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# Measuring the Impact of a Community Revitalization Program

## The Case of Beyond Housing in Pagedale, Missouri

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# Measuring the Impact of a Community Revitalization Program: The Case of Beyond Housing in Pagedale, Missouri

*The paper examines the impact of a comprehensive housing development program initiated by a nonprofit organization working in a small municipality in St. Louis County, Missouri. The development program includes rental housing, for sale housing and repair grants to existing residents. The analysis serves both as opportunity to test hedonic price modeling on the housing work and as an examination of the applicability of such techniques in evaluation of local community development efforts. The analysis finds evidence of price differential comparing municipal sales to sales within a comparable, larger geographic area, with a negative differential switching to positive over the time frame studied. However, sample sizes and other methodological issues make it difficult to ascertain a direct spill-over effect of investments for any of the three investment types within a 150' area around project sites.*

**Key words:** *community development, housing, hedonic price modeling*

## Introduction

Poverty continues to be a problem for many individuals and families in America (American Community Survey, 2005), creating problems ranging from inadequate calorie intake (McGovern, 2001), health problems (Mullahy and Wolfe, 2001), low performance in school (Brooks-Gunn and Duncan, 1997; Duncan, Yeung, Brooks-Gunn, and Smith, 1998), and the inability to "... fully partake of the freedoms, rights, and opportunities to which all citizens are theoretically entitled" (Rank, 2004, p. 182). Further complicating the lives of poor households is the fact that many of them live in neighborhoods with high concentrations of poverty. High-poverty neighborhoods concentrate the impact of poverty on individuals (Jargowsky, 1997; Wilson, 1987) and also cause systematic social problems such as underperforming schools, delinquency, and high rates of crime (see for e.g., Gephart, 1997; Jencks and Mayer, 1990; Leventhal and Brook-Gunn, 2000; Sampson, Morenoff, and Gannon-Rowley, 2002). While concentrated poverty in the large urban centers of America is on the decline, there has been an increase in concentrated poverty in suburban neighborhoods during the 1990s (Kingsely and Pettit, 2003) at a time when both practitioners and scholars traditional focus on large urban centers (for e.g., Wilson, 1987).

These interrelationships between individual and community level concerns requires community advocates to develop comprehensive interventions to bring systemic change, a complex task in most center cities made more so in suburban jurisdictions with little community development experience. Much of this work, for urban as well as suburban communities, is done by non-profit organizations (Salsich, 1989; Walker and Weinheimer, 1998). The need to measure impacts on a variety of levels complicates the evaluation of community work for researchers as well. While a considerable amount of research has been conducted focusing on individual

outcomes and the impact of asset- building strategies that attempt to raise the wealth and capacities of individual households (for e.g., Center for Social Research, 2004), there is less guidance on how to measure the improved quality of neighborhoods (Ellen and Turner, 1997; Ellen, 2007), much less in a manner that can be meaningfully communicated to community advocates. In the words of one report on measuring performance and capacity for asset-building strategies, “it is easy to assume that individual asset ownership will have positive spillover effects to the neighborhood – homeowners will work to improve their neighborhood conditions in order to protect their investment” (Center for Social Development, 2004: 48). The key is developing a method to suggest how neighborhood strategies impact the underlying forces that shape community conditions and, in turn, contribute to the well-being of poor families.

In this paper, we utilize the work of Beyond Housing, a St. Louis, MO, non-profit attempting to revitalize a high-poverty, predominantly African-American, suburban municipality, in order to provide a method for measuring the impact of community development efforts. The non-profit agency has taken an asset approach to community revitalization (Krehmeyer and Harness, 2007), an approach that focuses on the creation of wealth and assets among individuals and households to lift them out of poverty (Shreiner and Sherraden, 2007). Their strategies explicitly focus on local community housing conditions, utilizing three main components: (1) development of for-sale housing, (2) provision of repair grants to existing homeowners, and (3) development of rental housing. In order to understand the impact of community development activities, we borrow from the field of urban econometrics, specifically those studies modeling the impact of neighborhood investments on local property sales. In the next section we review significant past research and draw lessons related to each component of the asset model.

### **Lessons from Past Research**

This analysis utilizes primarily econometric techniques used by urban economists and housing policy scholars to investigate the impacts of the organization’s housing strategies. Past research provides both models relating to the three main strategies as well as some expectation of the findings.

#### *Owner-Occupied Housing*

Past research on the impact of new housing has produced mixed results. For example, a study of two Nehemiah developments subsidized by the City of Philadelphia, Cummings, DiPasquale, and Cummings (2002) found no evidence of local price increases in response to the program. On the other hand, some scholars have found considerable support for the idea that new construction in a neighborhood is likely to increase house prices in that neighborhood and its surroundings (see for e.g., Ding and Knapp, 2003; Ellen, Schill, Susin, and Schwartz, 2001; Lee, Culhane, and Wachter, 1999). The most robust of the analyses have used some version of hedonic price modeling to estimate the impact of new housing on sales, with the critical distance measure ranging from 150 to 300 feet<sup>1</sup> (Simons, Quercia and Meric, 1998; Ding, Simons and Baku, 2000). Moreover, some studies suggest that small-scale investment has little impact on sale price

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<sup>1</sup> 300 feet is equivalent to about one city block.

and suggest that policies should encourage concentrated investments that are large enough to observe the effect (for e.g., Ding, et. al., 2000). Additionally, some studies have found general support for the proposition that overall increases in homeownership within a neighborhood bolster single-family home values (for e.g., Rohe and Stewart, 1996), although others have questioned whether these findings resulted from neighborhood sorting by households as much as the impact of homeownership rates (Haurin, Dietz, and Weinberg, 2003).

