Does Urban Design Influence Property Values in High-Poverty Urban Neighborhoods?

Brent D. Ryan and Rachel Weber

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Abstract

The nationwide real estate boom of the 1990s brought new housing development to many formerly distressed urban neighborhoods. Our study investigates the relationship between the urban design and the value of new housing in order to determine whether or not urban design is a significant contributor to housing value in these places. We distinguish between three urban design types (enclave, traditional neighborhood development [TND], and infill) and perform a hedonic regression on the assessed values of development constructed in distressed Chicago neighborhoods between 1993 and 2003. Our findings demonstrate that urban design is a significant contributor to value. Infill-type housing is the most highly valued, and there are clear penalties for enclave- and TND-type housing. We conclude that residents of new urban housing value its close connection to its surrounding neighborhood context, and do not prefer housing dissociated or isolated from its context. We also examine the value contributions of individual urban design features and find that residents value some urban design features characteristic of enclave-type and others characteristic of TND-type development.

About the Authors

Brent D. Ryan is Co-Director of the City Design Center at the University of Illinois at Chicago, where he also Assistant Professor of Urban Planning and Policy. His area of expertise is in the urban design and planning of distressed neighborhoods. His first book, *The Suburbanization of the Inner City: urban housing and pastoral ideal* (in preparation), examines the influence of suburban architecture and neighborhood design on new inner-city housing in Philadelphia and Detroit. He has worked as an urban designer for the New York City Department of City Planning and as a community planner in Boston. He received his master's degree in Architecture from Columbia University and his doctorate in Urban Design and Planning from the Massachusetts Institute of Technology.

Rachel Weber is an Associate Professor in the Urban Planning and Policy Program at the University of Illinois at Chicago. Dr. Weber is the author of numerous articles and reports in the fields of development finance and industrial restructuring. Her book, *Swords into Dow Shares: Governing the Decline of the Military-Industrial Complex* (2000), examined the role of financial markets in the defense drawdown of the early 1990s. Her current area of expertise is in evaluating the design and effectiveness of financial incentives for economic development, particularly the municipal use of Tax Increment Financing (TIF). She received her master's degree and doctorate in City and Regional Planning from Cornell University and bachelor's degree from Brown University.

Contact information:
City Design Center
820 West Jackson Boulevard, Suite 330
University of Illinois at Chicago
Chicago, IL 60607
(312) 996-6097
Email:
bdr@uic.edu
rachelw@uic.edu

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Introduction

The housing construction boom of the 1990s was experienced in some of the poorest urban neighborhoods of the United States. In cities such as Chicago, Detroit, and St. Louis, new public and private funds were invested in areas whose housing stock had been essentially unchanged and unimproved since it was originally constructed. While attention has been paid to public housing and the small-scale efforts of community development corporations in these low-income neighborhoods, little is known about the nature of private development efforts there. Attracted by vacant land and new markets with access to cheap credit, for-profit developers built a variety of housing developments, ranging from large, multifamily apartment buildings to gated communities of owner-occupied single family homes, during this decade. The design of this new housing varies widely: in some cases it respects its urban context, aspiring to what has been called "neo-traditional" standards, while in others, it is spatially isolated from the pre-existing housing stock.

Policy makers point to any and all examples of market-driven development as evidence of the revitalization of poor neighborhoods. But it is likely that the different kinds of development being constructed will have different impacts – both in terms of the households attracted to them and their impact on surrounding properties. This is because developments will vary in terms of the (dis)amenities they offer, their total development costs, and the degree to which their construction signals a change in the fortunes of the neighborhood.

Examining how residents themselves value the different urban design aspects of their housing will help us to determine the magnitude of these differences. Assuming that such preferences are revealed in the prices potential purchasers and renters are willing to pay for different kinds of housing (and therefore the value at which they are assessed for taxation purposes), we are interested in exploring the relationship between urban design types and housing values. The relationship between urban design and housing values is particularly important for revitalizing low-income neighborhoods, but those researchers who have begun to examine the design-value relationship have, for the most part, concentrated on suburban areas (see, for example, Eppli and Tu 1999). Suburban housing development is characterized by large, contiguous clusters of housing built on previously undeveloped land. These developments are generally not closely integrated into an existing context, unlike distressed urban neighborhoods, where existing housing is often no more than a few feet away from new development.

This absence is unfortunate given the fact that knowledge about how residents value housing will have serious implications for the future viability of urban neighborhoods experiencing nascent for-profit development activity. New products may initially challenge the norms and professional practices of those actors who shape real estate market practices, such as realtors and tax assessors, because of the absence of well-

developed markets and comparable sales. If local governments wish to enhance value creation in the inner city, our results indicate that they too will need to pay attention to the design of larger-scale construction projects and make efforts to encourage those housing design types that residents most prefer.

The Resurgence of Inner City Development: What Is Being Built, Where, and Why?

The resurgence of privately-financed development in distressed, inner-city neighborhoods has resulted in substantial change to the urban landscape of these places during the past decade. Many such neighborhoods have been transformed by the addition of large numbers of new housing units to the landscape. In Detroit, for example, almost no privately-financed housing was constructed in the city in the 1980s. In contrast, the last fifteen years has witnessed the construction of over 40 projects, with a total number of new housing units numbering almost 4,000 in that city (Ryan 2006). The growth of new privately-financed housing in distressed neighborhoods nationwide reflects the socioeconomic transformation of these neighborhoods, beginning in the early 1990s, into more diverse areas through the influx of higher-income residents (e.g., gentrification) as well as through the rising income levels of existing residents (Wyly and Hammel 1999, Jargowsky 2003).

Urban design plays an important role in low-income, distressed urban neighborhoods for three related reasons. First, the large amounts of vacant land and unoccupied parcels in these neighborhoods permit substantially more urban design decisions than in those urban neighborhoods with little vacant land. Developers working in low-income neighborhoods can often make urban design decisions such as aggregating city blocks, reshaping street patterns, and creating extensive new areas of open space (Ryan 2006). Since the potential influence of urban design on distressed neighborhoods is greater, it is important that this urban design contribute to, rather than diminish, the viability of these neighborhoods.

Second, policy makers have long argued that urban design is a principal determinant of not only physical but economic and social integration in those public housing complexes across the United States whose redevelopment has been guided by the Federal HOPE VI (Housing Opportunities for People Everywhere) program (United States Department of Housing and Development 2000). The physical characteristics of HOPE VI have been influenced by New Urbanist theory, which makes the same integrationist argument more broadly for all types of communities (Duany et. al. 2000). If urban design is an important contributor to economic and social integration, it can be argued that urban design is a particularly important component of development in low-income distressed neighborhoods, whose residents have been historically characterized by high levels of social isolation and lack of economic opportunity (Wilson 1996).

Third, increasing housing values is particularly important in distressed neighborhoods, which are generally characterized by market failures and depressed property values. Attracting private development depends on the ability of developers to generate their expected profit levels. Although rapid spikes in value have the potential to destabilize

the area, planning and development officials in cities across the United States have recognized the importance of increasing the level of market activity in such neighborhoods and are therefore actively promoting policies that seek to diversify the range of housing types and income groups there (Grogan and Proscio 2000).

New housing in distressed neighborhoods does not follow identical or homogenous urban design principles. Previous studies of distressed neighborhoods in Detroit and Philadelphia (Ryan 2002, 2006), Pittsburgh (Deitrick and Ellis 2004), and preliminary observations of distressed neighborhoods in Chicago indicate that new housing development follows one of three urban design models. These models are: 1) infill, or scattered-site development; 2) traditional neighborhood, or neotraditional, development; and 3) enclave, or self-contained development. Each of these urban design models is explained briefly below, and some broad characteristics of these models are provided in Table 1.

