The Impacts of Targeted Public and Nonprofit Investment on Neighborhood Development

Research based on Richmond, Virginia's
Neighborhoods in Bloom Program

Community Affairs Office of the Federal Reserve Bank of Richmond

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In recent decades, American cities have expended considerable resources on housing and community development efforts in deteriorated neighborhoods. However, they generally have not targeted the critical mass of such resources at particular neighborhoods necessary to bring them to the point where private housing and commercial markets begin to operate without government funds. Instead, resources are spread somewhat thinly throughout low- to moderate-income neighborhoods, helping each one a little, but not curing any.

In 1999, the City of Richmond, Virginia, decided to target the bulk of its federal Community Development Block Grant (CDBG) funds and its Home Investment Partnership (HOME) funds, as well as significant amounts of capital improvement funds and other resources (focused code enforcement and accelerated vacant and abandoned property disposition) on just seven, carefully chosen neighborhoods. Through this initiative, called Neighborhoods in Bloom (NiB), the city planned to concentrate significant resources on these neighborhoods until it achieved the critical mass of public investment needed to stimulate self-sustaining, private-market activity there. At the same time, the Richmond office of the Local Initiatives Support Corporation (LISC), acting through Richmond's community development corporations (CDCs), targeted its housing investment subsidies (lines of credit, loans and grants) largely to the same neighborhoods.

This study assesses the impacts of these efforts after five years, using both quantitative and qualitative methods. The quantitative method used here is an adjusted interrupted time series (AITS) model, which compares home sales prices in the targeted neighborhoods with prices in neighborhoods that were not targeted for public subsidies, from 1990 (nine years before the NiB program's initiation) through 2003 (almost five years after the program's initiation). The results of the modeling process are quite clear. Although average home sales prices increased at a healthy clip citywide after 1996, they increased 9.9 percent per year faster in the target neighborhoods after the onset of the NiB program than they did elsewhere in the city. In fiscal year 1990/91, home sales prices in the target areas averaged less than half of the citywide average. By FY 2003/04, however, home sales prices in the target areas averaged 70 percent of the citywide price average.

Furthermore, when city investments (of the type that are the focus of this study) in a given block* within the target areas exceeded $20,100, the average home sales price in the block increased by over 50 percent and then continued to increase thereafter. LISC investments are correlated with an additional price increase in blocks where city investments also exceeded $20,100. This strongly suggests the presence of critical thresholds that public and nonprofit investment must exceed if they are to

* Census blocks are areas bounded on all sides by visible features, such as streets, roads, streams, and railroad tracks, and by invisible boundaries, such as city, town, township, county limits, property lines, and short, imaginary extensions of streets and roads. In a city like Richmond, a census block typically consists of an entire square bounded on all four sides by streets. It is not a single block face, but rather four block faces encompassing adjacent land parcels. In measuring distances between two census blocks, or between a census block and a parcel, the block's internal point was used, which is generally determined as the geographic center of the block area.

have measurable impacts on the housing market. Finally, the quantitative modeling process indicates that city and LISC investments in the target neighborhoods may have had positive impacts on home sales prices within 5,000 feet (about one mile) of the target areas as well.

A qualitative analysis of the impacts of the NiB program and LISC investments, consisting of interviews with real estate and finance industry professionals, public officials, nonprofit housing providers and neighborhood residents, largely confirmed the positive picture painted by the quantitative analysis. In a majority of the target neighborhoods, the critical mass of CDBG and HOME funds administered by the city, in addition to funds provided by LISC, allowed most nonprofit CDCs to rehabilitate and construct more housing more quickly than they had done previously. This level of housing activity encouraged – at least in part – private, for-profit developers and investor-owners to begin to rehabilitate dilapidated housing, often in the same blocks where the CDCs were operating. Some private, for-profit housing development activity – both in and near the target neighborhoods – is the result of stimuli other than the city's and LISC's investments. The target neighborhoods contain the only remaining historically significant housing in the city that has not already been renovated and gentrified. Moreover, all of the target neighborhoods are located within close proximity to the central business district (CBD) and most enjoy excellent views or other amenities as well. So some of the differential increase in average home sales prices during the past five years would undoubtedly have occurred even in the absence of the city's NiB program. Still, the City of Richmond's and LISC's investments appear to have made a significant contribution to the appreciation in market value in the target neighborhoods. Available evidence indicates that this has occurred without significant displacement of existing residents. Moreover, by subsidizing homeownership through their investments, LISC and the city have attracted many first-time homebuyers and promoted the goal of creating mixed-income communities.