### *Housing Rehab/Repair Grants*

Conventional wisdom suggests that the rehabilitation of property as well as proper maintenance of existing housing stock creates incentives for other neighbors to invest, leading to greater property values and sale prices (Haurin, Dietz and Weinberg, 2003). However, results from studies in the field are mixed, with some studies showing a negative effect (Simons, et. al., 1998), as improved housing crowds out existing obsolete housing stock, and other studies showing a positive impact (for e.g., Culhane, and Wachter, 1999; Ioannides, 2002). Like studies on the impact of new housing, the most robust of these studies utilize hedonic price modeling (for e.g., Lee, Culhane, and Wachter, 1999), as well as various ways of mapping the relationships between sales and investment sites (for e.g., Ding, Simons and Baku, 2000).

### *Rental Housing*

Unlike new construction and rehabilitation, which have been generally portrayed as having a positive impact on housing values, there is no real consensus on rental housing developments and their impact on housing prices (for e.g., Santiago, Galster and Tatian, 2001; Green, Malpezzi and Seah, 2002; Schill, Ellen, Schwartz and Voicu, 2002; Ellen and Voicu, 2006; Ellen, Schwartz, Voicu, and Schill, 2007). There is strong evidence that impact depends heavily on the type of rental project. For example, using a repeated sales method, Green, Malpezzi, and Seah (2002) find that Low Income Housing Tax Credit (LIHTC) programs in Wisconsin do not diminish housing prices.<sup>2</sup> In an examination of the spillover effects of four different federally subsidized rental housing programs (Public Housing Program, Section 8 Program, Section 202 Program for the Elderly, and the LIHTC), a New York study finds that the Section 8 program has the largest negative effect on housing prices, that rental houses built under Section 200 and LIHTC have a positive impact on housing prices, and that results related to public housing for the elderly are mixed; small projects have a positive impact while larger projects have a negative one (Ellen, Schwartz, Voicu and Schill, 2007). Additionally, the results vary as a function of the scale and location of the projects. Rental housing can have negative impacts in both high-poverty neighborhoods (Green, Malpexx and Seah, 2002) and African-American areas (Santiago, Galster, and Tatian, 2001). Because rental projects are more likely to be in distressed neighborhoods, one study modified the hedonic price model to examine the difference between house prices in the neighborhood where the rental property was constructed or rehabbed and prices of comparable properties outside of these neighborhoods pre- and post-construction

<sup>2</sup> Repeated sales methods utilize sales of properties that have been sold at least twice as the dependent variable of interest in the analysis. Its advantage is that the hedonic method requires data on unit and neighborhood characteristics and location that can be difficult to obtain. Conversely, the repeated sales method requires a degree of certainty that property conditions have not significantly changed between sales (Green et al., 2002).

(Schill, Ellen, Schwartz and Voicu, 2002). On that basis, the study found that the gap generally narrows from pre-construction prices to post-construction prices in these distressed neighborhoods. In terms of scale, research generally concludes that larger projects have larger impacts (negative or positive), although there is some countervailing evidence (for e.g., Lee, Culhane, and Wachter, 1999). Schill et al. (2002) find that the larger city assisted-housing developments are, the greater the reduction in the gap between pre- and post-completion house prices. Finally, there is some support that suggests that non-profit and for-profit developers may have different impacts and that this impact might vary with the scale of the project (Ellen and Voicu, 2006).

### *Implications of the Literature for the Pagedale Analysis*

The existing literature provides some expectations on the impact of Beyond Housing's activities in Pagedale as well as some methodologies for measuring that impact. Most significantly, the Pagedale analysis is more limited in scope than most of the studies referenced above. In this case, the analysis considers a relatively small number of investments – 34 rental projects, 27 for-sale projects and 51 rental projects – within a small municipality that is predominantly low-income and African American. By contrast, most of the existing literature examines a much larger number of projects over a much larger geographical area with a much broader diversity of socio-economic conditions. Further, as discussed below, the bulk of the impact analysis relies on a relatively small number of property sales. These differences in the Pagedale case limit the reliability of the analysis and limit the effectiveness of the preferred methodology, hedonic price modeling. The size of the study area also necessitates a tighter definition of an impact area: 150 feet. While this measurement is used in some studies, it does represent a relatively short distance around the investment sites.

Additionally, the investment data lacks some key variables that would enhance the analysis and answer some important questions. For example, the investment data lacks clear dates for when the projects began and ended, making the estimation of temporal effect difficult. The rental project data does not contain funding data, making discussion of certain types of rental projects impossible. Likewise, all of the rental projects are one or two-unit scattered sites, meaning that the analysis does not evaluate the impact of large multi-family projects compared to scattered-site projects.

## **Conceptual Framework**

In this paper we suggest that hedonic price modeling and other estimation techniques of property sales values might be a valuable part of the evaluation of the emerging community revitalization strategy of asset building (Page-Adams and Sherraden, 1997). Asset accumulation as a strategy for community development was introduced by Michael Sherraden (1991) in his book, *Assets and the Poor*. From an asset perspective, “[t]he question of how to escape from poverty is, in essence, the question of how to save and accumulate assets” (Schreiner and Sherraden, 2007, p. 20). While the term “assets” can take on a variety of meanings, Sherraden (1991) defines them as property and financial holdings.

While Sherraden's initial work focused on building individual assets, in this paper we are primarily concerned with building neighborhood assets. From an asset perspective, neighborhood quality can most aptly be summed up as a house's monetary value to the neighborhood – that is, how much a house contributes to increasing housing prices in the neighborhood. By focusing on a neighborhood's housing stock as a type of financial asset, theory can be tied more directly to traditional economics. As Sherraden (1991) indicates, “focusing on financial assets is what social policy can do best and with the least bureaucracy” (p. 106-107). Furthermore, housing prices are frequently cited in the literature as an indicator of neighborhood quality (Ding and Knapp, 2003). While housing prices do not provide a perfect measure of neighborhood quality, according to Ding and Knapp (2003), housing prices have been shown to have a high correlation with neighborhood quality. Another argument for the use of sales prices as an outcome variable in the analysis is their importance to the decision-making of individual developers, both non-profit and for-profit. Increasing sales prices motivate existing and potential developers to expand and sustain their work.

