronx and also in New Jersey.

These two examples illustrate how social media data and flexible aggregation strategies can provide meaningful insight on the distribution of cultural-economic markers, such as identifying which parts of the city exhibit similar or contrasting patterns of messages and identity. Although social media data such as Twitter data are not appropriate for all questions (for example, it would be incorrect to use it to measure public opinion because Twitter users do not represent a random sample of all citizens or social media users), analysis of tweets also comes with the great advantage of not being restricted to the confines of Census Bureau-defined topics or areal units. The unstructured nature of Twitter messages and profiles allows for any number of topics (including quickly changing social practices) to be explored, and the point-based format of its observations allows for spatial aggregation in novel ways.

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## **Industrial Revolution**

Every home makes compromises among different and often competing goals: comfort, convenience, durability, energy consumption, maintenance, construction costs, appearance, strength, community acceptance, and resale value. Often consumers and developers making the tradeoffs among these goals do so with incomplete information, increasing the risks and slowing the adoption of innovative products and processes. This slow diffusion negatively affects productivity, quality, performance, and value. This department of Cityscape presents, in graphic form, a few promising technological improvements to the U.S. housing stock. If you have an idea for a future department feature, please send your diagram or photograph, along with a few well-chosen words, to [elizabeth.a.cocke@hud.gov](mailto:elizabeth.a.cocke@hud.gov).

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# **Key Behaviors of Residents Who Need Energy Education**

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## **Abstract**

*In the past decade, U.S. initiatives to promote sustainability in homebuilding have resulted in myriad choices of high-performance construction products and innovative technologies for contractors and homeowners. The Louisiana State University Agricultural Center has built a showcase home known as the LaHouse Resource Center (hereafter LaHouse), which serves as a permanent, evolving display of sustainable building ideas. Although educational displays like those at LaHouse have resulted in contractors and homeowners becoming more aware of the available technology options, the challenge remains in that residents' behaviors drive energy consumption and, therefore, changing their behavior would have the greatest effect in driving energy sustainability. Effective energy education is one approach for changing behavior, in particular for low-income residents, given that high rates of energy consumption may be disproportionate to their income and they may reside in less efficient homes than the rest of the population. This article identifies the three key behaviors of low-income residents that have been shown to drive energy usage and discusses alternatives for effective energy education.*

## The Status Quo

In recent years, U.S. policymakers have introduced many programs available to serve low-income residents that aim to improve the general condition of the houses and reduce their energy bills. Despite all efforts to date, remarkable amounts of research show that improving house condition with high-performance products and innovative technology is not enough. These improvement measures cannot be fully effective unless residents' behavioral patterns change as a result of effective energy-education methods. Residents' behavior is as important as the potential energy savings from using innovative and more efficient technology, accounting for at least 40 percent of energy variation among previous studies on energy usage of identical houses (Maier, Krzaczek, and Tejchman, 2009). Most recently, in a study on low-income housing in Philadelphia, Pennsylvania, 50 residents were interviewed regarding ideas for energy savings. Only one-half of the residents interviewed offered potential energy-saving suggestions, 32 percent of the ideas were related to compact fluorescent light bulbs, and 23 percent mentioned unplugging electronics and appliances (Langenvin, Gurian, and Wen, 2013). Although these ideas are certainly encouraging and good energy-saving practices, in general reduction on energy usage from switching to rated energy-efficient appliances will be counterbalanced by increases in population and appliance usage (EIA, 2014).

Identifying key behavioral tendencies of low-income residents and tailoring energy education to address those behaviors constitute a key challenge in the national agenda toward a more sustainable built environment. In particular, it is vital for low-income residents who share particular demographics and socioeconomic factors (for example, level of and access to education) to have accessibility to effective energy education. According to the American Housing Survey, of public housing residents nationwide, 67 percent are classified as extremely low income, 31 percent are elderly people, 35 percent are people with disabilities, and 47 percent have less than a high school diploma. In addition, the typical low-income household has less access to information than an affluent household.

## Low-Income Residents' Behaviors

Effectively addressing the energy efficiency of low-income households takes a dual approach: (1) improving the overall efficiency of the house and (2) providing energy education. Policymakers should target those who are most responsible for energy consumption: the residents. Residents' behaviors regarding energy consumption refer to actions and responses to stimuli that influence energy usage either directly or indirectly (Fabi et al., 2012). Some examples of such behaviors include window opening, use of air-conditioning (AC) units, AC temperature settings, and energy-saving practices (such as adjusting the temperature on a water heater, closing draperies, and so on). Further, addressing this challenge through residents' behavioral patterns as the main energy-usage strategy in low-income housing has some significant advantages (Langenvin, Gurian, and Wen, 2013; Maier, Krzaczek, and Tejchman, 2009; Plenur and Cruickshank, 2012).



1. Energy savings usually are achieved with minimal initial cost and without the expense of additional equipment.
2. Energy savings are quickly achieved when utilities are under the control of residents.
3. With time, residents develop energy-saving habits.

A recent research study in Louisiana sought to identify and rank the most significant behaviors of low-income residents in terms of the effect of the behaviors on energy savings (Nahmens et al., 2011). As a result of this study, three key behaviors of residents were identified for a hot and humid climate.

- **Behavior 1: Residents' behaviors regarding cooling set point during summer** are related to the temperature set by residents on their AC units: (1) the average temperature of the house during summer in the daytime while the house is occupied, (2) the average temperature of the house during summer in the daytime while the house is empty, and (3) the average temperature of the house during summer in the nighttime while residents are asleep.
- **Behavior 2: Energy-saving practices** are defined as any behaviors in which residents of a household engage that reduces their overall energy usage. Such behaviors include those related to the residents' day-to-day activities and interaction with the house, such as adjusting the temperature of the water heater; using the bathroom fan during and after showering; closing draperies, curtains, shades, and blinds in the summer; the number of loads of laundry washed in a week; and hanging cloths outside to dry.
- **Behavior 3: Residents' behaviors regarding indoor environmental quality** are related to the quality of the indoor air and other factors regarding the indoor environment that could affect the health and comfort of residents, such as the number of ceiling fans, frequency of use of ceiling fans, frequency of use of the kitchen exhaust fan, and frequency of changing the AC filter.

## **Energy Education for Residents**

Embracing energy-conservation behaviors in daily activities with the aim of developing new energy-efficient habits requires effective training programs. Educating and training households to consistently follow energy-efficient behaviors could bring about significant changes to energy usage for low-income residents and the residential sector as a whole. Effective energy-education programs need to consider the following two critical points. First, target behaviors that are likely to save the most energy. Second, use proven, effective educational strategies, such as demonstration techniques, that consider low-income residents' unique socioeconomics and demographics.

The most common energy-education strategies that energy companies, state offices, and contractors employ include the use of printed material, digital material, demonstration and hands-on techniques, and technology-based techniques (for example, real-time feedbacks and webinars). When educators

use printed material as part of their strategy, they usually provide residents a number of brochures, booklets, and manuals to review. Likewise, when they use digital material, they provide residents compact discs or digital video discs that typically contain a large amount of information. Research shows, however, that low-income residents are not likely to spend more than 15 minutes of their time reading those materials (Nahmens et al., 2012). Moreover, Wood and Newborough (2003) noted that these types of materials are usually effective in the short term, but they do not keep residents interested for a long time or result in long-term habits. Easy implementation of these types of educational strategies, however, makes them the main candidate for most educational programs on energy efficiency.

Another educational strategy is based on technology techniques, such as real-time feedback using products that continuously monitor energy usage and inform residents about their energy consumption. Previous research shows that this strategy has a greater effect on energy consciousness than on energy-conservation behavior in both high- and low-income households (Allen and Janda, 2006). Furthermore, the review of a number of different energy-education models in the context of energy programs for low-income residents reveals some challenges associated with technology-based techniques, particularly in achieving the specific goal that technology was designed to address. In most cases, technology is designed to provide the client with tailored information on energy consumption and energy-saving opportunities. Yet, results reveal that technology has failed to keep the resident motivated to take the action. In addition, most technology-intensive tools for energy education are costly (Carroll and Berger, 2008).

Demonstration is another energy-education strategy that educators use to change the behavior of low-income households. This strategy involves direct interaction between a credible energy-education professional and residents, along with hands-on experiences by the resident. For instance, they educate residents about how to manage the temperature for the water heater, refrigerator, and furnace and how to use setback procedures on the thermostat (Nahmens et al., 2012). Furthermore, it is critical for educators to demonstrate the connection between the temperature setting on the thermostat and the amount of energy consumption. Thus, this strategy highlights the effect of the newly learned behaviors on their energy bill.

In Louisiana, a home-energy performance study was conducted and energy-efficiency education provided to homeowners after the state improved their houses with energy-efficient measures (Nahmens et al., 2012). Results from this study showed that energy savings ranged widely among homeowners who received and did not receive energy education. Those homeowners whose energy education was based on demonstration had significantly more energy savings (46 percent on average) than those whose education was based on the other types of energy-education strategies used. Energy-education strategies are usually evaluated in terms of overall energy savings and cost effectiveness. Findings from other studies in this area show evidence that the most promising tactic for changing behavior in low-income households is the direct demonstration of various energy-saving methods and behaviors through presentations by a reliable energy-education expert, along with the hands-on experience of residents (Carroll and Berger, 2008; Gregory, 2007; Nahmens et al., 2012).