The results of this study lend support to the notion that the public and nonprofit sectors should target their resources so as to achieve a threshold level beyond which the private market can operate without subsidies (except where they are needed to maintain affordability or to preserve historic structures). Yet to be determined, however, is a definition of neighborhood health sufficiently precise that it could guide local governments in determining both when and how much to invest in a neighborhood, as well as when it is time to declare success and move on to other areas. That task must await further research and further pioneering work by cities such as Richmond.

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We are also very grateful to the people – real-estate developers and appraisers, lenders, public officials, nonprofit community development corporation staff and advocacy group representatives, as well as the neighborhood residents – who gave confidential interviews in which they shared their perceptions of the impacts of targeted public and nonprofit investments in the neighborhoods included in this report.

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INTRODUCTION

This study examines the impacts of targeted investments by the City of Richmond through its Neighborhoods in Bloom (NiB) program and by the Richmond office of the Local Initiatives Support Corporation (LISC) on neighborhood health, measured through home sales prices and other indicators. The NiB program is an ambitious and unusual effort by the City of Richmond to target federal Community Development Block Grant (CDBG) funds and Home Investment Partnership (HOME) funds to a small number of blocks in each of seven neighborhoods so as to achieve a critical mass of public investment that stimulates self-sustaining private market activity. At the same time, the program aims to maintain the historic integrity of the built environment and to maintain affordable housing opportunities for people with a range of incomes.

The city's method of targeting CDBG and HOME investments marks a departure from previous practice in Richmond and, indeed, in most cities in the United States. Typically, cities satisfy federal eligibility requirements by targeting HOME funds to low-income individuals and CDBG funds to low- to moderate-income districts. In practice, this means that cities spread CDBG and HOME funds somewhat thinly among many low-income neighborhoods, responding as much to political pressures from these neighborhoods as to low-income needs. An unfortunate result of this practice is that the critical mass of public investment that may be needed to stimulate self-sustaining private market activity in a neighborhood may never be achieved. In short, in most localities, CDBG and HOME funds serve primarily as tools to ameliorate poor physical conditions, subsidize rents and mortgages for low-income persons, and manage political expectations rather than as tools to revitalize neighborhoods to the point where the local government can declare success and move on to other areas. Why then, did Richmond, an otherwise typical mid-size Southern city, choose to target its CDBG and HOME dollars to a small number of neighborhoods through the NiB program? This is one of the questions addressed by this study.

The city government is not the only party to have focused development resources on low- to moderate-income areas in Richmond in the last several years. The Richmond office of LISC has brought its resources to bear as well, to a large extent in the same neighborhoods that the city targeted for participation in the NiB program. LISC, a national organization with headquarters in New York, was founded by the Ford Foundation 24 years ago to promote community development in America's low-income neighborhoods, primarily through training, technical assistance and financial support of community development corporations (CDCs) operating there. Since opening an office in Richmond in 1990, LISC has targeted its resources to CDCs working in low-income areas in the city and in neighboring counties. Within these areas, targeting has been driven by a variety of factors, not the least of which is the availability of property at low prices. But some CDCs also have chosen areas where their work can have maximum stimulative impact on the private market.