Table 1. General characteristics of different urban design types

Development type	Parcel size	Number of developers per unit of land area	Number of urban design decisions possible	Physical integration with context
Infill	Small	Many	Few	High
Traditional Neighborhood Development (TND)	Large	Few	Many	Moderate
Enclave	Large	Few	Many	Low

Infill or scattered-site-type development occurs in neighborhoods where individual or small groups of parcels are available for redevelopment on existing city blocks. Many distressed neighborhoods have lost housing in an *ad hoc* fashion to deterioration, arson, and demolition, and their city blocks therefore contain remaining historic housing interspersed with vacant parcels. These parcels are available for infill-type development. Other revitalizing neighborhoods have existing housing that is under-built under existing zoning or is in poor condition. This housing can be demolished in a piecemeal manner and be replaced by infill-type development. Infill housing does not result in substantial changes to the structure or arrangement of city blocks because the large numbers of existing housing preclude substantial changes to existing street, alleyway, and lot subdivision patterns.

Traditional neighborhood and enclave-type housing development can occur in distressed neighborhoods where large empty groupings of parcels or city blocks are available. These parcels may be available because large industrial facilities have been cleared, or because decline and demolition has removed most or all existing housing. These parcels are sufficiently large to permit the construction of large numbers of contiguous new housing. This large parcel size also requires urban design decisions such as the location and disposition of housing, open space, roadways and parking areas. The number of urban

design decisions possible on larger parcels is in contrast to smaller, scattered-site parcels, where most of these decisions have been predetermined by the existing context.

The urban design decisions required for large-parcel developments determine the degree to which these developments connect to or isolate themselves from their surrounding context. Developments following the neo-traditional, or traditional neighborhood development (TND), urban design model attempt to refer to, connect to, and integrate the new development with their surroundings. TND housing replicates certain traditional neighborhood features, particularly street-facing housing and interconnected street grids, even while it may provide other features not characteristic of older neighborhood housing, such as attached garages.

In contrast, developments following the enclave urban design model not only do not attempt to relate to their surroundings, but consciously reject them by spatially isolating the new housing from their surroundings through the orientation of buildings, roadways, and construction of barriers or spaces between new buildings and surrounding streets and buildings. In effect, these developments act as islands isolated and segregated from their surrounding context. Bohl refers to developments following this urban design approach as "inward-focused residential pods" (2000, 767).

Both the TND and enclave urban design models can be situated with respect to the architectural and planning movement known as the New Urbanism (Morrow-Jones, Irwin and Roe 2004; Bothwell, Gindroz and Lang, 1999; Talen 2001). New Urbanism is an architectural and urban planning movement that advocates the design of new development along traditional lines to achieve, among other goals, spatial connectivity between different aspects of the built, social, and economic environment (Langdon, 1994). Examples include connections such as those between housing and the workplace; between residents and jobs; between different street networks and neighborhoods; between individuals and civic responsibilities; and between different economic and social groups. As a movement organized around spatial principles, New Urbanism operates at different scales, from metropolitan regions to "neighborhood, district, and corridor" to "block, street and building" (Leccese and McCormick, 2000).

Although many New Urbanist developments have been constructed in greenfield, suburban environments, the application of New Urbanism to the redevelopment of inner-city neighborhoods has also been advocated (Bohl 2000). New Urbanism has had a particular impact on the redesign of distressed public housing through the HOPE VI program (HUD 2000), but other inner-city housing developments have also followed New Urbanist design strategies, even if they are not explicitly labeled as such (Deitrick and Ellis 2004, 440.)

Although the existing built context of distressed urban neighborhoods is diverse, ranging from dense multifamily buildings to detached single-family homes, New Urbanist-inspired redevelopments of many inner-city neighborhoods have followed consistent architectural and urban design features. Bohl (2000, 781), characterizes some of these approaches as "narrow streets, continuous sidewalks, street trees, shallow setbacks, urban

public spaces, (and) mixed housing types and land uses." These features are generally characteristic of many older moderate-density urban neighborhoods across the United States, although historic housing densities in these older neighborhoods may vary significantly (Ryan 2006). Just as New Urbanism can operate at different scales within the metropolitan region, New Urbanist principles can be applied at different scales in distressed neighborhoods. Deitrick and Ellis (2004, 430) characterize three of these scales, ranging from large to small, as community refill, neighborhood infill, and scattered-site infill.

While the application of New Urbanism to inner-city redevelopments is being increasingly explored in both practice and theory, the direct impact of the movement on distressed neighborhoods is still up for debate. Many inner-city housing developments unassociated with HOPE VI have been influenced by New Urbanism (Steuteville 1999, Deitrick and Ellis 2004), indicating that the movement has become more legitimate among housing developers. At the same time, many housing developments being constructed in distressed neighborhoods do not follow New Urbanist design principles. Our research in Chicago showed that approximately 40 percent of contiguous large (i.e. non-infill) developments were enclave- rather than TND-type developments. This indicates that both suburban and New Urbanist approaches continue to be seen as valid urban design strategies for new housing development in distressed neighborhoods, at least in Chicago.

Why Would We Expect a Value Differential between Different Urban Design Types?

Urban economists assume that different attributes of property affect its price in ways that can be statistically observed. This, in fact, is the basic premise behind hedonic modeling. Analysts have empirically demonstrated how characteristics of the property's structure, location, and socio-economic environment are capitalized into prices. Economists, however, are typically less sensitive to other aspects of the built environment that may also have significant price effects. Most analyses of price effects use data that is highly aggregated spatially, and even those studies that rely on disaggregated micro-data (where the building or unit is the unit of analysis) have no way of accounting for the design or spatial configuration of the housing.

There are three primary reasons why design might influence price, particularly in depressed markets: variation in construction costs, amenities, and the ability of projects to mitigate the uncertainties associated with future development. We discuss each in turn.

Development Costs

Although architectural quality may not be higher for any one of the three urban design types, each of these types use space in a different manner and therefore may be, on average, more or less costly to build on a per square foot or per unit basis. Different development costs, depending on the competitiveness of individual housing markets, can then be translated into differential sales prices and values for new homes. Given that

labor and materials for new construction do not vary tremendously at the low end of the value scale, the primary cause of variation will be associated with transaction costs and the scale of building.

Enclaves and TND models are likely to have a cost advantage over developments built as infill. This advantage stems from the fact that larger developments can take advantage of economies of scale in building materials, labor, and land. Although housing in these developments may be constructed in phases, land is usually acquired at one point in time. The relative predictability of the development product allows developers to budget and negotiate reductions in per unit costs with building contractors. Moreover, larger developments generally feature a relatively uniform housing product, which allows the developer to realize an economy of scale associated with mass production (Gyourko and Rybczynski 2001). Investors may be more likely to make capital available on favorable terms to developers of larger-scale, more uniform projects although, because infill development can be undertaken on a parcel-by-parcel basis, smaller increments of capital can be used to finance this development type.