One way that neighborhood quality can be lowered is through physical decay and vacant lots. Physical decay and vacant lots in a neighborhood have been identified in the literature as causes for low neighborhood quality ratings (Greenberg, 1999). Given this, run-down houses and vacant lots can be thought of as one kind of drain on neighborhood assets – i.e., they lower housing stock value. Findings suggest that lower housing stock prices might lead to higher tax delinquency rates (Simons, Quercia, and Maric, 1998) or a loss in neighborhood income. In this sense, asset-building strategies that focus on housing redevelopment—for-sale, rental, or renovation—might be one way to help stop this vicious cycle of neighborhood disinvestment.

Haurin, Dietz and Weinberg (2003) state that a neighborhood effect occurs “when an individual's or household's characteristics or actions affect the neighbors' behaviors or socioeconomic outcomes” (p. 120). The potential of new construction, rehab, and rental housing programs to stimulate neighborhood effects could make them an important part of a community revitalization initiative. While there is evidence that each of these strategies might have neighborhood effects that are capitalized into housing prices, more empirical evidence is needed. Moreover, while we are focusing in this analysis on these three strategies, others might also be important in creating a model for building neighborhood assets and reducing neighborhood poverty. For example, Brasington and Haurin (2006) find that school test scores and school expenditures are capitalized into housing prices.<sup>3</sup>

The three asset strategies examined in this study were chosen because they are the focal point for a neighborhood asset-building initiative run by the nonprofit organization Beyond Housing, working in Pagedale, MO, the site of this study. The neighborhood effects literature treats homeownership, rehabilitation, and rental programs as independent strategies that are in conflict with one another over scarce funding. In contrast to this view, Beyond Housing understands these strategies to be complementary to one another, as components of a larger asset-building model for revitalizing communities (see for e.g., Krehmeyer and Harness, 2007). Therefore, in our analysis, we not only examine how each asset strategy impacts housing prices independently,

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<sup>3</sup> The community being studied in this paper does not have a local school.

but the combined impact of these strategies on housing prices as a first step toward identifying the important components of an asset model of community revitalization.

### **Research Method and Data**

This study conducts two different analyses on residential property sales in order to explore the progressive impact of Beyond Housing's asset-building model in Pagedale since 1999. The first analysis compares property sales in Pagedale to sales in other areas of the Normandy School District, a wider area comprising about 39,000 residents. The second analysis follows the first set of results, comparing residential property sales within 150 feet of a Beyond Housing investment to those located further away. Both analyses utilize hedonic price modeling methods, which look at sales prices as a function of housing characteristics and location characteristics, including the spatial proximity of new investments. Data used for the analysis includes the location and Beyond Housing's investments (by address), St. Louis County Assessor data, and block-level population data from the 2000 census.

At first cut, the analysis looks at Pagedale's sales values in the context of sales in the Normandy School District. The Normandy School District is located in the north/middle county area along the border of the city of St. Louis. It comprises some 19 smaller municipalities like Pagedale, as well as pockets of unincorporated St. Louis County. The decision reflects a number of issues. First, the size of the district is sufficiently large to provide a number of cases for analysis. Unlike a comparison between Pagedale and St. Louis County as a whole, the school district shares some underlying demographic similarities, facilitating both a straightforward trend analysis and reducing the number of controls that would have to be used to complete a more robust analysis. Both Pagedale and the Normandy School District as a whole are majority African-American and primarily low and moderate income areas. Comparing Pagedale to the school district instead of one or a small number of municipalities reduces the likelihood that an underspecified model would fail to include some features that make the comparison municipalities unique. Finally, there is anecdotal evidence to suggest that school districts are a strong predictor of a household's residential choice (see for e.g., Shapiro, 2004). Completing the analysis within this geographic scale provides a set of cases that result from fundamentally similar processes.

### **Beyond Housing's Asset-Building Program in Pagedale, MO**

Pagedale serves as a case study for using asset building as the centerpiece for community revitalization in a largely African-American, high-poverty, inner ring suburban municipality. Pagedale is located in St. Louis County in a mid-county area adjacent to the boundary of the City of St. Louis, the region's central city. Beyond Housing, a non-profit service and housing provider, first began working in Pagedale in 2000 at the request of local municipal officials. In 2001, the organization helped local leaders and residents to create a Community Action Plan, with a set of broad goals and specific strategies to make improvements in the area's housing, increase community input in local governance, reduce crime and nuisance problems, improve programs for families and youth, and create new economic development opportunities.

Since that point, Beyond Housing has leveraged a host of additional investments in the community, including new facilities such as parks and community spaces, technical and organizing assistance to neighborhood groups, neighborhood cleanups and beautification campaigns and social services oriented towards families and youth. Each of these investments has been a part of the organization's long-term commitment and desire to work comprehensively in the municipality. More specific to this study, Beyond Housing's housing-related strategies have included a rental housing production program, the development of for-sale housing, and provision of repair grants to existing homeowners.

For this analysis, Beyond Housing provided data concerning the resources it has leveraged to improve housing in Pagedale. The most prominent of this work has been direct investments in rental housing, shown in Table 1.