Together, the investments of the City of Richmond and LISC – put in place by nonprofit community development corporations (CDCs) – in the NiB areas are substantial. What has been the impact of these investments? This study presents the results of econometric analyses of the impacts of CDBG, HOME and LISC investments on the market value of houses sold before and after the initiation of targeting, both within and near the targeted neighborhoods. Thus, it examines both the direct impacts of public and nonprofit investment, as well as the induced or stimulative effects on the housing market. In addition to the quantitative analysis, this report also presents a qualitative analysis – the results of interviews conducted with private developers, lenders and appraisers, public officials, nonprofit housing providers, neighborhood residents and academics. Taken together, the quantitative and qualitative analyses show that the Richmond NiB program and LISC's investments produced impressive direct outcomes (a significant number of houses constructed, repaired, renovated and sold – often to first-time homebuyers) in the targeted areas. Public and nonprofit sector targeting also contributed – along with other factors that are unrelated to the public or nonprofit investments – to stimulating the housing market in areas near the target neighborhoods and to maintaining affordable housing options. Before discussing those impacts, a brief description of the NiB program is given.

Acronyms and Abbreviations

RRHA:	Richmond Redevelopment and Housing Authority
SCDHC:	Southside Community Development and Housing Corporation
BHC:	Better Housing Coalition
CBD:	Central Business District
CDBG:	Community Development Block Grant
NiB:	Neighborhoods in Bloom
CDC:	Community Development Corporation
LISC:	Local Initiatives Support Corporation
HOME:	Home Investment Partnership
H.O.M.E. Inc:	Housing Opportunities Made Equal
HPCDC:	Highland Park Community Development Corporation
NHS:	Neighborhood Housing Services of Richmond
ElderHomes:	ElderHomes Corporation
Interfaith Housing:	Interfaith Housing Corporation

WHY TARGET CDBG & HOME FUNDS TO A FEW NEIGHBORHOODS?

Two major considerations convinced the city to target CDBG and HOME funds to a few neighborhoods. First, early in 1998, the city administration responded to staff observations that the previous 25 years of sprinkling CDBG funds across 20 neighborhoods had improved individual blocks or houses, but it had failed to revitalize any neighborhoods to the point where the city could declare its mission accomplished and move on to other areas. The distribution of HOME funds also lacked a strong, overall strategy, other than compliance with HUD's requirements. With strong leadership by the acting city manager and two city council representatives in 1998, the city decided to develop a strategy for concentrating these resources in a few neighborhoods at a time, until a critical mass of public and nonprofit investment had increased property values and thereby attracted for-profit developers and lenders back into the market.

The second major impetus for targeting city resources came from the community's nonprofit housing providers – the CDCs. By the mid-1990s, the CDCs had grown frustrated with the uncertainty surrounding the annual process of applying for CDBG and HOME dollars to support their housing projects. Because the housing predevelopment process requires at least one year – and usually much longer in inner-city areas – the CDCs wanted the city to make a multi-year commitment of resources to a small number of areas so that they could plan acquisition, rehabilitation and new construction more effectively and thus produce more housing.

To make targeting palatable for city councilpersons whose neighborhoods might have to wait while others received CDBG and HOME funds, a rational approach with broad, grassroots support had to be devised. In the summer of 1998, the city administration initiated a data-driven, but also participatory, process to devise a viable targeting approach. First, it established an internal planning task force staffed by the Department of Community Development. The task force consisted of the acting city manager and an assistant city manager, and representatives of the Code Enforcement Division and the departments of public utilities, assessment, economic development and community development. The community development staff identified the indicators of neighborhood condition and development potential for each of the 40 neighborhoods that could potentially receive CDBG or HOME dollars (see sidebar).