Depending on the availability of large lots or contiguous parcels, enclaves and TNDs may have a greater potential to minimize transaction costs as the larger lots conducive to such projects reduce the amount of permitting and legal costs associated with buying and selling property. In poor neighborhoods, many large vacant or underutilized parcels of land exist. In some cases, these parcels are available because they were occupied by industrial uses which have been demolished (Weber and Pagano 2002). In other cases, particularly in severely distressed neighborhoods, large tracts of open land are available where large numbers of housing structures were abandoned and demolished over a period of years or decades (Ryan 2006). Formerly industrial lots may have a greater probability of environmental contamination but barring any serious remediation are likely to be less expensive than the equivalent size comprised of smaller lots (Munneke 1996). In contrast, infill development occurs on individual, smaller lots, each of which needs to be individually transacted. Land assembly is more difficult in cases where each parcel is separately owned, and assembling large, contiguous parcels may be extremely difficult because of the existence of intervening, inhabited housing whose owners may be unwilling to sell.

Although enclaves and TNDs are both likely to share some cost advantages over infill-type developments, these urban design types can, in some instances, be more expensive to build than infill. Since enclaves are isolated from their context and often require additional roadways, landscaping, and parking areas, structures may cover less of their parcel area and may be constructed at lower net unit densities than infill and TNDs, thus necessitating a higher construction cost per unit. TNDs may also require interior roadways, parking area, and landscaping, adding to development costs. This cost disadvantage, however, may be less applicable in distressed neighborhoods, where land costs may be cheap and/or heavily subsidized.

Amenities

Housing demand is affected by the presence of amenities and disamenities. An amenity is a spatially heterogeneous quality that is not critical to the use of property but affects the willingness of potential purchasers to pay for nearby housing. The (dis)amenity value of everything from better views to proximity to land fills and open space has been measured. Household utility is affected by both exogenous environmental amenities (e.g. river views) that are out of the control of developers and also by endogenous development amenities (e.g., density, urban design) that may be influenced by developers.

In this study, we are particularly interested in amenities that have not been previously considered amenities as such, particularly the degree to which housing design facilitates social interaction, provides residents with a sense of security, and builds confidence in the neighborhood's social and economic future. Such amenities may be proxied by different elements of a development's structure, location, and design context that are correlated with design type and may be reflected in a housing value differential. We hypothesize that there are three types of amenities that play a role in value differentials: site design, locational, and social interaction amenities.

Firstly, enclave and TND-type developments involve the wholesale transformation of a local environment. Therefore, these developments may provide additional site amenities such as new infrastructure (e.g., roads and sidewalks) and landscaping, for which future residents are willing to pay. Enclaves are also more likely to provide desirable off-street parking in a convenient location, i.e. in front of or immediately adjacent to the primary entrance of a house. In contrast, infill housing typically has individual alley garages or relies entirely upon on-street parking, the latter of which is often defined by its scarcity. On-street parking may offer a lower standard of safety for parked automobiles because of heavier traffic and crime.[1]

Secondly, correlations between design type and locational (dis)amenities may also lead to value differentials. For example, the need for larger parcels of developable land may push enclave and TND developments further away from more densely developed areas near public transit stations and commercial hubs. Some residents, particularly those who own their own cars, may consider relative isolation from these hubs a virtue, or might at least not consider it as much of a disadvantage as a transit-dependent buyer. For the more transit-dependent, however, a location near a retail corridor may lead them to prefer smaller infill-type developments more common in such areas.

Thirdly, physical design contributes to the amount and quality of possible social interactions. Housing isolated from its surroundings by open space, plantings, parking, or even fences and gates reduces the ability of residents of that housing to interact with their

[1] On-street parking may also reduce the appeal of nearby developments by congesting streets and reducing the "aesthetic appeal of the neighborhood" (Guttery 2002, 266; see also Bohl 2000). Other scholars disagree, citing narrow streets with on-street parking and slower traffic as a positive contributor to perceptions of resident comfort and safety (Appleyard 1966).

surroundings and interferes with their ability to access the neighborhood on foot. Social interactions, in turn, influence the degree of participation of residents in the civic life of their neighborhood (Jacobs 1962; Whyte 1990; Duany et. al. 2000, Bothwell, Gindroz, and Lang 1998). All of these authors point to the importance of striking a balance between seamless integration with the existing urban context and the preservation of one's private sphere of control. On one hand, integration implies an expansion of opportunities for community building and social support. On the other hand, too much openness can lead to a loss of individual identity and self-interest in the upkeep of communal space (i.e., a tragedy of the commons).

Most scholars agree that existing urban neighborhoods, or those designed as TNDs, provide for more social interaction than other approaches, particularly urban designs where buildings are spatially isolated from and do not directly address their context. Two empirical studies have found that TNDs positively influence housing prices. Eppli and Tu (1998) found that New Urbanist-style developments, along the lines of TND, were able to command higher prices than similar units built in a traditional postwar developments. Song and Knaap (2002) confirmed that residents are willing to pay more for some New Urbanist features, such as internal connectivity, but are less willing to pay for projects that are more integrated with the surrounding environment.

The degree of integration has implications for perceptions of security (Newman 1972). For the most part, low-income neighborhoods are also considered high-crime areas. As such, many residents may feel the need to protect themselves from surroundings that they perceive as dangerous and even hostile. Even though Blakely and Snyder (1997) found that 'gates and barricades' had no significant effect on crime, such devices are intended to provide the illusion of protection. Enclave housing, isolated from its surroundings by plantings, roadways, fences and gates, may contribute to this sense of safety. Enclaves, even if they do not literally isolate themselves from their surroundings with fences and gates, communicate their distinctiveness, isolation, and protectedness by spatially emphasizing their differences from nearby housing.

The spatial integration of new housing with its surroundings is important for an additional reason. Housing that is typologically and spatially distinct from its surroundings may stigmatize residents, particularly if they are low-income. Thus, HOPE VI redevelopments have emphasized the "contextual" nature of this new housing to reduce the distinction between public housing developments and its surroundings, even if the housing's design appeals more to an imagined sense of what is typical of the neighborhood rather than the reality. However, one can also hypothesize that high-income residents locating in a primarily low-income area might want their new housing to be strongly distinguished from its surroundings for image reasons.

In contrast, infill housing is constructed on existing lots within an existing urban neighborhood structure, in between existing housing units. Although infill housing may provide a fence and gates for individual housing, it is unable to spatially isolate or otherwise distinguish itself from its context in the way that enclaves, and to a certain extent TNDs, do. This openness may provide unwanted access to strangers and fewer

opportunities for the regulation of risk, but such problems may be offset by improved community social controls if residents know each other well (Bothwell, Gindroz and Lang 1998; Song and Knaap 2002).

Future Uncertainties

Land development, especially in poor neighborhoods, can be thought of as a process of inherent uncertainty tied to neighborhood effects. As such, early residents face disadvantages due to the fact that "(they) simply do not know with certainty how the neighborhood development will evolve or proceed over time" (Sirmans, Turnbull, Dombrow 1997, 615). Prior research has also shown how exogenous changes to the "physical demographic characteristics of a neighborhood" may change expectations about the future of the community and influence individual mobility decisions and investments in upkeep (Galster 1987). Individuals are more likely to invest in maintaining their homes and buy more expensive homes when they see new development taking place or are assured that it is imminent.

Taken together, these lines of argument suggest that different urban design types have different potential to mitigate some of the uncertainties associated with future development. This is primarily the result of their differing capacities for providing endogenous site amenities and effecting large-scale neighborhood transformation. Enclaves and TND developments, for example, provide assurance to purchasers that additional units will be built and that they will be similar in nature to the units purchased early on. Unlike infill developments, these urban design models offer the amenity of a "complete environment", where all aspects of the development are under the control of a central developer or property association. The separation, distinctiveness, and isolation of these urban design types may provide a guarantee against uncertainty. Ellen et al. (2001) indeed found that larger scale had significantly larger effects on values in the surrounding areas and that big, dense projects had more of an effect. As such, one can argue that the scale, homogeneity, and planned nature of the enclave and TND models help to internalize some of the negative externalities of future development. In contrast, the purchaser of a small infill building has no such guarantee of what will happen in her immediate vicinity and is at a disadvantage due to her lack of information about the nature of future development.