## Final Remarks

This article highlighted the most significant behaviors that drive energy consumption in low-income households and the strengths and weaknesses of frequently used educational strategies for reduced energy consumption in those households. Educators need to target the behaviors of these residents, and owners of the properties in which these residents live need to implement high-performance construction products and innovative technologies to move toward a more sustainable built environment. Residents' behaviors related to (1) cooling set-point, (2) energy-saving practices, and (3) indoor environmental quality are the most significant behaviors that drive the energy consumption of low-income households in a hot and humid climate. Hands-on and demonstration components in the energy-education process are recommended as an effective strategy for low-income residents. For example, physically showing and guiding residents in the process of setting their programmable thermostat, while explaining what the optimal temperatures for summer and winter would be for their houses based on the condition of their houses. In addition, "dollar bill" or other visual aids can be used to illustrate the financial prize of those thermostat settings and other energy-saving practices.

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## Foreign Exchange

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# Chile's New Rental Housing Subsidy and Its Relevance to U.S. Housing Choice Voucher Program Reform

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*The views expressed in this article are those of the authors and do not represent the official positions or policies of the Office of Policy Development and Research, the U.S. Department of Housing and Urban Development, or the U.S. government.*

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## Abstract

*Until recently, rental housing policy was largely absent throughout South America as governments widely supported homeownership. Amid growing recommendations for rental sector interventions in South America, at the start of the 2014, Chile was the first country in South America to adopt a national rental subsidy program—one aimed at making rental housing more affordable to low- and moderate-income young families. This article presents an overview of Chile's rental program and its relevance for U.S. rental subsidy reform. Chile's program consists of a flat-rate, time-limited subsidy that offers a degree of administrative simplicity and payment flexibility for tenants facing income volatility. In the United States, policymakers have flirted with building these program elements into the United States' longstanding Housing Choice Voucher Program. Although the Chilean and U.S. rental subsidy models operate within different contexts,*

### **Abstract (continued)**

*as discussed in the article, a close examination of Chile's implementation and outcomes has the potential to inform U.S. rental housing policy reform. The authors also address the unique opportunity for monitoring and evaluation offered by Chile's program.*

## **Introduction**

Although more than one-half of families across South America's biggest cities cannot afford to buy a proper formal dwelling, national housing strategies throughout the region largely ignore the rental housing sector.<sup>1</sup> Until recently, rental housing policy was largely absent throughout South America as governments widely supported homeownership. Amid growing recommendations for rental sector interventions in South America at the start of 2014, Chile was the first country in South America to adopt a national rental subsidy program.<sup>2</sup> Chile's first rental subsidy program aims to make rental housing more affordable to low- and moderate-income young families throughout the country.

This article presents an overview of Chile's rental subsidy program and its relevance for U.S. rental subsidy reform. The article highlights key features of Chile's new rental subsidy model and its relevance for U.S. policy. In particular, Chile's program consists of a flat-rate, time-limited subsidy that offers a degree of administrative simplicity and payment flexibility for tenants facing income volatility. In the United States, policymakers have flirted with building these program elements into the long-standing Housing Choice Voucher Program (HCVP). Although the Chilean and U.S. rental subsidy models operate within different contexts, as we discuss in the following sections, a close examination of the Chilean implementation and outcomes shows that the Chilean model has the potential to inform U.S. rental housing policy reform.

## **Current State of Housing Policy in Chile**

Chile is an upper middle- to high-income country. Its per capita income is roughly \$14,000, the highest in South America (World Bank, 2013a).<sup>3</sup> Chile also has one of the fastest growing economies throughout the region and a reputation for well-functioning and innovative social policy (OECD, 2009; World Bank, 2013b). During the past 30 years, the Chilean government has consistently supported growth and trade and has seen a substantial decline in poverty to a rate that is currently among the lowest in South America. In 2010, Chile was the first South American country to join

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<sup>1</sup> For an overview of housing conditions in South America and the Caribbean, see Bouillon (2012).

<sup>2</sup> For more information on the rental housing sector and policy options in Latin America and the Caribbean, see Blanco, Fretes, and Muñoz (2014).

<sup>3</sup> Calculated using the Atlas Method.

the Organisation for Economic Co-operation and Development (OECD).<sup>4</sup> Despite strong economic growth, however, Chile has one of the highest rates of poverty and the greatest level of income inequality compared with those of the other OECD countries. Improving housing conditions and better targeting housing policy to those most in need have become national priorities and are being used as tools for reducing poverty and inequality (OECD, 2012).

Throughout South America, Chile has been and continues to serve as a model for housing policy.<sup>5</sup> During the past 20 years, key features of Chile's housing policy have supported homeownership for low- to moderate-income households. Policies have included household savings schemes, housing subsidies delivered by the state, and government facilitation of long-term mortgages, all of which have significantly contributed to the growth of formal and mortgage-backed homeownership. Chile also began the trend in South America of constructing government-subsidized housing estates that provide good-quality housing for sale in neighborhoods with infrastructure and services. In cases in which housing is in large, government-supported, multifamily facilities, the Chilean government may fund upward of 95 percent of the costs for a unit (MINVU, 2013).

As a result of these efforts, Chile's housing deficit is relatively minimal—across South America, Chile has the lowest incidence of poor-quality housing; that is, housing unsuitable for habitation and that lacks basic infrastructure services.<sup>6</sup> Housing policy in Chile has never addressed the needs of renters, however, and the policy focus on homeownership likely has squeezed the rental market in Chile. When compared with other OECD countries, Chile's rental housing market is considerably underdeveloped; rental housing comprises only 17 percent of the housing stock compared with 35 percent in the United States. Results from a recent economic survey of the country suggest that credit-constrained households, especially those that are young or have low incomes, often have to live with their parents or family or resort to other living situations that likely contribute to overcrowding (OECD, 2012).

## **Chilean Rental Subsidy Program: Objectives and Design**

At the onset of designing its rental subsidy program, Chile's Ministry of Housing and Urban Development (MINVU) conducted a diagnostic survey of the rental sector. MINVU found that, although the greatest proportion of renters was in the higher income brackets, those who rented informally (without contract and with greater housing instability) were concentrated among the lowest income segments. Using additional data, the administration made a few observations regarding the potential for developing and expanding the formal rental housing market. Major conclusions indicated that—

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<sup>4</sup> Created in 1960 by 18 European countries plus the United States and Canada as a forum for western industrial countries, OECD began with a mission to build and deepen these countries' integration and the postwar recovery. OECD membership informally has come to signal that a country's level of development has reached a point at which its economic and social indicators can be compared meaningfully with those of the other members of OECD.

<sup>5</sup> For more information on the evolution and predominance of Chilean housing policies, see Navarro (2005) and Gilbert (2002).

<sup>6</sup> For an overview of housing conditions in South America and the Caribbean, see Bouillon (2012).



1. Most renters younger than the age of 30 perceived their current home as temporary (1 to 3 years).
2. On average, family size was smaller for renters younger than the age of 30, suggesting that families continue to grow after age 30.
3. More than one-third of those who benefit from Chile's housing subsidies that support the acquisition of a home for the lowest income families were less than 30 years of age (MINVU, 2013).

These findings indicate that Chile's housing subsidies are poorly targeted, as new for-sale homes are being provided to families who are likely to need to move in a few years (for employment and other reasons) as their family expands.

As a result of these conclusions, MINVU designed the country's first large-scale rental subsidy program to support low- and moderate-income young families as they decide their long-term housing needs. The highly targeted program is a demand-side effort,<sup>7</sup> but, unlike HCVP, Chile's rental program is viewed more as bridge assistance to more permanent owned housing.

To be specific, the program targets vulnerable and emerging families with household heads who are 18 to 30 years old with a total monthly income of between \$360 and \$1,125. Eligibility is determined not solely by income (which can be hard to measure, with the presence of a substantial informal economy and poor systems for income reporting) but instead by a Social Vulnerability Score measured by a government-issued survey.<sup>8</sup> The program is open to current tenants and other nonpaying users and does not have any geographic restrictions. The program also requires establishing a savings account with at least \$180.

In addition to renters needing to meet the previously listed requirements, the housing where the subsidy is used must also meet certain physical requirements to ensure a decent and safe standard of livability. This feature, as in HCVP, is intended to influence the quality of housing a household may choose and, at a broader scale, to improve the quality of rental housing in the market. MINVU's 15 regional offices will carry out housing inspections before the signing of rental and program contracts.

The subsidy is designed as a 5-year, flat-rate voucher of \$140 per month. In the fourth and fifth years of the subsidy program, MINVU plans to slightly decrease the subsidy amount with the goal of having renters pay an amount that reflects typical monthly payments if they were to enroll in government-sponsored homeownership programs when their subsidy expires. Total rent can vary but is capped at \$400. In cases in which rent reaches the cap, the payment will cover 43 percent

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<sup>7</sup> Demand-side means the program facilitates households in securing housing but does not supply specific housing for the recipients (supply-side). MINVU has expressed its interest in developing supply-side mechanisms to support the rental market soon after the implementation of the demand-side program.

<sup>8</sup> In Chile, eligibility criteria for accessing a variety of government programs and subsidies rely on a Social Vulnerability Score generated through a survey instrument called the Social Protection Record Card, or *Ficha de protección social*. The score measures vulnerability based on three major indicators: (1) access to economic resources (for example, income, labor skills, access to water and sanitation, and relationship of family size to house size), (2) household needs (for example, family composition, household size, and other household characteristics), and (3) risks that households face (for example, individual health conditions, geographic location, and job insecurity). This comprehensive list of indicators attempts to capture the multiple dimensions of poverty and social vulnerability.

of the total cost, leaving the tenant to contribute the remaining portion. According to MINVU, the goal of the subsidy is to enable households to contribute, on average, 25 percent of their total earnings to rent. These estimates indicate that the rental subsidy likely will serve as only a shallow subsidy for those who are worse off and must pay a greater proportion of their lower incomes as their contribution for housing.