Assessment of Neighborhood Condition[1]

- Condition of Structures
  - Vacant – rehabilitate
  - Vacant – demolish
- Criminal Activity
  - Part 1 crimes
  - Hot spots
- Demographics
  - Poverty level
  - Percent of owner-occupied housing

Assessment of Neighborhood Potential

- Neighborhood Capacity for Revitalization
  - Active community groups
  - Neighborhood/conservation/ redevelopment plan
  - CDC/Richmond Redevelopment & Housing Authority Investment
  - Enterprise/empowerment/ commercial area revitalization program
- Market Factors
  - Existing or planned investment
  - Potential for employment
  - Commercial activity or potential
  - Existing or planned services
  - Availability of land
  - On major traffic corridor
  - Proximity to public housing
- Neighborhood Trends
  - Is the neighborhood improving or declining?

[1] "City of Richmond, Neighborhoods in Bloom: Strategy and Discussions CDBG Applicants," Powerpoint presentation by the Richmond Department of Community Development, November 16, 1998. (Footnote for sidebar.)

The factors for neighborhood conditions and revitalization potential were displayed on spreadsheets. The staff used this information to assign each neighborhood to one of four treatment groups:

A: Redevelop: Neighborhood has extensive problems.

a. Neighborhood has high concentration of vacant structures

b. Neighborhood has significant criminal activity

c. Poverty level (greater than 50 percent) is high

d. There is minimal owner-occupied housing

e. There is no neighborhood capacity for revitalization

B: Revitalize: Neighborhood shows significant signs of decline, contains conservation areas, receives numerous federal grants and has houses that can be rehabilitated.

a. Significant number of structures are vacant

b. There is significant criminal activity

c. Poverty rate is 30 percent to 50 percent

d. Some housing is owner-occupied

e. Neighborhood capacity for revitalization is low

f. Neighborhood decline may be recent and swift

C: Stabilize: Neighborhood shows marginal signs of decline; code enforcement issues exist.

a. Some structures are vacant

b. Criminal activity is resilient (attempts to eliminate have been relatively unsuccessful)

c. Twenty to 30 percent of households are at or below the poverty level

d. Owner-occupied housing may be as much as 40 percent to 60 percent

e. Neighborhood may have been in a state of decline for a long time

f. Neighborhood may have had long-term attention in the form of public dollars or planning

D: Protect: Neighborhood has few problems but requires attention to maintain quality of life.

a. No or very few structures are vacant

b. Criminal activity is minimal

c. Owner occupancy is relatively high

d. Poverty rate is relatively low (less than 20 percent)