Prior research has determined that residents may be willing to pay a premium for such assurances. Peiser (1984) found that there were slightly higher net benefits to planned versus unplanned growth when he examined land development, transportation, and social costs. Planned developments have the potential for governance structures that regulate future risk and price effects, and therefore residents may be willing to pay a premium for such guarantors of predictability as restrictive covenants (see Speyer 1989; Hughes and Turnbull 1996). Alexandrakis and Berry (1994) found a premium for homes in master planned communities during economic upswings, but during downswings the premiums approximated the cost of providing additional amenities in such communities. The

literature is thus inconclusive as to whether or not developments that mitigate future uncertainties contribute to values.

In conclusion, existing theory does not allow us to make strong *a priori* hypotheses about whether infill, TND, or enclave urban design types will be more preferable and therefore more highly valued. While infill housing may be more expensive to build, potential residents may prefer to pay more for the additional sense of security associated with living in the more isolated and planned environments of enclaves. While potential residents may prefer to live in housing that is more integrated with the urban fabric (infill or TND), they may also be willing to pay more to live in an enclave and feel as if they have control over future uncertainties. If we control for other aspects of the housing that will make it more and less attractive to a particular market, hedonic modeling will reveal the preferences of residents as they relate to the urban design-related characteristics of new housing.

Model

For years, scholars have speculated about the existence of a strong relationship between physical structure and residents' well-being (Jacobs 1961; Newman 1972), but few have tested this relationship empirically (with the exception of Eppli and Tu 1999, Song and Knaap 2002, and Morrow-Jones, Irwin, and Roe 2004). We take up this challenge by employing a standard hedonic model whereby critical urban design features are regressed on the assessed values for new construction in low-income areas. Such a model allows multiple attributes of the housing and its location to simultaneously influence its value so that the effect of specific attributes can be isolated.

We adopt the following semi-log functional form because of the possibility of a non-linear relationship between assessed value and key attributes (e.g., parcel size):

$$\text{Ln(Assessed value)} = \alpha + \beta X + \delta Z + \gamma \text{Scale} + \lambda \text{Enclave} + \varphi \text{TND} + \varepsilon$$

In the equation above, the dependent variable is the log of a parcel's assessed value in 2003 while X represents a vector of structural characteristics, Z represents neighborhood attributes, and Scale represents the size of the associated development cluster. In this equation, α is the intercept, and ε represents an error term. The binary variables of Enclave and TND both take on values of 1 if the parcel is located in an enclave cluster or TND cluster and take on a value of 0 otherwise. These two dummy variables are mutually exclusive, and we compare them to a control group of new construction infill development (i.e., not part of a planned, contiguous development). We describe our categorization process in more depth in the following section. We test the hypothesis that design context has price effects, i.e., similar housing in enclaves, TND, and infill development is differently valued.

Data and Variable Descriptions

We assembled data on parcels (i.e., land and building) of housing constructed between January 1, 1993 and December 31, 2001 from construction permits supplied by the City of Chicago Department of Buildings (DOB). As we have explained, the policy motivation for our work required that we focus only on new developments in distressed neighborhoods. It has been demonstrated that housing markets are segmented and that different segments of the housing market operate according to different logics (Goodman and Thibodeau 2003). As such, we sought to restrict our analysis to census tracts where at least 20 percent of households earned incomes under the federal poverty line in 1990. The rationale for this threshold stemmed in part from the fact that scholars, such as Galster (2002) and Jargowsky (1997), considered a 20 percent poverty rate as a threshold for neighborhood social problems and other forms of distress.[2] Based on this definition, forty-six percent of all census tracts within the city of Chicago could be considered high poverty in 1990.

Our study also excluded census tracts that were within two miles of the Central Business District (CBD). We did so to avoid including the massive development projects, both publicly and privately-funded, that have collectively transformed the neighborhood known as the South Loop. This area, rail yards only two decades ago, added approximately 3,000 new housing units during the 1990s – an unprecedented amount of new housing for an inner-city neighborhood. Although this area was considered high-poverty in 1990, it can be considered an anomaly because the scale of infrastructural improvements and amount of public investment clearly distinguish it from other areas of the city more remote from the CBD.

The construction permits were conceptualized as "clusters" of new housing developments around the address(es) provided in the permit application. Individual Parcel Identification Numbers (PINs) from the Office of the Cook County Assessor were then mapped against the construction permit addresses to identify parcels that comprised each new construction cluster. The Assessor's Office provided data only on Class 2 parcels, which are those whose structures contain up to 6 residential units. The Class 2 designation includes condominiums, which are considered separate parcels that may share an address (though not a unique PIN) with other such parcels. It also includes single-family homes (with or without rental units), townhouses, and small (no more than 6 units) multi-family apartment buildings. As such, this designation includes parcels that are both owner-occupied and those that are rented out by absentee landlords.

Eighty-six percent of the construction permits were matched to their corresponding PINs.[3] To avoid sampling problems, we estimated the total number of units that we

[2] Moreover, in 1990, 19 percent of central city households in the United States lived below the poverty line (O'Sullivan 1996, 317).

[3] We assumed that unmatched permit data either had incorrect address information or were never built (or, at least, not in time to be assessed in 2003). In order to determine if we were introducing bias into the sample by requiring a match, we regressed critical locational data (e.g., distance to CBD) against a binary variable reflecting whether the construction data was matched

would have expected to be built based on the "total construction value" included in the permit application. We assumed that, during this time period, no units could have been built for under $75,000 per unit. If we were unable to find less than 20 percent of matching assessor data for the expected units, we eliminated PINs in these clusters for fear of under-sampling these clusters. In clusters where, with mapping and matching, we captured over 75 percent of the expected units, we randomly eliminated PINs so that the cluster would have, at a maximum, a 75 percent match rate. This reduced the possibility of over-sampling from these clusters. Clusters were retained in the sample if they had an expected number of units (total construction value divided by $75,000) greater or equal to 20. Developments smaller than this size were unlikely to have the types of urban design features that would characterize a TND- or enclave-type development.

After these corrections, we ended up with a sample of 1227 observations. Of this large sample, 823 observations had complete information, including critical data on the structural characteristics of each PINs. In our models, we use both the "small" (n = 823) and "large" (n = 1227) samples, modifying the independent variables according to the availability of complete data.

We used assessed values from one year (2003) instead of sales prices as our dependent variable for several reasons. First, in low-income neighborhoods, home ownership is a less prevalent form of housing tenure and concerns about overly small samples led us to use assessments. For example, only 17 percent of our small sample could be matched to subsequent sales transaction data. Second, confining the analysis to the subset of properties that sold may introduce selection bias if the sample of sold properties is significantly different from the unsold ones (Gatzlaff and Haurin 1997). Third, assessments reflect market activity as the Assessor reassesses each parcel triennially using information about sales of comparable parcels. This approach to estimating market value tends to be very accurate for newly constructed properties. Fourth, assessors "make up a less heterogeneous group than buyers and sellers and follow common procedures in the valuation of real property". Studies that have compared the use of assessments to sales prices find that assessments provide generally better statistical results than price models (Janssen and Soderberg 1999).