Chile also built a considerable amount of flexibility into its rental subsidy program because of frequent income instability. Tenants can technically miss a payment three times during their tenure in the program before they are ineligible to receive the subsidy. If they miss a payment, tenants have the option to repay in a subsequent month, thereby starting with a clean slate. When tenants miss a payment, MINVU does not cover their share of rent; instead, landlords forgo that portion of rent for the month. This stipulation is part of the contract agreement between the government and landlord at the onset of the program.

MINVU's 15 regional offices carry out application, enrollment, and housing inspections, but the administration of the rental subsidy relies heavily on private banks. Eligible recipients are required to select an adequate housing unit from the private market and sign a contract with the owner. After the contract is signed, voucher recipients deposit their share of the monthly rent payment into a specified bank account. MINVU deposits the subsidy amount into the same account, and the bank issues the total rent amount to the owner. In this model, banks take an important administrative and intermediary role, because all vouchers are bank issued. According to MINVU, banks administer the subsidy program at no cost based on the assumption that the program attracts new customers, especially traditionally unbanked households. Note again that, although private banks administer subsidy payments, MINVU's regional office carries out regular randomized inspections. This system ensures that the specified renters are indeed living in the registered and approved rental unit and that units are not being used for business activities, as it is common to operate businesses out of residential properties in Chile.

In addition, although this rental subsidy program is not a lease-to-own program, payment performance among voucher recipients can serve as a credit-scoring type of indicator for future state-sponsored ownership programs. If voucher recipients meet all payment obligations under the subsidy program, they are more competitive in the future for national homeownership programs that are administered through the banks.

## **How the Chilean Program Compares With HCVP**

In designing its first rental subsidy program, MINVU studied the technical details, experience, and criticisms of HCVP. Although many elements of HCVP were not easily transferrable because of various economic, institutional, and cultural differences, Chile's program includes several features of HCVP (exhibit 1).

Most striking in exhibit 1 is that, along with the similarities, Chile's rental subsidy program has several remarkable features that speak to current proposals for HCVP reform. The next section identifies several features of the Chilean rental subsidy model that are relevant to proposed HCVP reforms in the United States.

**Exhibit 1**

**Comparison of HCVP and MINVU Rental Subsidy Program**

HCVP	MINVU Rental Subsidy Program
<ul style="list-style-type: none"> <li>Administered by 2,300 state and local public housing agencies.</li> </ul>	<ul style="list-style-type: none"> <li>Administered by the national government and private banks, with inspections and other oversight by regional offices.</li> </ul>
<ul style="list-style-type: none"> <li>Voluntary landlord participation.</li> </ul>	<ul style="list-style-type: none"> <li>Voluntary landlord participation.</li> </ul>
<ul style="list-style-type: none"> <li>Income-based eligibility.</li> <li>No time limit.</li> <li>All low-income households, some displaced households, and homeless veterans are eligible, but participation is limited by funding caps and the rate at which existing vouchers turn over.</li> </ul>	<ul style="list-style-type: none"> <li>Eligibility based on Social Vulnerability Score.</li> <li>5-year time limit.</li> <li>Participation is open to low-income households with heads of households younger than age 30.</li> </ul>
<ul style="list-style-type: none"> <li>Voucher recipients choose units on the private market.</li> </ul>	<ul style="list-style-type: none"> <li>Voucher recipients choose units on the private market.</li> </ul>
<ul style="list-style-type: none"> <li>Federal Fair Market Rents, using recent data, determine maximum local program rents.</li> <li>Recipients contribute a minimum of 30 percent of their income toward rent, and the program pays the difference up to a locally defined limit (or payment standard).</li> <li>No payment flexibility; tenants are required to make the same contribution each month.</li> </ul>	<ul style="list-style-type: none"> <li>National mandated cap on rent.</li> <li>Recipients receive a flat-rate voucher of \$140 per month.</li> <li>Payment flexibility, allowing for debt repayment.</li> </ul>
<ul style="list-style-type: none"> <li>Units must meet defined quality standards.</li> </ul>	<ul style="list-style-type: none"> <li>Units must meet defined quality standards.</li> </ul>

*HCVP = Housing Choice Voucher Program. MINVU = Ministry of Housing and Urban Development (Chile).*

**How the Chilean Program Relates to U.S. Reform Proposals**

Exhibit 2 lists the five key policy differences between the Chilean and U.S. housing voucher programs that this article considers.

**Exhibit 2**

**Policy Differences and Hypothesized Benefits of MINVU Rental Subsidy Program Relative to Current HCVP**

Policy Difference	Hypothesized Benefits
Flat payment	<ul style="list-style-type: none"> <li>Reduces payment error.</li> <li>Removes earnings disincentive.</li> </ul>
Time-limited duration	<ul style="list-style-type: none"> <li>Limits dependency.</li> <li>Reaches more households.</li> </ul>
Administration through private banks	<ul style="list-style-type: none"> <li>Streamlines administration.</li> <li>Encourages asset building.</li> <li>Better facilitates portability.</li> </ul>
Eligibility determined by a Social Vulnerability Score	<ul style="list-style-type: none"> <li>Better targets households with greatest need.</li> </ul>
Payment flexibility	<ul style="list-style-type: none"> <li>Addresses income volatility.</li> <li>Can prevent eviction or otherwise limit the financial disruption of a reduction in wages, unemployment, illness, and so on.</li> </ul>

*HCVP = Housing Choice Voucher Program. MINVU = Ministry of Housing and Urban Development (Chile).*

In particular, moving to a flat payment or a few tiered payments is thought to address two major critiques of HCVP. The first critique is that the current process to determine the income of an individual tenant and, with that, their contribution to rent is complicated to administer and prone to error and potential fraud (GAO, 2012a). Using a flat subsidy greatly simplifies subsidy determination and reduces the opportunities for improper payment. The second critique is that the current subsidy reduces the incentive to work, acting as a 30-percent marginal tax on earnings. The tenant will see only 70 cents of every dollar of increased take-home pay because the tenant's contribution to rent, pegged at roughly 30 percent of income, also increases.<sup>9</sup> A flat subsidy is likely to provide less assistance to lower income households than the current approach, but flat-rent proponents argue that it provides a stronger incentive for recipients to increase earnings because they will benefit from the entirety of each additional post-tax dollar earned.

The second difference of interest in the two programs is the duration of the subsidy. Limiting the duration of assistance in HCVP to a few years has been considered in the United States as a way to address concerns about recipients becoming dependent on the program and the lack of turnover. Because housing assistance is not an entitlement, its ability to help new households is limited when recipients do not leave the program. In many major metropolitan areas across the United States, HCVP waiting lists hold thousands of eligible applicants, in many cases causing the waiting lists to close.<sup>10</sup> Proponents of this reform argue that if assistance were time limited, households receiving assistance would have little time or incentive to become dependent on the subsidy, and assistance would regularly become available for waiting households.

The third policy-relevant difference is relying on existing private financial institutions and payment channels to administer the program. Payments in HCVP currently flow from HUD through local public housing agencies (PHAs), using a complex system of intergovernmental accounting. In the United States, the administrative costs of the program and policing improper payments are perennial concerns. The Chilean program's system of payments is meant to be simple and minimize government involvement in an effort to keep administrative costs low and reduce the opportunities for corruption. Banks operate the Chilean program free of cost with the goal of acquiring new customers, especially the traditionally unbanked. Although the same strategy might not apply in the United States, closer relationships between private formal institutions and people receiving housing assistance might be a first step toward asset building among these groups.

The current HCVP payment system also complicates tenant mobility. In the HCVP system, the *portability* of assistance (that is, the ability of a recipient to move across PHA boundaries while maintaining HCVP assistance) requires complex financial reconciliation between sending and receiving PHAs. It also relies on government accounting systems, which may contribute to landlords' reluctance to participate (Galvez, 2010). Single payments made directly to landlords' private bank

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<sup>9</sup> For more information about the relationship between housing assistance and labor and respective methodological approaches, see Shroder (2010, 2002).

<sup>10</sup> Few published surveys of voucher waiting lists exist. Examples include HUD (1999) and NLIHC (2004). Recent data from HUD-approved PFA plans show the occurrence of closed waiting lists is unabated.

accounts through the private banking system could greatly reduce the complexity associated with the program, improve portability for recipients, and make the program more comprehensible and familiar to potential landlords.<sup>11</sup>

The fourth difference of note in the Chilean program is the Social Vulnerability Score, a broad, multidimensional index of need that MINVU will use to determine the priority among eligible households. In the United States, eligibility is determined primarily by income. Over time, various deductions from income have been used to determine applicants' eligibility and subsidy levels. Preferences in distributing assistance to households with specific characteristics of need, such as being homeless or including a veteran, have also been applied to better target assistance. Despite frequent adjustments to this system, however, debate continues about the perceived need for simplification and better targeting of HCVP resources to those most in need (Pelletiere, 2008).