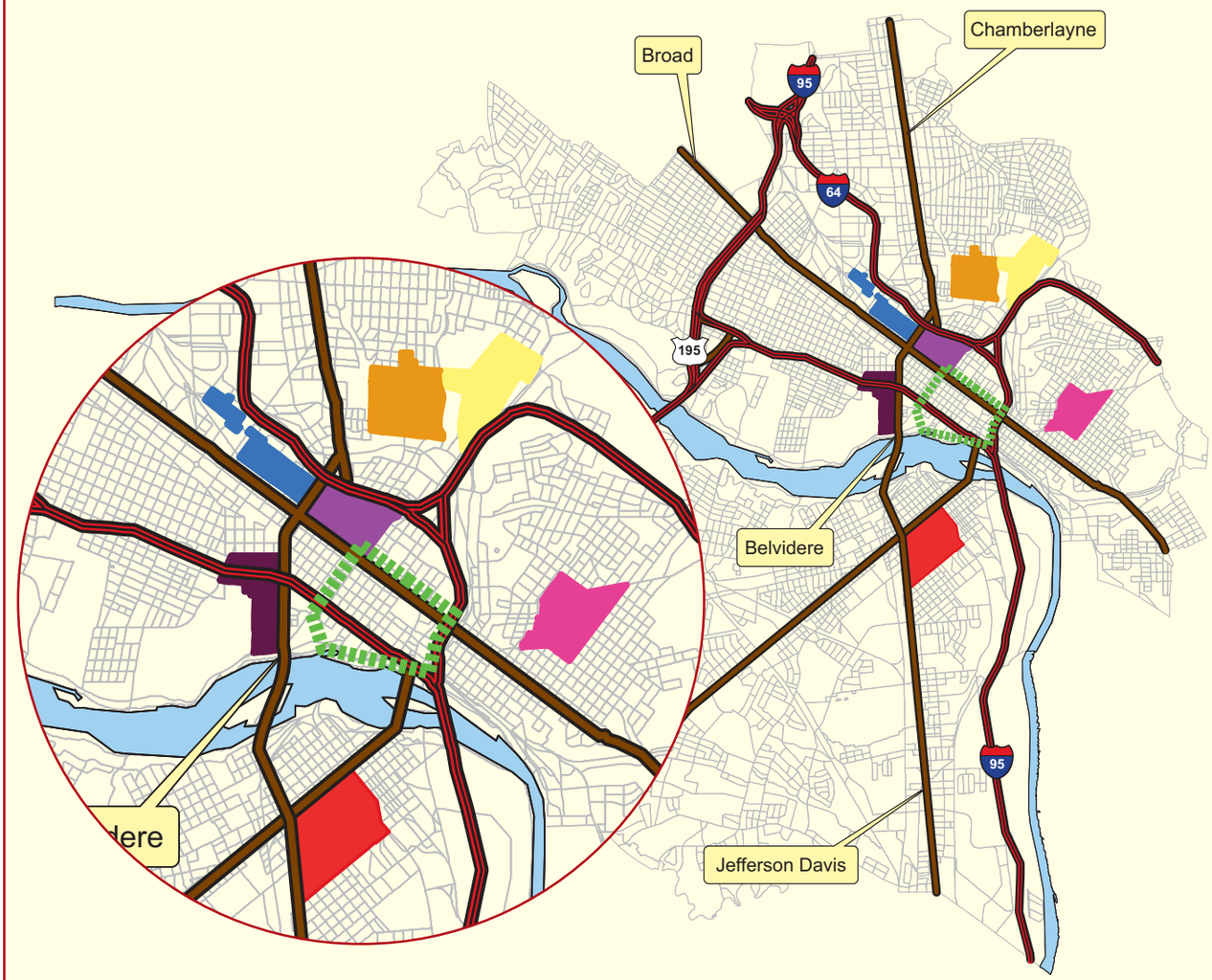
e. Initial signs of decline may be present

The staff recommended that only neighborhoods in groups (A) and (B) be targeted for CDBG and HOME fund assistance.

In the meantime, Community Development Department staff met regularly with two community-based groups to discuss the targeting concept and identify potential neighborhoods and issues. One of these was a community-development industry group and another was comprised of representatives of the city's civic associations. The latter group toured all of the neighborhoods in the city that might possibly be targeted for assistance. By the end of February 1999, there was widespread support for the targeting concept and a rough consensus about which neighborhoods should be targeted, thanks to the city's use of data describing neighborhood conditions and the fact that many neighborhood leaders had toured the areas that most needed assistance. As a result, even communities not directly benefiting from the program came to believe that such an approach was necessary for the good of the city as a whole.

Using the neighborhood conditions data and community-wide input, the community development staff ultimately recommended five neighborhoods for initial participation in the program – Church Hill Central, Southern Barton Heights, Highland Park–Southern Tip, Carver/Newtowne West and Blackwell. The city administration added a sixth – Jackson Ward – which had ranked in a virtual tie with Blackwell on the neighborhood conditions criteria. The city's careful consensus-building process paid big dividends when it came time to approve the selection of the targeted neighborhoods. Of the five councilpersons whose districts include the six target neighborhoods, all supported the program, even though it meant that some parts of their districts would lose CDBG funds. Of the four council districts that did not have a participating neighborhood, two were middle- to upper-income districts. They were unaccustomed to receiving CDBG or HOME funds. However, the councilperson for one of these districts was a key champion of the targeting concept. Of the two remaining districts, one stood to lose CDBG and HOME dollars, and its representative was therefore concerned. His opposition softened after it was agreed that the city would build a new public building to help a struggling neighborhood in his district. Another neighborhood in the district – Oregon Hill – would receive general fund revenues and, after a two-year hiatus, HOME and CDBG funds for housing development, but not other NiB services. Because Oregon Hill received HOME and CDBG funds, as well as significant LISC investment, it is included in this impact analysis with the six NiB areas. In short, the neighborhood targeting idea and the choice of particular neighborhoods for initial participation in the program proved to be sufficiently compelling that they won strong grassroots and city councilperson support (See Map 1).