Class 2 parcels are assessed at 16% of their estimated market value.[4] In contrast, residential parcels of seven or more units, i.e. larger rental buildings, are considered Class 3 and are assessed at the higher commercial rate. The Assessor uses an income approach to estimate market values because such properties are typically operated as income-generating properties. As such, we examine only Class 2 buildings because of the complications associated with using buildings with different assessment rates and different approaches to estimating market values. Moreover, restricting our sample to

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or unmatched. In none of these regressions was this variable ever statistically significant. We conclude that successful matches were spatially random.

[4] The Office of the Cook County Assessor classifies property according to its use and applies different assessment rates to each use. This "bifurcated" classification system is the only one of its kind in Illinois and assesses residential properties substantially less than commercial and industrial properties (16 percent compared to 38 and 36 percent respectively).

Class 2 buildings eliminates problems associated with including properties developed by non-profits (Class 4) who frequently use deep subsidies such as the Low Income Housing Tax Credit. Such subsidy programs often come with strict design and rental guidelines that can influence the assessed value of the properties. Because of the difficulties of controlling for different sources of financing, we therefore opted to exclude Class 4 properties.

Independent Variables

Our hypothesis is that urban design has an independent effect on the assessed value of housing, controlling for the other structural and locational attributes that influence demand. As such, the hypothesis variables that capture different elements of urban design require more detailed explanation.

Since infill developments are constructed on scattered sites and are built incrementally by several different developers, we identified infill "clusters" in a slightly different manner than described above. To qualify for membership in an infill cluster, individual developments had to be located within 250 feet, or approximately half a block, of another new development. Clusters of such developments that contained more than 20 units were included in our development inventory together with large-parcel or adjoining-parcel developments (i.e., TND and enclave).[5]

Each qualifying cluster was field visited and photographed to obtain a representative visual sample of structures within each development and of neighboring, preexisting structures that directly adjoined the development. High-resolution aerial photographs and GIS figure-ground illustrations available from the Internet were also used. Visual development material was analyzed in two stages. First, infill developments were separated from larger adjoining-parcel developments in which four or more structures were adjacent to each other. Infill status was generally visible from aerial photographs and GIS maps, but was confirmed through analysis of site photographs where older structures could clearly be seen adjacent to new development. Those developments which did not qualify as infill were then analyzed according to the design criteria below to determine their urban design type. These developments included both larger apartment-type buildings and clusters of contiguous smaller structures such as rowhouses. Five design criteria were used to determine whether a development could be classified as an enclave or TND. The classification criteria were binary in nature and were determined through visual inspection. These criteria included the following:

[5] The 250-foot distance was used because this was considered a distance beyond which developments were neither visible nor closely accessible to each other. Clusters were created by address-matching all qualifying building permits to a GIS database and buffering for each development. Buffers were then joined to create individual clusters, which were then sampled to remove those clusters with less than 20 total units.

Did the development have:

1) parking lot in front?
2) roadways interior to the lot, such as driveways or access roads?
3) front doors opening onto interior walkways, roadways, or open space rather than a public street?
4) extensive buffering (substantial trees, plantings, open space, or landscaped berms) between the building and the street?
5) different facing (façade) materials than immediately adjacent existing buildings?

Photographs of sample enclave, TND, and infill-type developments (Figures 1, 2, and 3) are provided in the Appendix.

Each of these criteria becomes the basis of a binary variable in some of our model specifications (See Models (2) and (4) below). Establishing individual design criteria was necessary for two reasons. First, many developments could not be classified as "pure" enclaves or TNDs. This made distinguishing between these two design types difficult in these cases. Second, the criteria provided additional resolution for our model, allowing us to identify the elements of the design types that are most important. For each criterion, a "Yes" answer was more characteristic of an enclave design model. Those developments in which three or more design criteria received "Yes" scores were considered to be enclave-type developments, and those developments in which three or more design criteria received "No" scores were considered to be TND-type developments. By the end of this process, each PIN had been classified into one of the three design types: enclave, TND, or infill. The binary variables, *TND* and *ENCLAVE*, form our hypothesis variables in some of the specifications (see Models (1) and (3) below).

New construction was widely dispersed across the high-poverty neighborhoods of the city, as shown in Figure 4 (see Appendix). In our small sample, 41 percent of properties fell within enclaves, 21 percent fell within TND developments, and the remaining 38 percent fell within infill clusters. In our large sample, 36 percent of properties fell within enclaves, 20 percent fell within TND developments, and the remaining 44 percent fell within infill clusters. In both the small and large samples, the average assessed values were significantly higher for properties in clusters of infill developments than they were for properties located in enclaves or TND-type developments (see Table 2). Of course, this value difference may not have been "caused" by the urban design designation.

In addition to dummy variables reflecting urban design types and attributes, we include other site-specific variables that will likely influence the value of the property: structural variables, cluster size, demographic variables, and location variables. Descriptive statistics for the small and large samples are included in Table 3 (see page 29).

Table 2. Mean assessed value (16% of market value) for three urban design types

	Small sample (n=823)	Large sample (n=1207)
Enclave	$32,909 (st dev: 16,224)	$31,872 (st dev: 14,723)
TND	$31,372 (st dev: 18,466)	$30,159 (st dev: 16,467)
Infill	$49,688 (st dev: 18,220)	$41,573 (st dev: 18,083)

We assume that parcels with more bathrooms and bedrooms will be more valuable and that the number of these rooms is a good proxy for the size of the building part of the parcel. The average parcel has 3 bedrooms and 2 bathrooms, which make our sample parcels on the large side. However, conversations with developers reveal that this is standard for market rate products, even in initially lower-income neighborhoods. We expect that parcels with frame buildings (*Exterior construction*=0) are worth less given that they are considered less durable and show their age more than masonry exterior construction. In estimations using the large sample, we do not include these variable*s* because we lack complete information for a third of the total observations.

We also include a variable that captures the area of the land on which the building is located. Larger-sized parcels may imply more amenities and developer control over a larger environment and therefore may be more valuable. On the other hand, larger parcels have the potential to be more isolated from the urban context. Subdivision of a parcel into more than one unit may result in either an increase or decrease in value, as the relationship between value and unit number may not be linear. Whereas a two-unit parcel may imply the existence of a single rental unit controlled by the owner-occupier, a six-unit parcel may be a multi-family rental building that is less valuable. Ideally, we would like to control for the housing tenure of each parcel as well as its land and development costs. Unfortunately, such data is generally considered proprietary information and is generally unavailable.

In general, housing depreciates over time, and so we expect older parcels (*age in 2003*) to be less valuable. We do not control for appreciation because we are looking at valuations that occurred within the same year (2003).

We assume that the size of the cluster of new development (*number of units in each cluster)* has an impact on the value of individual parcels. Theories about development externalities would have us believe that larger scale projects provide more assurance of the kind of development that will occur in the future and that potential residents are willing to pay more for this kind of predictability.

A parcel's value can also be affected by the economic and demographic characteristics of the surrounding neighborhood. We include variables that measure the median household income, percent owner-occupied housing units, percent African-American, and percent Hispanic. Data were extracted from the 2000 Census to measure conditions at the time of

our study period. Even though we restricted our sample to those neighborhoods where 20 percent of residents fell under the federal poverty line, we assume that residents prefer to live in the more affluent of these high-poverty census tracts, especially those where there are higher rates of home ownership. Given the history of racial discrimination in housing choice and lending, parcel values may be reduced by the share of racial and ethnic minorities in the census tract.

We include a dummy variable that measures whether the parcel had sold at least once during our study period. We include such a variable because these parcels are more likely to be owner-occupied rather than rented by a landlord. They may therefore be more valuable.