Finally, the payment flexibility in the Chilean program is worth considering in the U.S. context. In the United States, attention has recently focused on providing emergency housing assistance during specific periods of need to prevent eviction or to otherwise limit the financial disruption of a temporary setback, such as a reduction in wages, unemployment, or illness.<sup>12</sup> Emergency housing assistance was brought to the fore by the recent recession, but income volatility grew substantially in the decades before. In the 1970s and 1980s, immediately after the genesis of the HCVP, income volatility among low-income households grew substantially, and it has not diminished in subsequent years. This trend is explained in part by structural changes in the labor market, but welfare policy has also played a role. Reforms in the 1990s reduced assistance and emphasized work (often temporary or part-time work) and imposed time limits and other changes that increased month-to-month income volatility (CBO, 2007; Celik et al., 2012; Dynan, Elmendorf, and Sichel, 2012). The largest program assisting the working poor today, the Earned Income Tax Credit, which was introduced in 1975 and greatly expanded in the 1980s and 1990s, provides relatively large lump-sum payments once a year through a tax refund.

Thus, even with sufficient *annual* income to meet expenses, month-to-month housing and similar expenses can be a challenge, requiring relatively large payments even during significant ebbs in income. The Chilean program anticipates that recipients will need breathing room at times by allowing up to three missed tenant contributions without endangering their subsidy. The flexibility is available to all voucher recipients without having to receive prior approval such as a financial hardship exemption or an income recertification as in the U.S. context. In the United States, no regular, long-term rental assistance program anticipates emergency assistance or the need for payment flexibility in this way.

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<sup>11</sup> As noted previously, the Chilean program does not do away with regulatory requirements in general. Landlords participating in the program are subject to housing inspections and eligibility certifications.

<sup>12</sup> An example at the federal level is the Homelessness Prevention and Rapid Re-Housing Program, which provides financial assistance and services to prevent individuals and families from becoming homeless and to help those who are experiencing homelessness to be quickly rehoused and stabilized.

## **The Need for Evaluation**

Heightening the potential policy relevance of the Chilean program in the U.S. context is the fact that the United States has little experience with these reforms and even fewer formal evaluations of them.

Flatter rent structures and time limits have been implemented by PHAs in the Moving to Work (MTW) demonstration program. Among the 33 agencies in the program in 2011, the vast majority had implemented alternative income and rent policies. According to the Congressional Research Service, 7 agencies had implemented tiered rents, 9 agencies had implemented flat rents, and 5 agencies had implemented time limits for assistance, ranging from 3 to 7 years (Brick and McCarty, 2012). The implementation of data collection for the demonstration sites has complicated the analysis, however, and the unavailability of formal controls or similar comparisons has hamstrung researchers in what they can learn about the effect of these reforms (Brick and McCarty, 2012; Cadik and Nogic, 2010; GAO, 2013, 2012b).

The Jobs Plus demonstration<sup>13</sup> rigorously tested a flat rent incentive but only as part of a larger set of reforms and interventions meant to encourage work.<sup>14</sup> A 2010 review for HUD looked at the range of research available and rent policies and the use of rent alternatives across PHAs, including Jobs Plus (Abt Associates, 2010).<sup>15</sup> Although the report noted the limitations of the data and evaluations available, it concluded that a flat rent/flat subsidy structure increases the incentive for assisted households to work, but the actual increase in work is likely to be minimal.

HUD is currently implementing a further demonstration of rent reform within HCVP at MTW agencies that have yet to implement significant rent reforms. This demonstration will rigorously test alternatives to current rent policies. Previous implementation and evaluation within the MTW program has occurred more on an ad hoc basis. Among the reforms likely to be evaluated are revised hardship policies to protect tenants with exceptional circumstances from harm. Considerable interest exists within HUD in streamlining payments and portability policies to aid mobility and cut administrative costs. The policy focus in this area has been on PHA consolidation and cooperation. Reforms or evaluations to assess alternative means of delivering assistance or time limiting HCVP assistance have not been considered outside of what can be learned from MTW sites.<sup>16</sup>

With the recent focus on cutting administration costs and streamlining current programs and, given the traditional focus on income limits and deductions to better target assistance to those in need, less interest has centered in the United States on more comprehensive measures of need in distributing and administering assistance. Therefore, the Chilean Social Vulnerability Score does not relate to any active proposal for reform. This approach, however, does address a frequent criticism

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<sup>13</sup> For details about this program, see Blank and Wharton-Fields (2008).

<sup>14</sup> Jobs Plus used a flat rent that would not increase when income increased but also would not exceed 30 percent of income if income declined. The households in the control projects continued to pay 30 percent of income.

<sup>15</sup> In addition to MTW-related reforms, the Quality Housing and Work Responsibility Act of 1998 required all PHAs to offer public housing tenants a flat rent option similar to that used in Jobs Plus on a voluntary basis.

<sup>16</sup> The Experimental Housing Allowance Program that was under way at the time HCVP was taking shape in the 1970s delivered housing assistance to tenants directly as part of a rigorous evaluation. See, for example, Fitts (1978).

of housing assistance in the United States as not reaching the most vulnerable or most deserving households (Pelletiere, 2008). The Social Vulnerability Score is an approach to allocating subsidy that has not been tried in the United States, so there may be a lot to learn.

Monitoring and evaluating the Chilean program holds the promise of adding to our knowledge of alternative rental assistance structures and options in the United States. Research into the effect of flatter rent structures has been far from exhaustive. The other variations discussed previously have not been researched and evaluated in any significant way.

## **What Can Chile's Experience Tell Us?**

Chile is not the United States. The rental market context for implementing the new policy is very different from what is found in the United States economically, demographically, geographically, institutionally, historically, and culturally. As discussed previously, rental assistance is new to Chile, so we cannot assess these reforms against an existing program. Although Chile is likely to be interested in evaluating its new policy, this evaluation will be relative to its own current status quo of unassisted renters and assisted homeowners. Chile would gain little from establishing an alternative policy more similar to HCVP as a control, which would be necessary to make the findings more directly relevant in the U.S. context.

Beyond the obvious differences between Chile and the United States, the fundamental purpose of the program being implemented in Chile differs from that of HCVP. As described previously, after a review of the rental market, the Chilean policy was designed to support young, low- and moderate-income families as they decide their long-term housing needs. HCVP was initially implemented as a general housing assistance policy and a market-based or demand-side alternative to project-based (supply-side) programs, particularly public housing. The United States initially targeted public housing at higher income households, but, by the 1970s, public housing was more firmly part of the social welfare system, becoming the housing of last resort for the lowest income families. HCVP was primarily intended to provide this general low-income housing assistance more efficiently by relying on the private market. Over time, fostering economic and racial integration has become an increasingly important objective (Pelletiere and Crowley, 2012).

Thus, the differing context and purposes of the Chilean program mean that the likely measures of success in an evaluation of reforms in the U.S. context—cost effectiveness relative to other rental programs and the capacity to overcome housing market segregation—are less relevant when assessing the Chilean case. Monitoring and evaluating Chile's program will not directly address the paucity of evidence regarding reforms to HCVP or replace the need for domestic evaluations and demonstrations.

Despite these important differences, the approach being taken in Chile is innovative and directly related to the experience and reforms being considered for HCVP in the United States. Studying how these program aspects operate and how program participants in Chile experience them can inform how we design future demonstrations and evaluations of reform to HCVP in the United States.



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## SpAM

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# Who Can Access Transit? Reviewing Methods for Determining Population Access to Bus Transit

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## Abstract

This article explores the use of Geographic Information Systems in determining transit-service areas. The traditional methods of determining the population that can access transit are briefly reviewed, and a new method is proposed. The parcel-network method takes advantage of the spatial and aspatial attributes of parcels, and the ability to easily determine network distances from parcels to bus stop locations. This parcel-network method avoids the well-known and unrealistic assumptions associated with the existing methods, and reduces overestimation of the population with access to transit, resulting in improved spatial precision and superior inputs to transit-service decisionmaking processes. The way in which this new method is performed is examined in detail. The study area consists of a section of the bus network within the Dallas metropolitan area. This article summarizes the work of the authors in a research article entitled, "A New Method for Determining the Population With Walking Access to Transit" and published in the International Journal of Geographical Information Science (Biba, Curtin, and Manca, 2010).

## Introduction

It has long been recognized that Geographic Information Systems (GIS) are a useful tool for transportation modeling given the ability to realistically model linear and network features (Curtin, 2008a, 2008b, 2007). These features can, in turn, be used to determine the service areas—and the associated populations within those areas—for transit routes in order to perform transit planning (DART, 2002). Unfortunately, several commonly used methods consistently overestimate the population with access to transit (O'Neill, Ramsey, and Chou, 1992; Zhao et al., 2003), and therefore transit planners can lose confidence in the ability of GIS to provide reliable answers to questions concerning the changes in accessibility that will be achieved by changes in service.

This article reviews the traditional GIS methods for determining access to transit and presents an improved method for doing so—the parcel-network method. This method employs disaggregate cadastral data with network functionality to determine walking distances to transit facilities in order to more precisely estimate the population with access to transit. This method provides more conservative population estimates than the methods currently in use, it produces summary statistics and output datasets that cannot be generated through the other methods, and it provides a more flexible basis for further refinement of the transit forecasting and planning process. Examples are included using a set of data from the north Dallas region. A quantitative comparison of the results is made for the buffer, network-ratio, and parcel-network methods. This article summarizes the work in a research article entitled, “A New Method for Determining the Population With Walking Access to Transit” published in the *International Journal of Geographical Information Science* (Biba, Curtin, and Manca, 2010).