Table 1: Beyond Housing's Rental Projects, 2000 to 2007  
Pagedale, MO

Completion Date	Address	Amount Invested	Type of Unit	Project Type
2/28/2001	1280 Purcell	\$97,000	Single Family	New
2/28/2001	1278 Purcell	\$97,000	Single Family	Rehab
3/1/2001	1333 LeRoy	\$97,000	Single Family	New
3/7/2001	1321 LeRoy	\$97,000	Single Family	New
3/28/2001	1318 Milford	\$97,000	Single Family	New
3/29/2001	6711 Schofield	\$97,000	Single Family	New
3/30/2001	1330 LeRoy	\$97,000	Single Family	New
3/30/2001	1336 Milford	\$97,000	Single Family	New
4/23/2001	1503 Faris	\$97,000	Single Family	New
5/31/2001	6992 Robbins	\$97,000	Single Family	New
8/11/2003	6766 Roberts	\$117,000	Single Family	New
9/11/2003	6727 Raymond	\$117,000	Single Family	New
9/18/2003	1342 Kingsland	\$117,000	Single Family	New
9/22/2003	6558 Joseph	\$117,000	Single Family	New
9/22/2003	6731 Robbins	\$117,000	Single Family	New
9/29/2003	6507 Joseph	\$117,000	Single Family	New
9/29/2003	6621 Raymond	\$117,000	Single Family	New
10/31/2003	1338 Belrue	\$117,000	Single Family	New
10/31/2003	1340 Belrue	\$117,000	Single Family	New
11/21/2003	6723 Raymond	\$117,000	Single Family	New
11/21/2003	6725 Raymond	\$117,000	Single Family	New
11/21/2003	6763 Raymond	\$117,000	Single Family	New
12/17/2003	6563 Joseph	\$117,000	Single Family	New
12/17/2003	6569 Joseph	\$117,000	Single Family	New
12/17/2003	1346 Kingsland	\$117,000	Single Family	New
12/31/2003	1229 Sutter	\$117,000	Single Family	New
1/8/2004	1322 Ferguson	\$117,000	Single Family	New
1/1/2005	6519 Julian	\$80,000	Single Family	Rehab
1/1/2006	1527 Engelholm	\$80,000	Single Family	Rehab
1/1/2007	1323 Kingsland	\$80,000	Single Family	Rehab
1/1/2007	6751 Roberts	\$80,000	Single Family	Rehab
1/1/2007	1545 Salerno	\$80,000	Duplex	Rehab
10/27/2007	6703 Roberts	\$56,286	Single Family	Rehab
Under Construction	1324 Belrue	\$134,810	Single Family	New
Under Construction	6539 Julian	\$114,820	Single Family	New
Under Construction	6816 Primrose	\$145,254	Single Family	New
Under Construction	6622 Raymond	\$142,600	Single Family	New
Under Construction	6747 Roberts	\$138,725	Single Family	New
Under Construction	1219 Gregan	\$120,882	Single Family	New
Under Construction	6735 Schofield	\$137,772	Single Family	New
Under Construction	6737 Shofield	na	Single Family	New
Under Construction	6506 Joseph	\$132,240	Single Family	New
Under Construction	1327 Kingsland	\$147,772	Single Family	New
Under Construction	1319 Belrue	\$112,810	Single Family	New
Under Construction	6524 Whitney	\$155,215	Single Family	New
Under Construction	6700 Schofield	\$144,372	Single Family	New
Under Construction	6618 Raymond	\$135,580	Single Family	New
Under Construction	6749 Roberts	\$138,725	Single Family	New
Under Construction	1314 Colby	\$134,810	Single Family	New
Under Construction	6722 Schofield	\$130,560	Single Family	New
Under Construction	6620 Raymond	na	Single Family	New
Under Construction	1340 Woodruff	\$134,810	Single Family	New
Under Construction	1325 Kingsland	\$147,772	Single Family	New
Under Construction	6571 Julian	\$132,772	Single Family	New

The inventory of projects includes 32 completed since 2001, with another 21 under construction in 2007. The completed projects represent a total of \$3.3 million invested, with another \$2.6 million planned for 2007. While most of the projects have been new construction, Beyond Housing has also completed a small number of rehabs that were a part of their rental inventory. Beyond Housing’s rental investments peaked in 2003, with a total of nearly \$2 million invested in seventeen new, single family homes. Beyond Housing’s new phase of rental housing – 21 single family homes under the Mary Louise Estates project – will represent a slightly higher figure at \$2.6 million.

Another portion of Beyond Housing’s investments in Pagedale have comprised redevelopment of for-sale housing, shown in Table 2.

Table 2: Beyond Housing's For Sale Projects, 2000 to 2007  
Pagedale, MO

Completion Date	Address	Amount Invested	Type of Unit	Project Type
2000	1287 PURCELL	\$50,000	Single Family	New
2000	3 WHITNEY	\$76,717	Single Family	New
2000	6743 ROBERTS	\$66,787	Single Family	New
2000	6778 ROBBINS	\$71,325	Single Family	New
2000	7002 ROBBINS	\$70,915	Single Family	New
2001	6532 WHITNEY	\$71,325	Single Family	New
2001	6700 RAYMOND	\$11,500	Single Family	Rehab
2001	6708 RAYMOND	\$71,000	Single Family	New
2001	6710 ROBBINS	\$71,325	Single Family	New
2001	6730 ROBERTS	\$71,325	Single Family	New
2001	6732 SCHOFIELD	\$109,900	Single Family	New
2001	6741 ROBERTS	\$109,475	Single Family	New
2001	6748 SCHOFIELD	\$70,915	Single Family	New
2002	1205 BELRUE	\$85,542	Duplex	Rehab
2003	1216 VERL	\$9,190	Single Family	Rehab
2003	6700 ROBBINS	\$61,631	Single Family	Rehab
2004	6533 JOSEPH	\$54,131	Single Family	Rehab
2004	7013 ROBBINS	\$90,000	Single Family	New
2005	1347 FERGUSSON	\$114,119	Single Family	Rehab
2005	1521 BRADFORD	\$111,000	Single Family	New
2005	1538 PURDUE	\$124,000	Single Family	New
2005	6511 WHITNEY	\$130,000	Single Family	New
2005	6523 JOSEPH	\$115,000	Single Family	New
2005	7017 ROBBINS	\$118,000	Single Family	New
2005	7101 ROBBINS	\$113,327	Single Family	New
2005	7414 PAGE	\$80,059	Single Family	Rehab
2006	6809 ROBBINS	\$115,045	Single Family	New