Traditional models of urban structure posit a strong relationship between access to the CBD and land values (Alonso 1964). To account for the impact of this rent gradient on housing values, we measured the distance of all parcels in miles to the corner of State and Madison streets, the base point for Chicago's street numbering system. All else being equal, proximity to this point should increase the value of the parcel.

Unfortunately models that measure the distance to one urban center may not adequately capture location-specific demand for housing in cities like Chicago. In a metropolitan region with widely dispersed transit connections and other features that are not centrally located, neighborhood factors unrelated to the proximity to downtown are likely to also be critical to a structure's value. Therefore we have included distance to Lake Michigan and distance to closest public transit stop, assuming that commuters value this proximity and that housing values may be more likely to increase near this infrastructure. Proximity to other land uses, such as industrially zoned land, may negatively influence parcel values and so we include a variable that captures the percentage of industrial and commercial equalized assessed value in the parcel's quarter section.[6]

Changes in the equalized assessed value between 1989 and 1997 in the associated quarter-mile section give us some indication of recent change in the surrounding property values. We expect parcels in appreciating areas to be more highly valued, as investors wish to buy into areas where they can get their initial equity investment back and make a profit. Property value data by quarter-section were provided by the Office of the Cook County Clerk.

Results

The results from our regression analysis are presented in Table 4 (see page 30). The regressions show the relationship between the listed explanatory variables and the assessed values of the parcels in our sample (recall that assessed values will be 16 percent of the parcel's market value). The first and second columns display results for the small and most controlled sample, while the third and fourth columns shows results for the larger sample, with omitted variables. The adjusted R^2 values range from 28 percent

[6] A quarter-section is a one-half mile by one-half mile area often used for planning and geographical analysis of the Chicago metropolitan area.

(large sample using the design type hypothesis variables) to 86 percent (small sample substituting the individual design criteria hypothesis variables), indicating that the explanatory power of the models is, in some cases, very high.

The coefficients on the structural variables tell a consistent story: the more bathrooms and bedrooms a parcel has, the greater its value. In Model (1), neither the materials used for exterior construction nor the square footage of land are significant at the 1 percent level, indicating an indifference to frame or masonry construction and larger or smaller sized sites. In the other three models, however, the coefficient on land square footage is negative and significant, indicating that parcels containing larger swaths of land are less valuable. While counter-intuitive on its face, this result may reflect a preference for smaller-scale development.

For the smaller sample, the coefficient on number of units associated with the individual parcel is negative and significant: those parcels with more units, most likely multi-family rental apartments, are considered to be less valuable. Model (3) uses the larger and less controlled sample where several of the structural characteristics are unknown, namely number of rooms and exterior construction. In this case, the sign on *number of units* changes and become positive. Perhaps because of the omission of critical structural variables, this variable is accounting for some of the influence of variation in living space.

The negative and significant coefficient on *age in 2003* in Model (1), older buildings, i.e., those built at the beginning of our study period, are less valuable in 2003. This variable is significant model (3) and changes sign. In the larger sample, newer construction is considered less valuable. In Models (1) and (2), the coefficient on our sales dummy is positive, indicating that houses that sold during this period were also valued higher by the assessor.

The coefficient on the cluster size variable should provide insight into the role that the scale of development plays on the values of individual properties. This coefficient is only significant in Model (2), where the regression is run without infill developments. Its positive sign implies that when only TND and enclave developments are considered, the larger developments, i.e., any development type clusters with a larger number of units, contain higher valued homes. This finding supports the notion of "safety in numbers", i.e., that scale reduces the negative externalities associated with the unpredictability of neighboring development.

Consistent with expectations, the census tract's median household income was significant and had positive relationships with value. Parcels are more valuable in areas with wealthier households. However, the share of owner-occupants had a significant and counter-intuitively negative impact on value in all of the models. This finding might reflect the influence of gentrification; i.e., houses were more valuable in tracts with higher shares of renters whose houses may be in the process of being converted to owner-occupied units. The shares of African-American and Hispanic residents in the census tracts are significant in several cases, but the signs on these coefficients are inconsistent

across the four models. When the five individual design criteria are substituted for the dummy variables representing the two design types (as in Models (2) and (4)), the signs change from negative to positive. It is possible that in eliminating the infill developments from this model, we are also eliminating some of the important variation in racial composition of the neighborhoods.

The relationship between value and the location variables in all specifications are consistent with our expectations. All else being equal, homes are more valuable near the CBD, Lake Michigan, and the closest public transit stop.

Like the signs on the coefficients for the racial variables, the signs on area appreciation differ depending on whether the infill parcels are included. In Models (2) and (4), when the infill parcels are taken out of the sample, the coefficient on this variable is significant and positive, as one would expect: parcels located in quarter-sections with more prior appreciation were also more valuable. In Model (1), however, the coefficient on this variable is negative. In the models using the small and more complete samples, the land uses of nearby property mattered: parcels in areas with a high percentage of commercial and industrial uses were less valuable. The negative externalities associated with differing land uses—which could lead to additional noise and congestion—may suppress values. It should be noted that when some of the larger-sized parcels are removed from the large sample, none of the regression results change except for the significance levels of these two coefficients. *Change in area appreciation* and *share of commercial and industrial property* lose their significance, leading us to discount the contradictory signs on these variables.

The most critical coefficients for our study are those on our hypothesis variables, the set of binary variables reflecting urban design type and the individual design criteria. Using both the small and large samples, the coefficients on the variables measuring whether the parcel was located in an enclave or a TND-type development are negative. The results imply that being part of such larger-scale, "planned" developments triggers a value "penalty" when compared to infill locations. An identical building located in a cluster of infill development will be worth much more. Specifically, in the small sample, the assessed value of an identical home decreases by 24 percent and by 21 percent depending on whether that home was located in an enclave or a TND development, respectively.[7] In the model using the large sample, there is a price penalty of approximately 22 percent for location within an enclave and 27 percent for location within a TND.

Disaggregating the two urban design types into individual, smaller-resolution urban design elements allows us to deduce whether there are specific urban design features that housing consumers (and assessors) do not like about TNDs and enclaves. For Models (2) and (4), all parcels that fell within infill clusters were eliminated so that TND developments could be compared to enclave developments, and those developments that were more difficult to classify into one or the other category (i.e., possessed one or two

[7] In a semi-log regression, the coefficient on a dummy variable can be interpreted as follows: when *TND* and *ENCLAVE* change from 0 to 1, the value of the parcel will change by [Exp(b)-1] x 100 percent.

urban design features characteristic of the other category) could be allowed to vary in different ways. This appears to have been a useful exercise as the majority of the coefficients on these dummies are significant and the explanatory power of the models increases when we substitute these criteria for the larger-resolution urban design types.

Specifically, if value is an indication of preferences, residents prefer to have some buffer between their living quarters and the street, possibly plantings and landscaping. They also prefer to have parking in front of their homes, i.e., a parking lot between the street and their homes. Both of these urban design features are characteristic of enclave-type developments, where both plantings and parking isolate housing from its surroundings. Conversely, the negative and significant coefficients on two of the other binary variables, *building material different from context* and *opens to the yard*, suggests that residents prefer to be more integrated into their surroundings. Entrances that do not face the street and façades constructed out of materials different from neighboring buildings reduce the value of properties within these planned developments. The effect of a private road was contradictory: for the smaller and more controlled sample, it was an asset while in the models using the larger sample, it was considered a liability.