MAP 1: Neighborhoods in Bloom Target Areas, plus Oregon Hill



NiB Target Areas

- Central Business District
- James River
- Roads
- Census Blocks
- Blackwell
- Carver/Newtowne West
- Church Hill Central
- Highland Park–Southern Tip
- Jackson Ward
- Oregon Hill
- Southern Barton Heights

City Council approved the NiB program in May 1999 and implementation began in FY 2000 (July 1999). Map 1 shows the six NiB areas plus Oregon Hill. The city designated the smaller "impact areas" to receive CDBG and HOME funds and the larger "target areas" that encompass the impact areas to receive priority for certain city services (detailed on page 20). During the five years of the Neighborhoods in Bloom program, the boundaries of the impact areas have grown (often in response to CDC requests), increasing from 931 properties in July 1999 to 1,959 properties in fiscal year 2004.[2] The larger, target area boundaries have remained constant, however. Hence, this study uses only the boundaries of the larger, target areas.

Table 1 on the next page and the tables in Appendix A summarize key features of each of the Neighborhoods in Bloom target areas. Table 1 shows that most of the target areas have higher than citywide percentages of persons in poverty, female-headed households, and vacant and renter-occupied property. (Numbers greater than 1.0 indicate that the neighborhood percentage in this category is higher than the citywide percentage. For example, the percentage of persons under age 18 is 30.1 in Southern Barton Heights, but only 21.8 citywide: 30.1 divided by 21.8 = 1.38.) The target neighborhoods all lie within the older portions of the city. A brief sketch of each neighborhood follows.[3]

[2] David Sacks: *Neighborhoods in Bloom Progress Report and Proposed FY05 Federal Funds Budget Presentation*, April 14, 2004.

[3] This section relies upon the data in Appendix A and on information in RichmondGov.com: "Neighborhoods in Bloom: Bringing back all of Richmond's great neighborhoods," as well as the authors' personal knowledge.

TABLE 1: Concentration of Key Characteristics: Ratio of Target Area Percent to Citywide Percent

	Black	White	Under 18	Over 64	Female-Headed Households	Vacant Property	Renter-Occupied Property	Below Poverty
Blackwell	1.68	0.08	1.50	0.96	1.18	2.77	1.25	1.76
Carver/Newtowne West	1.51	0.29	0.93	0.88	1.23	3.45	1.06	1.37
Church Hill Central	1.64	0.13	1.00	1.50	1.10	2.58	1.19	1.39
Highland Park–Southern Tip	1.71	0.04	1.30	0.88	0.92	2.16	1.05	1.40
Jackson Ward	1.27	0.63	0.76	1.14	1.16	4.02	1.29	1.55
Oregon Hill	0.04	2.39	0.65	0.36	0.60	1.08	1.07	0.81
Southern Barton Heights	1.66	0.10	1.38	0.91	1.15	2.22	1.16	1.16

Sources: Population, age and housing data from Census 2000 SF1 tables; block data provided by Brooke Hardin, City of Richmond; poverty data from Census 2000 SF3; census tract level from City of Richmond Web site.

The numbers in the cells are the results of dividing the neighborhood percentage in the category by the citywide percentage in the category. For example, in Southern Barton Heights, 23.6 percent of the population lives below the poverty level, whereas in the City of Richmond as a whole, 20.3 percent of the population lives below the poverty line. (Appendix A shows these percentages for each neighborhood.) Thus, poverty is slightly more concentrated in Southern Barton Heights than in the city overall. The below-poverty number of 1.16 (23.6 divided by 20.3) for Southern Barton Heights shows this higher concentration of poverty in the neighborhood. Numbers greater than 1.0 show that the characteristic is concentrated in the neighborhood. Numbers less than 1.0 indicate that the characteristic is not concentrated there.