These projects generally have involved either Beyond Housing taking ownership or development of the housing or working with a for-profit development partner. Like the rental projects, these for-sale developments have emphasized new, single-family construction. Since 2000, Beyond Housing has invested a little over \$2.1 million in for- sale developments. For new units, the

average investment has a little over \$92,000; the cost of new projects has gradually increased over the period. A significant amount of for-sale development, including new construction, preceded Beyond Housing's major rental investments in 2003 and 2004; a second peak of for-sale development – a little over \$900,000, most of it new construction – also occurred in 2005. There has been little new for-sale development sponsored by Beyond Housing since 2005.

The third portion of Beyond Housing's real estate program for Pagedale has been repair grants to existing homeowners, shown in Table 3.

In contrast to rental or for-sale housing production, repair projects are much smaller, on average about \$4,300. Beyond Housing has funded 50 repair projects since 2000. The total dollar amount of repair grants peaked in 2003, at just over \$85,000, with the amount of grant funding falling since that point. Beyond Housing is currently implementing another round of repair grants – a total of \$400,000 funded by the Federal Home Loan Bank for 50 homes. The projects should be completed by May of 2008.

Beyond Housing's rental and for-sale housing initiatives primarily took advantage of vacant residential property owned by the City of Pagedale or purchased by Beyond Housing as a part of the site acquisition process. In this sense, the projects have tended to be concentrated in certain subdivisions in the southern portion of the municipality. By contrast, repair grants have been broadly distributed across Pagedale. This clustering complicates the analysis, because Beyond Housing's for-sale investments, as predictor values of sales prices, will not be included in the hedonic modeling and, in areas where the for-sale investments cluster, there will be relatively few sales to estimate impact.

Table 3: Beyond Housing's Repair Projects, 2000 to 2007  
 Pagedale, MO

Completion Date	Address	Amount Invested	Funding Source
2001	1321 Woodruff	2450	CDC
2001	1323 Milford	1580	CDC
2001	1531 Faris	1500	United Way
2001	1542 Faris	3200	United Way
2001	6838 McNamee	4440	United Way
2002	1212 Verl	2300	United Way
2002	1219 Buckner Place	2100	United Way
2002	1268 Kingsland	2680	CDC
2002	1327 Colby	2965	CDC
2002	1348 Belrue	5000	CDC
2002	1348 Belrue	500	CDC
2002	1408 Leroy	2894	CDC
2002	1471 70th Street	600	CDC
2002	1606 Bradford	2205	CDC
2002	1647 Quendo	1354	CDC
2002	1818 Engleholm	1000	CDC
2002	1834 Engelholm	600	CDC
2002	1866 Engelholm	1600	CDC
2002	6509 Joseph	2400	CDC
2002	6720 Robins	4354	CDC
2002	6751 Schofield	4150	CDC
2002	6840 McNamee	203	CDC
2002	7122 Eltora	4197	United Way
2002	7345 Grand	1738	CDC
2003	1322 Milford Avenue	7500	HUD
2003	1326 Leroy Avenue	8080	HUD
2003	1351 Woodruff	8500	HUD
2003	1471 70th Street	5025	HUD
2003	1476 70th Street	7000	HUD
2003	1482 Ferguson	5750	HUD
2003	1546 Faris	7886	HUD
2003	1602 Purdue	9000	HUD
2003	1801 Engelholm	9150	HUD
2003	6739 Robbins	2923	United Way
2003	6746 Roberts	7175	HUD
2003	6841 McNamee	7000	HUD
2003	7355 Grand Drive	1500	United Way
2004	1213 Gergan Place	6581	HUD
2004	1217 Bucker Place	7000	HUD
2004	1271 Gruner	3365	HUD
2004	1278 Kingsland	7705	HUD
2004	1440 Farris	6000	HUD
2004	1471 Engelholm	5000	HUD
2004	1834 Engelholm	8295	HUD
2004	1851 Engelholm	8400	HUD
2004	1866 Engelholm	7000	HUD
2004	6720 Page	3610	HUD
2004	6840 McNamee	4000	HUD
2004	7520 Page	4700	HUD
2006	1211 Gegan Place	3980	HUD