Conclusion

Our findings indicated that urban design is a significant contributor to assessed values, and that the three different urban design models described in the study play a meaningful role in determining housing values in the Chicago neighborhoods examined. Three principal conclusions can be drawn from these findings. The first, and perhaps most important, conclusion is that infill-type housing commands a value premium. From this we might intuit that consumers value urban housing that is closely integrated into its urban context, rather than separated from it.

Our second conclusion is related to the finding that both TND- and enclave-type developments suffered price penalties as compared to infill-type developments. We suggest that consumers do not prefer housing dissociated from its context, perhaps in part because these consumers may have a residual bias against larger-scale, homogeneous housing developments in distressed neighborhoods that can be linked to negative associations with public housing, which has a history of physical separation from its surroundings as well as high levels of socioeconomic distress.

Our third conclusion is that developers of enclave- and TND-type developments can improve the image, and potentially the value, of these developments by including urban design elements that link new developments to the existing urban fabric instead of rejecting it. In particular, the provision of building entrances that promote the direct interaction of a structure with its public context and resisting the construction of interior roadways which isolate a development from its surrounding may overcome the isolation or stigma of these larger-scale developments. At the same time, residents prefer some degree of separation between the private space of the home and/or development and the activity of a public street, as well as the accessibility and potential security of parking

located directly in front of their building. While neither of these latter two urban design features are consistent with infill-type housing, they do maximize convenience for residents, which appears to overcome the negative consequences of reduced interaction with the surrounding neighborhood.

We draw our conclusions with the caveat that we do not know how much of the observed value differential is due to differences in land acquisition and development costs for our three different design types. Because such data is proprietary, we were unable to control for differences in total development costs. Interviews with housing developers suggest that while such per unit costs may be higher for infill developments (because of the inability to capitalize on economies of scale), the cost of building enclave-type developments may also be pushed higher because of the requirements for privately provided roadway infrastructure and additional landscaping. Moreover, when we ran the models without infill developments (Models (2) and (4)), we discovered that our design criteria variables remained statistically significant.

Our finding that larger-scale developments, whether enclave- or TND-type, are less valuable than infill housing confirms the work of those theorists, beginning with Jane Jacobs, who have argued that urban development that is integrated with its surroundings, rather than isolated from it, is the most desirable form of new urban development. Infill development is more clearly part of an existing neighborhood, even if the new housing itself is somewhat different architecturally than existing older units. The fact that this housing is highly valued implies that the residents of these houses (and, by extension, the Cook County Assessor) recognize the connection of this housing to surrounding neighborhoods, institutions, and urban networks, whether those connections be physical, social, or economic. While this finding might be expected to be the case in higher-income urban neighborhoods, it is somewhat more surprising to find that this was the case in initially low-income neighborhoods given what the literature portrays as an overriding concern for personal and property security. Even in initially distressed locations, residents of new housing value their physical connections to their neighborhood.

New Urbanist theorists and practitioners have argued that designing new housing developments according to TND urban design principles rather than modernist or "conventional suburban" (Duany et. al. 2000) design principles is desirable and appropriate for multiple reasons, including increased social capital (Bothwell, Gindroz, and Lang 1999) and increased neighborhood perceptions (Deitrick and Ellis 2004). The findings of this study may support this claim in that they indicate that TND-type housing slightly moderates, though it does not erase, the value differential between infill-type and enclave-type developments. While TND developments are similar to enclave-type developments in that they are large "planned" developments, they are better linked to their surrounding communities and are developed with housing that addresses the urban context in a manner similar to that of existing older urban neighborhoods, where housing is relatively close to the street, faces the street, and has rear or no parking.

Our findings also indicate a slight preference against enclave-type developments, which may have its origins in one or both of the following explanations. First, consumers may

be less interested in developments that have little spatial relationship with their context. Enclave-type developments do not reflect confidence in neighborhood stability or desirability, nor do they attempt to create a typological or stylistic relationship between the development's housing and that of its surroundings. The bias against enclave-type developments may also reflect a residual community mistrust of "project"-type developments, a legacy of the era of large-scale, modernist "tower in the park" public housing complexes that were as isolated from their surroundings as enclave-type developments are from theirs. It is worth noting, however, that most of the enclave-type developments in our samples followed a suburban design model more than a modernist one. As such, the bias may simply reflect the fact that consumers interested in living in urban neighborhoods are more interested in living in homes whose urban design reflects their urban environment rather than ignoring it or emulating a suburban model.

While the value penalty differential between TND-type and enclave-type developments is slight, individual urban design characteristics had significant impacts on housing values. Two of these characteristics- private roadways and entrances facing private space- had negative impacts, and two- front parking and buffering from the street- had positive impacts. The values placed by residents on these latter two urban design features may not be reassuring to New Urbanists, who strongly advocate parking in the rear rather than in the front of buildings. However, this finding is consistent with previous research (Talen 2001), which indicated that particular urban design features characteristic of suburbia, particularly spatial isolation, were strongly preferred by residents of those areas even as some TND-type features were also preferred. In other words, residents of TND-type housing may prefer some urban design aspects typical of these developments (houses facing the street, a lack of isolating roadways) while not necessarily appreciating other TND-type aspects. Our findings indicate that a similar argument can be made for residents of enclave-type developments- certain urban design features (convenient front parking and privacy) are valued, while others are not. Residential preferences are not always consistent, and neither urban design approach appeared to completely satisfy consumers to the degree achieved by infill-type developments.

The findings of this study should be reassuring to urbanists who believe that the best way to revitalize urban neighborhoods is to respect and augment the urban design character of existing places rather than to attempt to transform them into another type of neighborhood entirely. Our findings indicate that the more closely housing can be integrated into its context, the more highly valued that housing will be. Cities considering or experiencing the large-scale redevelopment of distressed neighborhoods may want to consider these findings as they establish planning guidelines for the redevelopment of these neighborhoods. Moreover, municipal planning and development departments may want to reassess the formal and informal design standards for publicly-assisted housing in these neighborhoods if they possess knowledge that different urban design types for new housing are valued differently by residents. A lack of knowledge about the costs or benefits of the emerging development models of privately-financed housing in distressed urban neighborhoods may compromise future development of such projects and the improvement of struggling neighborhoods.

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Figure 1. Typical Enclave-type housing.

Figure 2. Typical Traditional Neighborhood Development-type housing.

Figure 3. Typical Infill-type housing.