## Traditional Methods for Determining Transit-Service Areas

Historically, transit-service area determination has been implemented within GIS by creating a distance buffer around the transit route, or around stops along that route (Ayvalik and Khisty, 2002; Hsiao et al., 1997; Peng et al., 1997), and estimating the population within that buffer based on an overlay of census polygons. The buffer method (or area ratio method) assumes a uniform distribution of population within the census polygon, which is frequently not the case. Moreover, this method implies that the entire population within the buffer has walking access to the transit route. Unfortunately, the buffer method has been shown to consistently overestimate the population within the service area since the actual walking distances within the buffer are greater than the Euclidean distances used to generate the buffer (Horner and Murray, 2004; O'Neill et al., 1992). The level of overestimation has been shown to be influenced by the size of the analysis zone, and therefore experts recommend that the smallest practical level of population aggregation be employed (Handy and Niemeier, 1997; Lee, 2005).

### The Network-Ratio Method

O'Neill et al. (1992) used a refined method—termed the network-ratio method—to more accurately measure accessibility to transit services. This method considered the total length of the street

network within analysis zones surrounding a transit route, and the length of the streets within those zones that are also within a specified network distance from the transit stops. The formula for computing population with access to transit with the network-ratio method is—

$$A_i = (W_i / M_i) \times P_i \tag{1}$$

Where:  $A_i$  = the population in analysis zone  $i$  with access to transit,  $M_i$  = the total length of street network in analysis zone  $i$ ,  $W_i$  = the length of the street network within walking distance to transit in zone  $i$ , and  $P_i$  = the total population of zone  $i$ .

Although the network-ratio method eliminates the error associated with the assumption of uniform population distribution over census polygons, it does assume that population along a street is proportional to street length, and that there is a uniform distribution of population on every street. This assumption is particularly weak in mixed residential zones or zones with retail, industrial, and recreational activities, which are precisely the kinds of areas that are likely to have transit routes. Lastly, if the network-ratio method includes all roads within walking distance of a transit facility, highways and their associated frontage roads and off-ramps can lead to substantial error in the population estimates. In fact, research has shown that these limitations of the network-ratio method lead to consistent overestimation of the population with walking access to transit, although the errors are not as large as those seen with the buffer method (Zhao et al., 2003).

Although we do not review the information here, the definition of “access to transit” is a subject of considerable research. We point the readers to Biba, Curtin, and Manca (2010) for a detailed review of the literature regarding walking distances to transit. Suffice it to say that the methods described below can be employed with any distance determined to be appropriate for a particular transit access study.

## **The Parcel-Network Method**

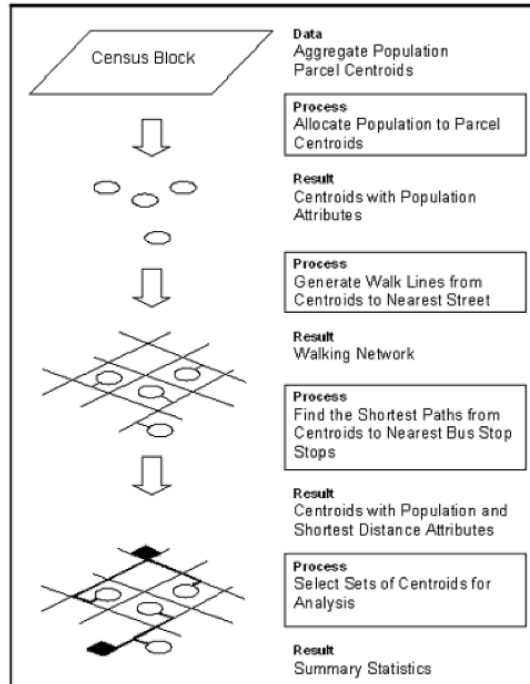
The parcel-network method exploits both the superior precision of parcel databases and the network functionality that has been increasingly incorporated into GIS. Moreover, cadastral databases also include attribute information such as street addresses and land use or zoning categories (residential, commercial, and so on). Parcels provide a level of spatial accuracy that has not previously been exploited for transit access studies, and that accuracy allows for detailed modeling of walking access to transit facilities. The parcel-network method differs from traditional methods of determining access to transit in that it looks outward from the population locations (the parcels) to the transit features, rather than looking out from the transit features and making assumptions about what population lies within some distance of those features.

Implementing the parcel-network method requires four major steps, some of which have several sequential processes (exhibit 1). The first task is to apply demographic characteristics to the parcels; the second task creates a walking network from parcels to the transit facilities; the third task is to compute network walking distances from each parcel centroid to its nearest bus stop; and finally analysis is performed to assess the population that can access the transit facility across the walking network. These tasks represent a novel combination of parcel-based attribute imputation with network analytic techniques.



### Exhibit 1

#### The Parcel-Network Method



### Step 1. Demographic Attribute Transfer

In the absence of building footprints in the cadastral database (as was the case in our data), the centroid of the parcel is a reasonable representation of the starting point for pedestrians seeking transit. Thus, the first step in the parcel-network method is to generate centroid points for all parcel polygons in the study area. Although the centroid could fall outside of the parcel polygon if the shape were irregular, in practice there are very few residential polygons where this is the case. Pertinent attribute information (based on the census blocks or other supplementary data) can then be associated with the parcel centroids. This step highlights the flexibility of the parcel-network method in that it allows users a great deal of latitude in choosing how they model the characteristics of the population under consideration. That is, the population of employees at commercial or industrial parcels could be considered, the population of students at parcels containing educational institutions could be an input, or the residential population could be of primary interest.

Since, in the research presented here, the object was to identify the total residential population with access to transit the total number of dwelling units per census block was computed, the population per dwelling was computed and transferred back to the parcel centroids, and the estimated population was computed for each parcel. Note that each parcel (and its centroid) is associated with a variable number of dwelling units. A parcel containing one single-family home would have

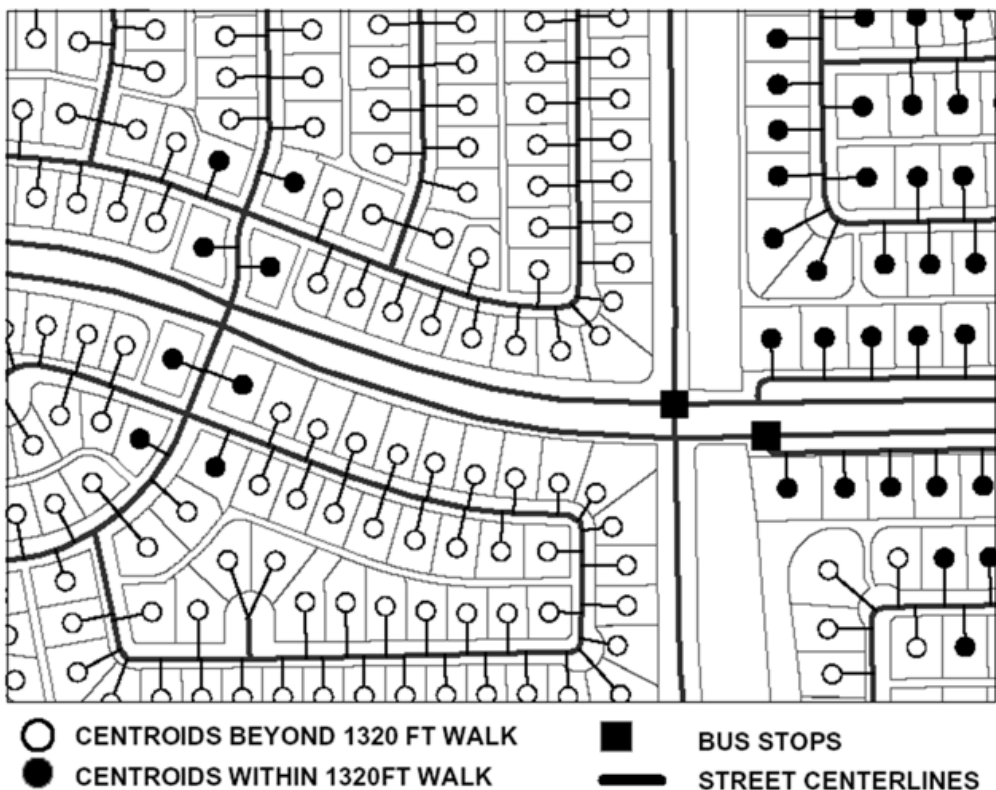
only one dwelling unit associated with it. A parcel with multiple dwelling units (such as an apartment building) would be assigned a population in proportion to the total number of dwelling units in the census block. The result is a set of parcel centroids that now have reasonable population attributes. A wealth of other demographic data could be associated with parcel centroids in this way (income, car ownership, and so on) if a particular transit research project demanded it.

## Step 2. Creating a Walking Network

Given that the street network does not connect to the parcel centroid points that now have associated attribute information, new links in that network must be generated in order to find the walking paths that pedestrians would follow. In order to do so an automated process was employed within the GIS to select each centroid, identify the point on the street network closest to that centroid, and generate a new network link connecting those two points. The result is a set of parcel centroids with population attributes and network connections to the walking network (exhibit 2). If one uses the addressed street to generate the walking path from the centroid it is virtually certain there will not be a barrier for a pedestrian.

### Exhibit 2

Parcel Centroids and the Walking Network



### **Step 3: Computing Walking Distances**

With the parcel centroids connected to the street network, an origin for a walking trip to transit has been defined. For the purposes of this research, the destinations are potential bus stops along the existing bus routes. In our study area potential bus stops are located at all intersections along a bus route.