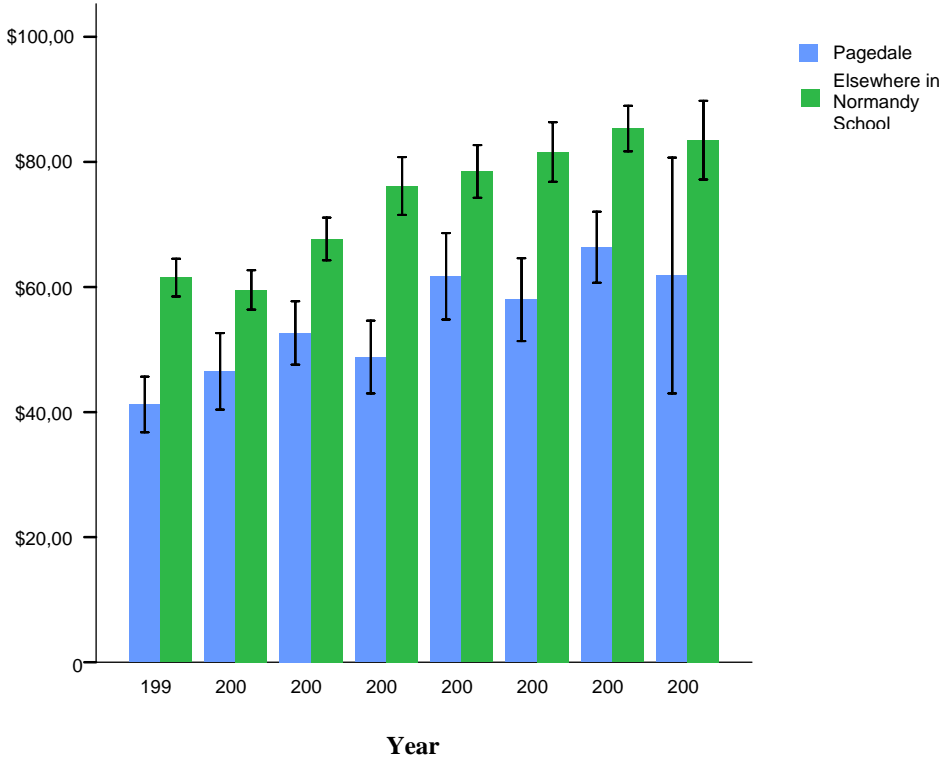
Map 1: Location of Beyond Housing Investments  
Pagedale, MO



### Analysis of Pagedale Sales within the Normandy School District

One point of similarity between Pagedale and the Normandy School District as a whole is that both have similar overall trends in residential property sales<sup>4</sup> over the period of interest, shown in Chart 1.

Chart 1: Sales Price Trend, Pagedale and Normandy School District



Bars show 95% confidence interval around the mean.

While average sales prices elsewhere in the Normandy School District are much higher than average sales prices for Pagedale, the data shows that average sales prices are increasing for both areas, with a marginally greater rate of increase for Pagedale over the seven years. The linear trend for sales price in Pagedale is .211 compared to .062 for the rest of the Normandy School District. The fact that average sales prices are rising in Pagedale does not explain which factors are causing those increases. In this sense, we attempt a more robust analysis of sales prices by creating a hedonic price model, specifying residential property sales as a function of characteristics of the sales location and the residential property. As predictor variables, the

<sup>4</sup> The analysis uses property sales for residential property, excluding multi-family parcels (more than two units), industrial or commercial property or vacant land. The analysis also excludes property sales made under trustee deeds, including foreclosures and sales of less than \$1,000. Under this definition, there were a total of 3024 sales in the Normandy School District and 207 in Pagedale from 1999 through 2006. For the Pagedale sales, the database does not include any sale of property developed by Beyond Housing under their for-sale development program.

model includes as the dependent variable the sale price of residential properties. Predictor variables include a series describing the characteristics of the property, including:

- Age of the Property (in years)
- Square of the Age of the Property (capturing non-linear effects of age)
- Square Feet of Residence
- Square Feet of Parcel
- Total Number of Stories
- Total Number of Bedrooms
- Total Number of Bathrooms
- Presence of Air Conditioning

The model includes a number of factors capturing location characteristics, including

- Distance from Commercial Property (in miles)
- Population Density of Property's Block Group
- Percent Owner-Occupied Housing in Property's Block Group.

The model also includes a series of variables (yes/no) on the municipal location of the property in order to capture any additional neighborhood effects.

Finally, the model includes a series of categorical variables detailing whether the sales were in Pagedale in a particular year (1999 through 2006). For each of these Pagedale/Year interaction terms, the analysis provides an estimate of the impact in dollar terms. These estimates can be seen as a premium for the price of Pagedale residential property, when compared to all sales in the Normandy School District, controlling for other factors.

The model results indicate that an adjusted R-squared of .734, suggesting a reasonably good model fit. Table 4 shows the model results.

Table 4: Model Results for the Hedonic Price Model of Normandy Sales

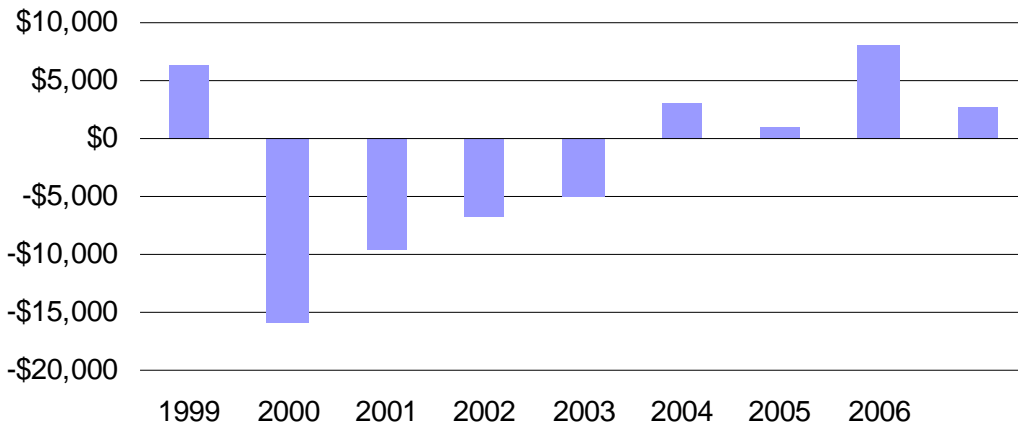
	Coefficients	T-Score	Significance
Constant	6267.988	1.72	<b>0.086</b>
Pagedale/1999	-15867.019	-4.51	<b>0.000</b>
Pagedale/2000	-9607.021	-2.70	<b>0.007</b>
Pagedale/2001	-6727.656	-1.82	<b>0.068</b>
Pagedale/2002	-5017.835	-1.26	0.207
Pagedale/2003	2994.759	0.70	0.486
Pagedale/2004	943.735	0.21	0.830
Pagedale/2005	8105.848	2.62	<b>0.009</b>
Pagedale/2006	2721.909	0.31	0.754
Age	74.550	2.28	<b>0.022</b>
Age Squared	-0.031	-1.91	<b>0.056</b>
Square Feet of Residence	29.360	19.45	<b>0.000</b>
Square Feet of Parcel	0.604	4.93	<b>0.000</b>
Number of Stories	-574.779	-0.42	0.675
Number of Bedrooms	-483.743	-0.78	0.434
Number of Bathrooms	3484.809	2.92	<b>0.004</b>
Air Conditioning	621.797	0.79	0.429
Distance to Commercial Property	4.105	4.07	<b>0.000</b>
Population Density (BG)	-0.425	-3.62	<b>0.000</b>
Percent Owner Occupied (BG)	156.049	5.64	<b>0.000</b>