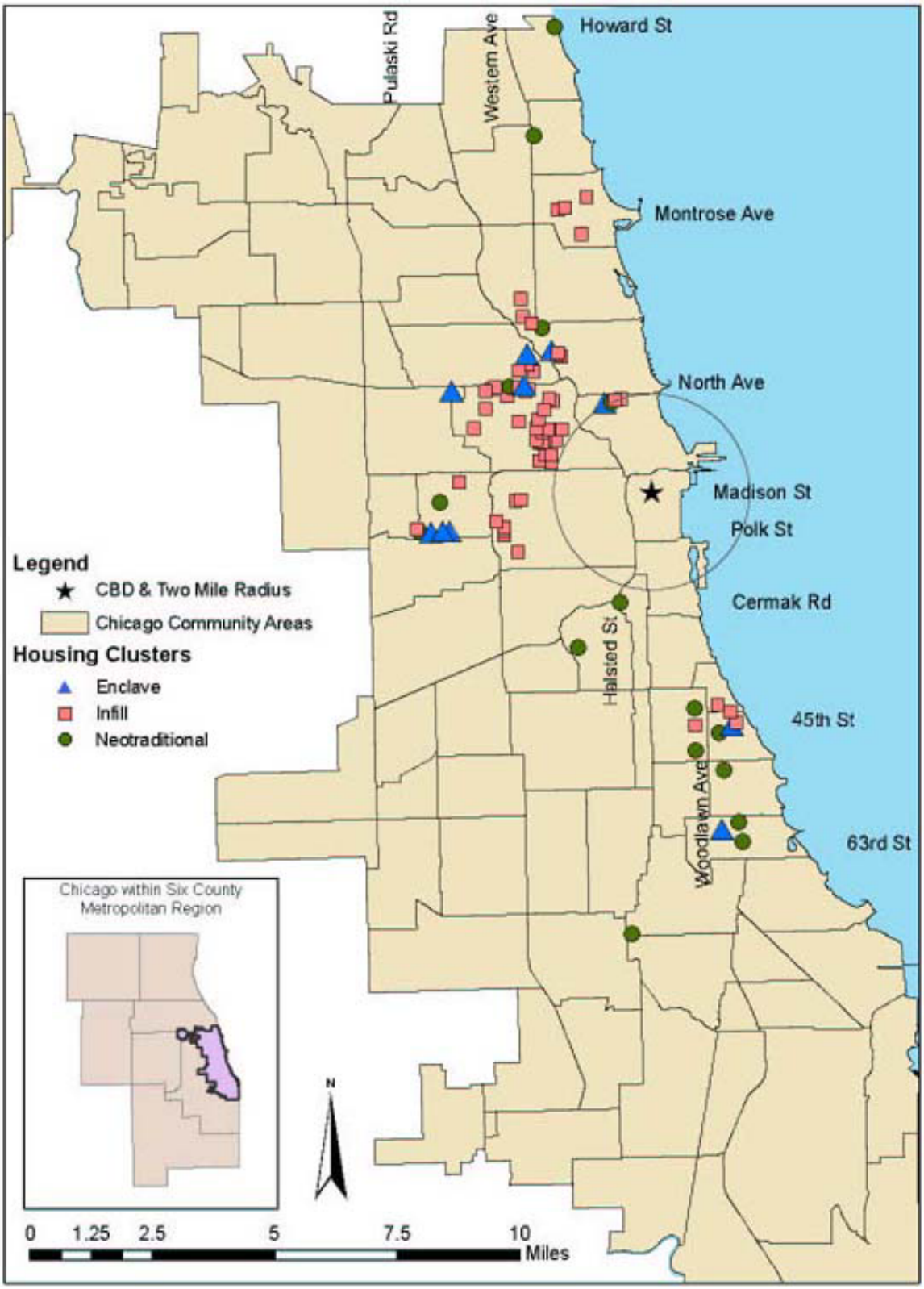

Figure 4. Location and Urban Design Type of Developments.

	Small sample (n = 823)				Large sample (n = 1227)			
	MIN	MAX	MEAN	ST DEV	MIN	MAX	MEAN	ST DEV
Assessed value	2946	126564	38943	19390	2057	126564	35750	17372
Units in cluster	6	240	82	83	6	240	83	85
Units in parcel	1	6	1	.82	1	7	1.27	.87
Age in 2003	1	10	6.07	2.07	1	10	5.47	2
Square footage (land)	520	34000	1957	1680				
Bathrooms	1	10	2.27	1.26				
Bedrooms	2	18	3.5	1.9				
Exterior construction	0	1	.81	.39				
Household income	12599	95075	46511	21140	12599	95075	49182	22041
Share owner-occupied	.04	.71	.39	.14	.04	.71	.39	.16
Percent Black	.01	.98	.38	.42	.01	.98	.31	.39
Percent Hispanic	.00	.80	.22	.21	.00	.80	.23	.20
Any recent sale?	0	1	.17	.38	0	1	.12	.32
Distance to CBD	2.01	7.67	4.02	1.30	2.00	9.69	3.91	1.34
Distance to el stop	.06	1.31	.55	.30	.06	1.31	.52	.28
Distance to Lake Michigan	.22	5.06	2.29	1.30	.06	5.06	2.27	1.16
Percent change EAV	46	588	287.62	149.71	21.67	588	317	151
Percent comm./ind EAV	.05	.70	.37	.16	.05	.70	.36	.15
TND	0	1	.21	.41	0	1	.20	.40
Enclave	0	1	.41	.49	0	1	.36	.48
Infill	0	1	.38	.49	0	1	.44	.50

* Assessed values for residential properties under 7 units are 16% of estimated market values

Table 3. **Descriptive statistics for small and large samples.**

Table 4: Regression Results Dependent Variable: Assessed Value 2003				
	Small Sample		**Large Sample**	
	Model 1	**Model 2**	**Model 3**	**Model 4**
Full baths	0.029* (1.928)	0.046** (2.234)		
Full bedrooms	0.078*** (6.125)	0.089*** (5.994)		
Exterior construction	0.029 (1.00)	0.025 (0.886)		
Square footage (land)	-.0000 (-0.073)	0.000* (1.705)	-0.000*** (-5.215)	-0.000*** (9.781)
Units in parcel	-0.11*** (-3.789)	-0.116*** (-2.974)	0.048*** (3.195)	-0.019 (1.135)
Units in cluster	-0.0004 (-1.51)	0.010*** (9.213)	0.0005 (1.479)	0.000 (0.723)
Age in 2003	-0.029*** (4.97)	0.004 (0.687)	0.019*** (2.717)	-0.013 (1.419)
Median income (tract)	0.00002*** (11.67)	0.000*** (5.410)	0.000*** (6.934)	0.000*** (8.946)
Percent owner-occ. (tract)	-1.679*** (-9.07)	-3.402*** (5.848)	-.847*** (4.480)	-1.710*** (3.772)
Percent Black (tract)	-0.389*** (-6.01)	8.894*** (10.834)	-0.201** (2.418)	1.945*** (4.703)
Percent Hispanic (tract)	-0.365*** (-3.34)	20.919*** (11.543)	-0.005 (0.038)	3.320*** (4.130)
Any recent sale?	0.077*** (2.69)	0.038 (1.417)		
Distance to CBD	-0.110*** (7.77)	-0.563*** (6.492)	-0.040*** (3.176)	-0.104*** (5.604)
Distance to Lake Michigan	-0.406*** (7.49)	-0.491*** (3.057)	-0.312*** (4.694)	-0.099 (0.563)
Distance to closest “el” stop	-0.020 (1.57)	-0.173*** (3.446)	-0.060*** (3.733)	-0.370*** (8.306)
Percent change in EAV (quarter-section)	-0.001*** (7.04)	0.019*** (11.381)	-0.000 (1.370)	0.000*** (3.216)
Percent commercial and industrial EAV (quarter-section)	-0.543*** (6.16)	-5.024*** (12.192)	-0.139 (1.304)	0.496** (2.536)
In “enclave”?	-0.219*** (-4.76)		-0.203*** (3.496)	
In “TND”?	-0.195*** (-4.29)		-0.243*** (5.273)	
Building material different from context?		-1.840*** (-11.084)		-0.412*** (3.283)
Served by private road?		1.545*** (8.199)		-0.591*** (3.343)
Parking lot in front?		3.853*** (13.031)		1.130*** (5.372)

Opens to yard?		-5.227*** (-12.238)		-0.627*** (2.833)
Buffered from the street?		1.513*** (7.132)		0.914*** (5.102)
Constant	11.63*** (78.41)	-2.638** (2.398)	10.66*** (71.190)	8.873*** (23.529)
Adjusted R^2	.679	.862	.282	.496
N	823	511	1227	692