The next step in the parcel-network method is to generate walking network distances between all of the origins and destinations, and then choose the smallest of those distances for each parcel centroid. There are extremely efficient shortest path algorithms implemented in industry standard GIS software products that can be used to populate such origin-destination matrices.

Once the shortest path to a bus stop is determined, the distance traveled and the closest bus stop can be transferred as attributes to the parcel centroids. At the conclusion of the first three stages of the parcel-network method, the result is a set of parcel centroids with population, the distance to the nearest bus stop, and the identifier for that bus stop.

### **Step 4: Determine Population With Transit Access**

The fourth and final step in the parcel-network method is to use these data sources to determine the population with access to transit. We can now estimate the population in any distance band from a transit facility. In this study we chose to select those centroids where the walking distance is 0.25 mile or less to the bus stops of each distinct route. Based on this selection a summary of the population associated with each route can be made.

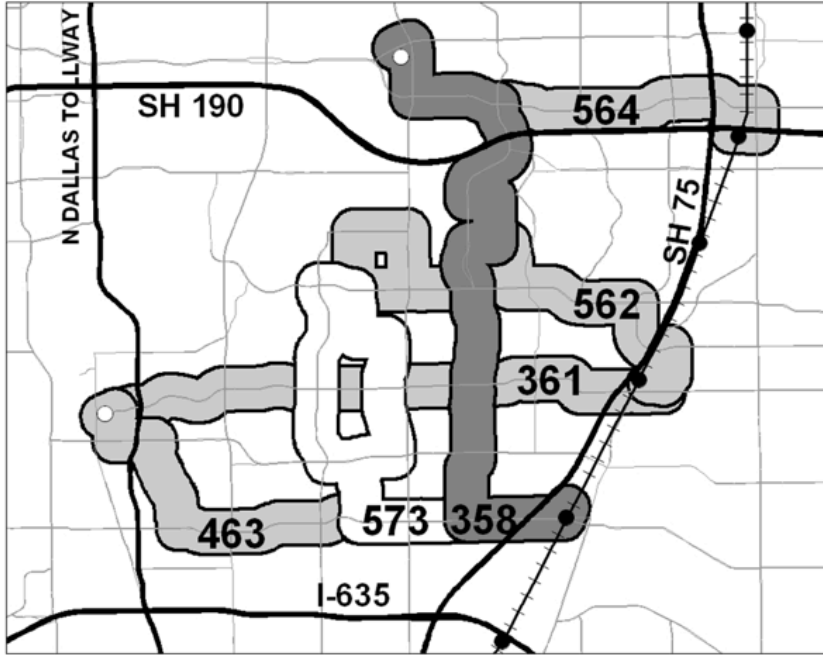
## **Data and Study Area**

The study area for this research is an approximately 100-square-mile section of the Dallas Area Rapid Transit (DART) service area to the north of the city of Dallas in the communities of Richardson and Plano, Texas. We examine in detail six routes, chosen to represent the different types of route that DART manages. These include a dense multifamily corridor route (463); a transit express route (564); a university, multifamily, and commercial route (562); and several mixed multifamily and single-family neighborhood routes (358, 573, and 361) (exhibit 3). All of these routes serve at least one rail station and one transit center with the exception of routes 573 and 562.

Parcel centroids were reclassified as single family, multifamily, residential care facilities, or commercial parcels. Commercial centroids were included in creating the walking network, but they were assigned a zero dwelling count and therefore did not participate in the population allocation or contribute to the summary statistics. Residential care facilities, nursing homes, and group quarters were given a dwelling count of one if they had only a bed count. If they had a dwelling count, they were treated as any other multifamily facility. In the present study the centroids were reclassified and the number of dwelling units transferred using the land use polygon data layer, the development monitoring point file, aerial photography, various reference sources, and occasionally verification with field examinations.

**Exhibit 3**

Study Area Bus Routes



**Results**

The results are summarized in exhibit 4. As expected, both the buffer and network-ratio methods give larger population estimates than the parcel-network method in every case. More specifically, the buffer method always gives the largest estimate for each route. The average increase in estimate when comparing the buffer method with the parcel-network method is nearly 71 percent, although a single outlier affects this increase with an overestimation of 184 percent (this outlier on route 564 will be discussed in detail below). The elimination of this outlier results in an average overestimation of 48 percent.

**Exhibit 4**

Population Estimates

	Route Numbers					
	358	361	463	562	564	573
Buffer method	17,338	16,062	27,203	13,843	4,270	28,006
Overestimation	51%	53%	42%	54%	184%	41%
Network-ratio method	12,762	12,235	23,277	10,075	3,264	22,241
Overestimation	11%	16%	22%	12%	117%	12%
Parcel-network method	11,482	10,507	19,131	8,978	1,505	19,797

Note: All data computed within a 1,320-foot buffer.

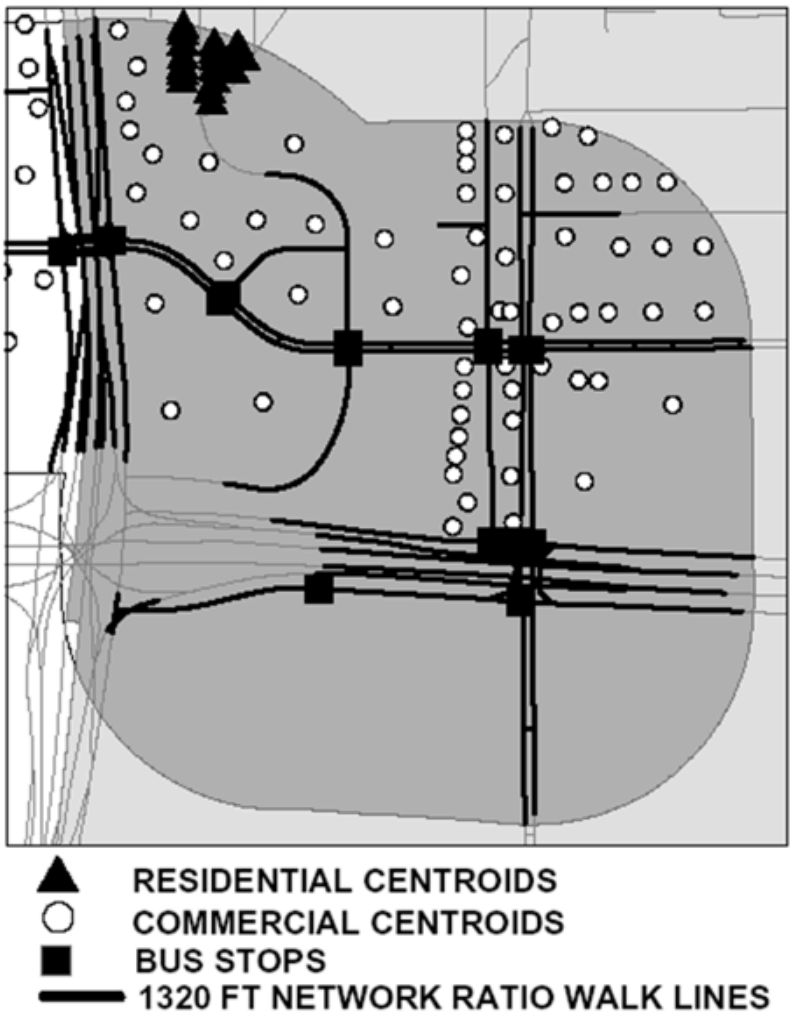
The network-ratio method gives a smaller population estimate but still uniformly results in higher values than the parcel-network method. The average increase in estimate of 32 percent is also affected by the outlier route that influenced the buffer method, and the elimination of this route results in an average increase in estimate of 14.6 percent.

The overestimations given by the traditional methods can be dramatic. To demonstrate this, consider that in the study area being examined here, there are numerous cases where network links are close to transit facilities, but have no associated population (exhibit 5). In particular these network links are highway segments and arterials that are dominated by commercial or industrial land uses. The network-ratio method assigns population to these links even though no such population exists, resulting in an overestimation of the population with transit access.

**Exhibit 5**

Detail of Route 564

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The problem is very apparent for Route 564, shown in detail in exhibit 5. The focus is on a single analysis zone associated with Route 564. The buffer method compares the area within a 0.25-mile buffer with the total area of the analysis zone. This ratio is then applied to the population of that analysis zone. In this case the area within the buffer zone is 16.5 percent of the total area of the census block group. Therefore, the buffer method suggests that 16.5 percent of the population of the block group has access to transit (369 people). Similarly, the network-ratio method compares the length of the streets within walking distance of the route to the total length of streets in the analysis zone. For the case being examined here, 16.8 percent of the streets in the analysis zone are within 0.25-mile walking distance of route 564. This would suggest that 376 people have access to transit.

As shown by the residential parcel centroids (represented with triangles on exhibit 5) the parcel-network method estimates that only a small population (32 people) actually lives within the 0.25-mile buffer in this census block. The other parcel centroids are commercial or industrial with no associated population. Of the 32 people, *none* has access to route 564 within a 0.25-mile walking distance. Therefore, the estimate from the parcel-network method is that *zero* people have walking access to this transit facility. This example highlights the severity of the overestimation that is possible using the buffer and network-ratio methods, and highlights the strength of the parcel-network method to accurately spatially identify the locations of potential transit users.

## **Conclusions and Future Research**

The parcel-network method increases spatial precision because it relies on a discrete rather than a continuous allocation of attributes, unlike both the buffer method and the network-ratio method. The parcel-network method improves even further by allocating population to discrete points (parcel centroids), and no assumptions about population distribution over street length or analysis zone area are made.