*Municipal controls not shown.  
R-squared: .734 F: 200.992 (Sig. .000)  
Bolded coefficients are significant at p<.10*

Most of the predictors perform in the direction as expected. Older, larger properties have higher sales values, as do residences with more bathrooms and larger lot sizes. Other property characteristics are statistically significant predictors. Property values increase in areas further away from commercial properties, with more owner-occupied housing and lower population densities. Most importantly, the Pagedale/Year interactions terms also suggest a trend from negative to positive across the time frame studied, shown in Chart 5.



**Chart 2: Pagedale Price Premium, by Year**



*Coefficients significant for 1999, 2000, 2001, 2005*

The chart shows a linear trend in price premium, from negative in 1999 and 2000 to positive in 2003 and beyond. The premium peaks in 2005, the last major year of Beyond Housing’s for-sale program. As the sales database does not include property developed by Beyond Housing under the for-sale program, this trend suggests a short-term and intermediate impact in Pagedale, although the impact declines after a year or so. It should be noted that the terms are significant only for 1999, 2000, 2001, and 2005, This is probably due to the number of sales in each year.

**Analysis of Spillover Effects in Pagedale**

The results from the Normandy School District suggest that, while residential property sales in Pagedale are on average lower than elsewhere in the district, there is a positive price premium for Pagedale properties in the last few years, a reversal of the negative price premium from 1999 through 2001. Making a second argument that these price premiums result from Beyond Housing’s asset-building activities requires further inquiry. In the second stage of the analysis, we define an impact zone around Beyond Housing’s investment sites, characterizing residential sales on the basis of those zones, and estimate a hedonic price model, using a similar set of predictors to the Normandy School District model, restricted to the smaller sample of Pagedale sales only. In this case, the model includes a series of interaction terms indicating whether the sale is located within a 150-foot buffer from a Beyond Housing investment by project types by the year of the sale. Testing for a spillover effect means determining whether sales prices, controlling for everything else that might impact property sales, are higher within the buffer than outside of it; the interaction terms provide a coefficient that can be translated into a premium for property located within these impact zones over the seven-year period.

As noted above in the discussion of previous research, the model is restricted in its ability to adequately measure the temporal effects because Beyond Housing's investment data does not include beginning and end dates for all projects. Following Schill, Ellen, Schwartz, and Voicu (2002), we could create interaction terms relating to both spatial buffers and temporal lags around the investment date. Using the interaction terms without dates introduces a level of uncertainty into the analysis by assuming a relatively uniform pattern of investment across the seven year period. This uncertainty is diminished somewhat because of the geographic clustering of the two most prominent portions of Beyond Housing's work – rental housing production and development of for-sale housing.

The model returns a series of coefficients per investment type per year that measure a premium for the price of Pagedale residential property within the 150-foot buffer when compared to other residential sales in Pagedale, controlling for other factors. Table 5 shows the model results.

With an R-squared of .311, the Pagedale model performs somewhat less well than the Normandy model, in part due to the small number of observations of property sales. Indeed, the predictors for the impact of the rental and for-sale investments in 2006 drop out because these values are constants. There are also a somewhat different set of results for the standard location and property characteristics predictors than the Normandy model; for example, while larger properties have higher sales values, the age of the property works in the opposite direction, with both findings statistically significant. Only the square feet of the residence and distance to commercial property are statistically significant predictors; the other variables shared with the Normandy model are not significant.

Table 5: Model Results for the Hedonic Price Model of Pagedale Sales

	Coefficients	T-Score	Significance
Constant	59069.110	4.62	<b>0.000</b>
Repair Buffer Sale in 1999	-10811.898	-2.14	<b>0.034</b>
Repair Buffer Sale in 2000	-13295.469	-2.80	<b>0.006</b>
Repair Buffer Sale in 2001	-8190.262	-1.71	<b>0.090</b>
Repair Buffer Sale in 2002	-996.571	-0.21	0.834
Repair Buffer Sale in 2003	-2211.325	-0.40	0.686
Repair Buffer Sale in 2004	-5425.443	-0.87	0.386
Repair Buffer Sale in 2005	5032.454	1.27	0.207
Repair Buffer Sale in 2006	-539.409	-0.07	0.941
Rental Buffer Sale in 1999	-14533.497	-2.74	<b>0.007</b>
Rental Buffer Sale in 2000	428.468	0.07	0.944
Rental Buffer Sale in 2001	4695.289	0.67	0.505
Rental Buffer Sale in 2002	-8705.362	-1.67	<b>0.097</b>
Rental Buffer Sale in 2003	-3700.117	-0.55	0.585
Rental Buffer Sale in 2004	-4254.094	-0.39	0.698
Rental Buffer Sale in 2005	3766.663	0.69	0.492
For Sale Buffer Sale in 1999	-18226.042	-3.05	<b>0.003</b>
For Sale Buffer Sale in 2000	-20742.197	-2.24	<b>0.026</b>
For Sale Buffer Sale in 2001	-9680.414	-1.21	0.228
For Sale Buffer Sale in 2002	-175.185	-0.03	0.979
For Sale Buffer Sale in 2003	14652.912	1.82	<b>0.070</b>
For Sale Buffer Sale in 2004	9373.513	1.18	0.240
For Sale Buffer Sale in 2005	9682.916	1.56	0.121
Age	-609.865	-2.13	<b>0.035</b>
Age Squared	4.330	1.91	<b>0.058</b>
Square Feet of Residence	27.398	4.83	<b>0.000</b>
Square Feet of Parcel	0.023	0.05	0.961
Number of Stories	-3596.394	-0.69	0.489
Number of Bedrooms	-13.516	-0.01	0.994
Number of Bathrooms	-4298.345	-1.16	0.247
Air Conditioning	-1356.394	-0.54	0.593
Distance to Commercial Property	7.400	1.75	<b>0.083</b>
Population Density (BG)	-0.282	-0.80	0.427
Percent Owner Occupied (BG)	-55.649	-0.68	0.499