The results above demonstrate that the parcel-network method can address well-documented issues in determining the population with access to a transit route; specifically the need to implement disaggregated population data (parcel data), and to model access via walking networks. The method eliminates the demonstrated overestimation that plagued previous methods due to their allocation schemes. By associating aggregate population data with parcel centroid points (rather than with areas or lines), and by creating a walking network that extends from the centroid of each parcel, the parcel-network method provides a degree of spatial precision that had not previously been possible without the use of data collected through survey research. In the future this method could be expanded to explore not only the physical access to transit, but also many other demographic characteristics (car ownership, income, age distribution, and so on) that could influence ridership patterns and therefore route optimality. Once the parcel-network method is implemented for a particular study area, the relative permanence of the parcel and street network data may allow for efficient update when new demographic data become available.

In addition to these improvements, the parcel-network method allows for analysis options that had not previously been available. Not only do we know the distance to the nearest transit facility but we can also generate the exact path that each (cost minimizing) transit user would follow. This path information could be used in several ways to improve transit accessibility. First, it could help

in the study of neighborhood design in order to make improvements in existing pedestrian facilities through sidewalk improvements, elimination of barriers, or adding amenities. Second, the path information could be used to model changes to transit routes that would reduce total (or average) walking distances to the route for a chosen population.

The parcel-network method can also provide a more accurate starting point for application in other transit use models. A dataset prepared using the parcel-network method could be easily applied in transit use models that employ a distance decay formula in the estimation of transit use rather than transit accessibility. Perhaps most importantly, this article highlights the potential for the combination of highly detailed spatial information (in the form of cadastral databases) with network analysis techniques to advance research across GIScience.

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# The Use of Spatially Lagged Explanatory Variables for Modeling Neighborhood Amenities and Mobility in Older Adults

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## Abstract

*As more researchers in the socioeconomic, planning, and health sciences embrace the use of spatial data for exploring the local context of study regions, the demand for alternative (not U.S. Census Bureau) databases is increasing. In particular, information pertaining to local amenities (for example, retail, recreation, and cultural resources) or disamenities (for example, crime and pollution) can provide important details about place. The purpose of this article is to provide a brief overview of a popular alternative data source for capturing local amenities in an urban environment: the Esri Business Analyst. This article also explains and illustrates an approach for incorporating these data into a spatial analysis. We specifically highlight the use of spatially lagged explanatory variables in general linear models. In the spirit of previous contributions to the SpAM series in Cityscape, this article uses data and mirrors methods from a previously published study. In this case, we expand on the work of Rosso et al. (2013) and their recently completed analysis of neighborhood amenities and mobility for older adults in Philadelphia, Pennsylvania.*

## Introduction

A growing body of literature in epidemiological and socioeconomic planning sciences focuses on the assessment of neighborhood influences on health outcomes (Diez Roux, 2007). The literature includes recent works pertaining to obesity (Berke et al., 2007; Booth et al., 2005), assaultive violence (Grubestic et al., 2013; Pridemore and Grubestic, 2012), and risky sexual behavior (Towe et al., 2010), among others. In part, the growth of neighborhood-related research is attributable to the explosion of spatial data and associated analytical methods available to researchers (Moore and Carpenter, 1999). High-resolution spatial data at the block group, block, or even household level greatly enhance public health studies (Gabrysch et al., 2011), improving context and often decreasing spatial uncertainty (Murray et al., 2014) when compared with more aggregate units such as census tracts or ZIP Codes (Grubestic and Matisziw, 2006). Alternative data sources are also gaining favor with many researchers attempting to break out of the traditional box of Census Bureau-based demographic and socioeconomic information. For example, the use of social media data to monitor influenza outbreaks (Corley et al., 2010) or the use of business establishment data to explore trends in broadband provision (Mack, 2014) are two cases in which alternative, somewhat unconventional data are being used to answer important, substantive, policy-related questions.

One area of community health research—the assessment of neighborhood influences on the mobility of older adults—has benefited from the interface of spatial analytical methods, geographic information systems, and alternative data sources (Rosso et al., 2013; Rosso et al., 2011). Although many of the more traditional studies in this domain (for example, Chaudhury et al., 2012; Patterson and Chapman, 2004) rely on census tracts to define neighborhoods, these measures and associated data remain somewhat coarse and fail to account for how the characteristics of proximal neighborhoods and their spatial effects (that is, interaction) may affect outcomes. The inclusion of spatial effects to help account for these complexities is now common in many disciplines, including economics, geography, ecology, and criminology (Florax and Nijkamp, 2003). The spatial effects have not been widely adopted, however, in public health research.

Accounting for spatial effects is often motivated by a combination of theoretical considerations (for example, understanding that neighborhoods are not islands and do not exist in isolation) and/or the peculiarities of the data used for empirical analysis (Anselin, 2002). The process of incorporating spatial effects, however, remains technically challenging for several reasons. First, different spatial models can create distinctly different spatial correlation patterns (Anselin, 2002). Therefore, a relatively deep understanding of how spatial weight matrices need to be constructed is needed for capturing the theorized spatial interaction (Anselin and Rey, 1991; Florax and Rey, 1995). Second, the use of a spatially lagged dependent variable ( $Wy$ ) in regression models is often difficult to implement in public health research because individual study participants are frequently the unit of analysis in epidemiological studies. As a result, it is problematic to capture and model spatial contiguity in the dependent variable unless participants are specifically recruited to provide this contiguity. Third, models that capture spatial dependence often require specialized estimation methods (Anselin, 1988), most of which are not readily available in standard commercial statistical packages such as SPSS, NCSS, or SAS.

Given these challenges (and potential opportunities), the purpose of this article is twofold. First, we detail the utility of the Esri Business Analyst (hereafter, Business Analyst) data (Esri, 2010),

a popular alternative database for the ecological analysis of neighborhoods and their amenities. Second, we explain and illustrate the use of spatially lagged explanatory variables in general linear models, emphasizing their utility for exploring a range of neighborhood-related issues in the epidemiological and socioeconomic planning sciences. In the spirit of previous contributions to the SpAM series in *Cityscape*, this article uses data and mirrors methods from a previously published study. In this case, we expand on the work of Rosso et al. (2013) and their recently completed analysis of neighborhood amenities and mobility for older adults in Philadelphia, Pennsylvania.

## **Capturing Amenity Diversity in Neighborhoods**

Many public health studies rely deeply on U.S. Census Bureau-based data for capturing the local, ecological conditions of neighborhoods (Krieger et al., 1997). Although this reliance on Census Bureau data is shared across many of the socioeconomic and planning sciences, it is important to note that these data are extremely limited in scope when considering the multifaceted composition of neighborhoods. As a result, analysts must use alternative data sources to capture information on neighborhood amenities such as retail establishments, local services, medical providers, and civic and community facilities.

Dun and Bradstreet (D&B) and infoUSA Inc. are two of the most widely available alternative databases for capturing the local ecological composition of neighborhood amenities (Powell et al., 2011), providing millions of data points for local businesses and services in the United States. In particular, the Business Analyst is a popular portal to the infoUSA Inc. data that are supplemented by information from other sources, such as federal and state business registries, local telephone directories, and information from the U.S. Postal Service, to cross-reference and enhance its local amenity data (Esri, 2011). Thus, the use of this supplemental information to create the Business Analyst database may offer an improvement to the raw infoUSA Inc. data. Previous validation work suggests that the Business Analyst includes approximately 51 percent of all business types (Hoehner and Schoutman, 2010), but recent empirical studies on the concordance of the D&B and infoUSA Inc. data, focusing on retail food establishments (for example, food stores and restaurants), suggests that their validity is moderate, at best (Powell et al., 2011). Moreover, Powell et al. (2011) argue that these data should not be used as a substitute for “on-the-ground data collection” (Powell et al., 2011: 1130) unless additional efforts for verification, such as a telephone screening procedure, are made.

It is clear that no database is perfect. Secondary data on local establishments and amenities cannot be expected to reflect the dynamic business and economic environment with 100 percent accuracy, regardless of the supplementary data used for database development. Such environments have far too many changes to capture on a daily, weekly, and monthly basis. As a result, partial coverage and a lack of complete concordance are known limitations to these data. It can also be argued that these data remain valuable, however, even if they provide only a relatively conservative estimate of neighborhood amenities.

In a recent study of amenity diversity and its connections to mobility in older adults in the city of Philadelphia, Rosso et al. (2013) used the Business Analyst database to obtain a local ecological snapshot of multiple neighborhoods. Rosso et al. (2013) specifically leveraged the “diverse uses” criterion from the Leadership in Energy and Environmental Design Neighborhood Development

(LEED-ND) to define amenity diversity (USGBC, 2009), where the occurrence of any particular amenity type (up to two occurrences) was counted for each neighborhood.<sup>1</sup> These counts were then summed for each neighborhood across the 27 unique types of amenities used for analysis, which ranged from pharmacies to hardware stores and other retail and from medical clinics to post offices and public libraries.<sup>2</sup> The resulting scale of amenity diversity ranged from 0 to 54 and had a Cronbach’s alpha value of 0.79, suggesting adequate consistency across multiple neighborhoods in Philadelphia.

This type of approach works for several reasons for neighborhood-level ecological analyses. First, the measure is structured to capture amenity diversity—nothing more, nothing less. It is not structured to provide a complete audit of establishments or amenities within a neighborhood. Second, because the measure focuses on amenity diversity, the use of a conservative database of establishments is actually beneficial for the resulting index. In effect, the lack of inflation in the Business Analyst suggests that when amenities are found, the likelihood of more existing in the neighborhood is high, even if they are unaccounted for in the database. Of course, the inverse is also true—where less common amenities remain obscured by the existing database—but these can be mitigated with alternative data sources as well. For example, Rosso et al. (2013) captured famers’ market locations from an approved list of operations maintained by the city government of Philadelphia. Official city parks were captured in a similar way. In the end, analysts must structure their measures to reflect known uncertainties or limitations in the data—a process no different than using data from Census Bureau-based sources like the American Community Survey (Citro and Kalton, 2007).

## Spatially Lagged Explanatory Variables

A second facet of the Rosso et al. (2013) work that provides some flexibility in capturing neighborhood interaction and enhancing the statistical legibility of the connections between the mobility of older adults and local amenities is the use of spatially lagged explanatory variables for use in generalized estimating equations (GEEs). GEEs are semiparametric regression techniques used to estimate parameters of a generalized linear model when the correlation between outcomes is unknown (Hardin, 2005). GEEs are popular for public health studies in which cohorts are distributed across multiple study areas (for example, neighborhoods) because GEEs are good at handling unmeasured dependence between outcomes (Lin et al., 1998). Spatially lagged explanatory variables ( $Wx$ ) are used to capture the weighted sum of values for neighborhood  $i$  by using its local neighbors as weights. Specifically,

$$[Wx]_i = \sum_{j \neq i} w_{ij} x_j, \tag{1}$$

where the influence or weight of each link  $i - j$  is expressed in the weight matrix. As detailed by Anselin (2002; 1988), these weights are often based on the geographic contiguity for each  $j$ , relative to the location of  $i$ , but the weights can easily be expressed via alternative conceptualizations

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<sup>1</sup> In this study, census tracts were used as surrogates for neighborhoods in Philadelphia.

<sup>2</sup> For a complete list of amenities, see the original paper (Rosso et al., 2013).

such as  $k$  nearest neighbor or with distance-based matrices. Florax and Rey (1995) and Anselin and Rey (1991) provide some guidance on the proper specification of these weights matrices and also on errors attributable to a poor specification.

Spatially lagged explanatory variables are important tools to use for regression modeling, broadly defined. In fact, their potential use as cross-regressive terms stands in sharp contrast to the more widely used form of spatial regression modeling, where the dependent variable is lagged. Although space limitations prevent us from detailing the nuances of spatial reaction functions and their theoretical basis for dealing with spatial autocorrelation in linear regression models, readers are referred to Brueckner (2002) for more detail. In short, rather than creating a multiplier effect as with spatially lagged dependent variables, spatial cross-regressive terms can be used directly in a standard regression framework. With spatially lagged explanatory variables, variables can be spatially lagged, or not, depending on model context:

$$y = X\beta + WX\gamma + \varepsilon. \quad (2)$$

The range of the spatial cross-regressive terms spans from the very local, where only a few neighbors are included, to the global, where all neighbors (for all  $i$ ) are included. This range is directly contingent upon the number of zero-restrictions ( $w_{ij} = 0$ ) imposed for a study region or neighborhood (Anselin, 2002). Further, it is important to note that, unlike the more common spatially lagged regression models in which simultaneity makes the  $Wy$  variables endogenous, the spatial cross-regressive framework does not require any specialized estimation techniques. In other words, even ordinary least squares regressions would work with these data and not bias  $\gamma$  (Anselin, 2002).

Rosso et al. (2013) used a spatially lagged explanatory variable in a slightly different way for their analysis of neighborhood amenity diversity and adult mobility in Philadelphia. The lagged variable of amenity scores, which was defined with a queen's contiguity matrix, was specifically used as an interaction term for the GEEs. Interaction terms are often used in epidemiologic analyses to determine whether the association between an explanatory factor and the dependent variable is moderated by a third variable. Consider the following:

$$y = X_1 \beta_1 + X_2 \beta_2 + X_1 X_2 \beta_3 + \varepsilon, \quad (3)$$

where  $\beta_3$  specifies the magnitude of the interaction. Rosso et al. (2013) used this interaction term to capture how amenity diversity for each tertile of the index census tract was moderated by amenity diversity of the surrounding census tracts.<sup>3</sup> This approach allowed for an objective assessment of whether the observed associations were specific to the characteristics of a participant's home census tract or were influenced by the characteristics of surrounding census tracts. Again, an advantage of this method is that it can be implemented in standard statistical packages.

Several GEE models with and without the spatially lagged explanatory variables and their associated interaction terms ultimately were compared by minimization of the penalized quasi-information criteria (QICu), which accounts for the number of parameters in the model (De Knegt et al., 2010).

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<sup>3</sup> The LEED-ND guidelines provide cutoffs to define levels of diverse use. The Rosso et al. (2013) study divided these cutoffs into tertiles for analysis.

In analyses adjusted for individual- and neighborhood-level covariates, no association was observed between tertile of amenity diversity and mobility (that is, mean difference in mobility;<sup>4</sup> for example, when compared with the lowest tertile: mean difference in mobility at the middle tertile = -2.2, 95% CI: -6.5, 2.2 and the highest tertile = 3.2, 95% CI: -1.5, 7.9). When analyses were restricted to those individuals who reported the most time spent in their home neighborhood (see Rosso et al., 2013 for details), a significant association was observed for those living in census tracts in the highest tertile of amenity diversity compared with those in the lowest tertile (mean difference = 8.3; 95% CI: 0.1, 16.6) with approximately equal mobility for those in the middle compared with the lowest tertile (mean difference = -1.7 for middle; 95% CI: -10.0, 6.6).

Finally, no significant interactions were reported between tertile of amenity diversity at the index census tract and the spatially lagged explanatory variable (all  $p > 0.2$ ). Inclusion of interaction terms also did not improve model fit.<sup>5</sup> Similar results were observed for analyses restricted to those individuals who spent the most time in their neighborhoods. These results indicate that the associations between mobility and the observed amenity diversity of a participant's home census tract were not greatly influenced by the amenity characteristics of neighboring census tracts. In part, the lack of influence from neighboring tracts may be explained by the moderate amount of concordance between amenity diversity at the index tract and the spatially lagged estimate of amenity diversity for neighboring tracts (44 percent of tracts were in the same tertile of amenity diversity as their spatially lagged counterpart; kappa = 0.2). Alternatively, this lack of influence may suggest that at least for associations between amenity diversity and mobility of older adults, measures at the participant's own census tract are sufficient to capture relevant neighborhood characteristics.

## Discussion and Conclusion

Several points are worth further discussion. First, alternative data sources, such as the Business Analyst database, are useful sources of information to augment Census Bureau-based data. Although the data are not perfect, analysts who understand the limitations and take steps to mitigate known uncertainties will find these types of alternative datasets can provide more detail and depth for exploring neighborhoods and their ecological context. Second, the use of spatially lagged explanatory variables enables analysts to consider spatial effects between neighborhoods in a meaningful way. More important, this method can be accomplished without the use of specialized estimation techniques, making spatially lagged explanatory variables more readily integrated into many public health studies than other spatial regression techniques. The choice of spatial weights for developing these explanatory variables remains important, and analysts should take time to conduct some basic sensitivity analysis for evaluating which weights matrix best captures the theorized interaction.

Finally, where the Rosso et al. (2013) application is concerned, one limitation of using spatially lagged explanatory variables as interaction terms is that the model requires a sufficient sample size to detect interactions (Greenland, 1983). To be specific, because interaction relies on dividing

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<sup>4</sup> Mobility was assessed by the Life-Space Assessment (Peel et al., 2005), which uses a scale of 0 to 104 points. Higher scores indicate higher mobility.

<sup>5</sup> QICu without interaction terms = 488, with interaction terms = 494; smaller QICu indicates better fit.

the study population into smaller subgroups, statistical power is lost. For many large-scale public health or socioeconomic and planning studies, this loss of statistical power may not be an issue. Statistical power must be considered on a case-by-case basis, however, by reviewing the distribution of study subjects within the various levels of the modifying variable (for example, tertiles). Note that interpretation of interaction terms can be difficult if the modifying variable is continuous.

In sum, the growing availability of alternative data sources, combined with the power of geographic information systems and associated analytical methods, provides a powerful foundation for advanced geographic reasoning at a highly localized level. Although the connection between neighborhood amenities and adult mobility is just one application, many more substantive domains exist where this fusion of data and methods, including the development of spatially lagged explanatory variables, would be useful. It is important to reiterate that care must be taken to understand the limitations of both the data and techniques being used for analysis, as uncertainties will remain. When applied rigorously, however, many opportunities arise to improve the efficacy of public policy and public health interventions with these methods.

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*Call for Papers*

# Symposium on Deceptive Practices in Consumer Financial Services

The U.S. Department of Housing and Urban Development, Office of Policy Development and Research invites paper (article) submissions for a symposium in a future issue of *Cityscape* on topics that relate to deceptive practices in the provision of traditional and alternative consumer financial services. Topics might include (but are not limited to)—

- Deceptive mortgage-related practices, including those practices related to underwriting processes, appraisal, servicing, and the foreclosure process.
- Deceptive practices involved in the operation of alternative financial services, such as check-cashing outlets, payday lending, and automobile title lending.
- Other types of financial services that strip households of their wealth.
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We encourage the authors to submit articles that consider these activities within classical economic, geographic, and urban planning frameworks and within interdisciplinary frameworks. Submission proposals may be theoretical or empirical but must be original work. We strongly encourage articles that address policy implications.

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