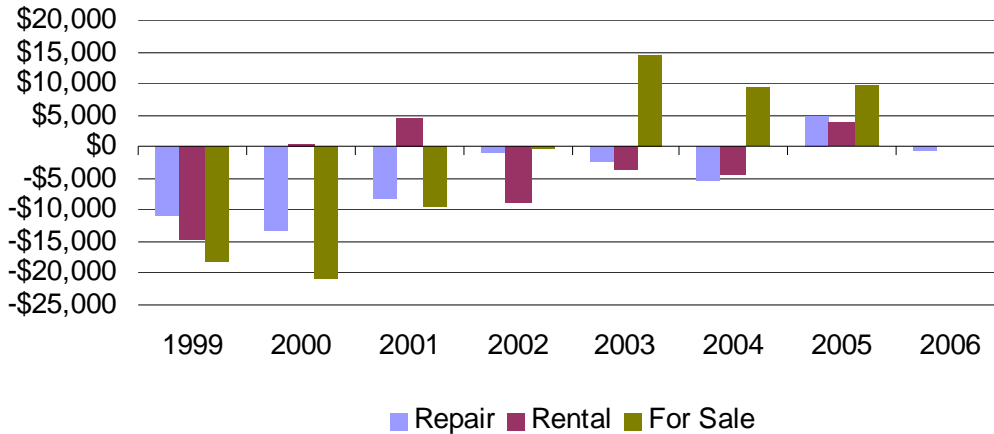
*Municipal controls not shown.*

*R-squared: .311 F: 3.734 (Sig. .000)*

*Bolded coefficients are significant at  $p < .10$*

Most importantly, the buffer interaction terms for the various project types show a general increasing linear trend for price premiums around the various investment sites over the seven-year period, shown in Chart 3.

**Chart 3: Price Premiums, 150' Buffers, by Year**



*Repair coefficients significant for 1999, 2000, and 2001; Rental coefficients significant for 1999; and For Sale coefficients significant for 1999, 2000 and 2003.*

It should be noted that in most cases, particularly in more recent years, these coefficients are not statistically significant. The linear trend is strongest in relation to for-sale housing development, with a significant, positive price premium of \$15,000 in 2003. By contrast, there appears to be little evidence that rental housing significantly impacts property values – positively or negatively. The findings for repair grants indicate a mixed bag, with negative, significant coefficients early in the study period and positive, insignificant results in later years.

**Conclusion**

The results of the sales price analysis suggest that there is a temporal trend of increasing sales prices in Pagedale that could be associated with Beyond Housing’s investments. When compared to other residential property in the Normandy School District, average sales prices in Pagedale are increasing at a faster rate over the 1999 to 2006 period, although average sales prices are significantly lower. As noted in the literature review, it is not uncommon for housing prices in distressed neighborhoods to lag behind other areas as a result of systematic differences in neighborhoods (Schill, Ellen, Schwart and Voicu, 2002).

The findings for the first hedonic price model, comparing sales for Pagedale residential property to property elsewhere in the Normandy School Districts, clarifies these trends, showing that, when the analysis controls for other factors that might influence sales prices, Pagedale housing has a premium over other residential property in the school district which is negative in 1999 and

2000 but becomes positive after 2003. However, there is no conclusive evidence that these price premiums are directly related to Beyond Housing's investments. Results from the second hedonic price model of Pagedale sales lack the certainty of the Normandy model, showing a positive linear trend for properties located 150 feet from investment sites but largely coefficients on the premiums that lack significance. The strongest case can be made for for-sale housing development; however, positive findings after 2003 are not statistically significant. In one sense, the rising sales prices of Beyond Housing's for sale developments—from \$50,000 and \$60,000 in 2000 to \$130,000 by 2005—appear to have influenced the increased sales prices of adjacent properties. By contrast, there appears to be little spillover effect of rental projects. To state the role of rental housing in slightly more positive terms, the analysis finds no support for a negative impact. In the main, Beyond Housing has pursued the sort of rental housing strategy that scholars suggest is least likely to negatively impact housing prices, although they are working in the type of low-income area where past research has found negative effects. Likewise, there seems to be little support for the positive impact of repair grants. One reason might be because of the relatively small amounts of the grants in this study.

In conclusion, the sort of analysis undertaken here might be an appropriate tool to enhance the evaluation and understanding of asset-building programs and community revitalization work undertaken by community actors. Though it requires relatively specific local data and a modicum of mapping and analytical skills, hedonic price modeling and other associated techniques are useful methods for measuring community impact in a manner that has not been traditionally employed in the evaluation of community work. While the case of Pagedale perhaps provides the smallest number of cases necessary for the analysis to be significant, even its relatively limited sample of sales provides enough information to determine the largely positive impact of Beyond Housing's work and, by extension, its overall community revitalization efforts.

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