Blackwell, a 150-year-old neighborhood on the southern side of the James River, still has a number of late-19th century Italianate and Victorian-style houses and early 20th century bungalows. It has almost three times the percentage of vacant property as the city as a whole and a poverty rate almost double that of the city as a whole. Until recently, it housed a troubled public housing project, but this is now being replaced by a Hope VI development. (Hope VI is a federal program that enables demolition of obsolete public housing, revitalization of public housing sites and the distribution of supportive services to public housing residents affected by these actions.) Blackwell's housing development organizations include, among others, the Richmond Redevelopment and Housing Authority (RRHA), Housing Opportunities Made Equal (H.O.M.E.) and the Southside Community Development and Housing Corporation (SCDHC).

Carver and Newtowne West are located along the city's major east-west commercial corridor (Broad Street), about one mile west of the heart of the central business district (CBD). The neighborhoods are bordered by Virginia Commonwealth University on the south and I-95 on the north. As of 2000, the neighborhoods' concentration of vacant property was 3.45 (three and one-half times the citywide average) and their combined poverty rate was 1.37 (one-third higher than the city-wide average). Carver and Newtowne West's housing development organizations include RRHA, H.O.M.E. and the Carver Area Civic Improvement League.

Church Hill Central is one of the city's oldest neighborhoods, dating back to 1737. The area has a variety of restored, antebellum brick homes, as well as more modest frame dwellings, representing Federal, Greek Revival and Victorian architectural styles. As of 2000, the neighborhood's vacant property rate was two-and-one-half times that of the city as a whole (2.58) and its concentration of elderly persons (1.5) and persons below poverty (1.39) was also quite high. Church Hill Central's housing development organizations include, among others, the Better Housing Coalition, ElderHomes Corporation, Interfaith Housing Corporation, RRHA, H.O.M.E. and the New Visions Civic Association.

Highland Park–Southern Tip lies just to the north of the CBD. It developed as one of the city's "streetcar suburbs" in the 1890s and still boasts the city's most extensive collection of Queen Anne architecture. It is also characterized by a large concentration of persons under 18 (1.3), a high percentage of persons in poverty (1.42) and a vacant property rate twice that of the city as a whole (2.16). Highland Park's housing development organizations include the Highland Park Community Development Corporation (HPCDC), ElderHomes Corporation, RRHA, H.O.M.E. and the Chestnut Hill Civic Association.

Jackson Ward, located on the northern edge of the CBD, is one of Richmond's most historically significant neighborhoods. Once called the "Harlem of the South" and "The Wall Street of Black America," it still houses many African-American-owned businesses. Although much of the neighborhood was razed to make way for I-95, a

sports and entertainment center, a convention center and other uses, it still boasts many Greek and Georgian Revival, Queen Anne and Italianate houses. Its percentage of vacant property is four times that of the citywide average (4.02); its concentration of rental properties is higher than the city's (1.29); and its poverty rate is considerably higher than the citywide average (1.55). Jackson Ward's housing development organizations include Historic Jackson Ward Association, ElderHomes Corporation, RRHA and H.O.M.E.

Oregon Hill, located between the James River and Virginia Commonwealth University about one mile west of the heart of the CBD, was first settled in the mid- to late 19th century by Scotch-Irish workers at the nearby Tredegar Iron Works and it still retains much of that ethnic character. In the late 1960s, the neighborhood was physically divided by the downtown expressway and it has never completely recovered from that event. Nevertheless, it retains a variety of charming, Victorian housing styles and many small, "vernacular" style houses. Although its percentage of persons in poverty is below the citywide average, the neighborhood has a longstanding commitment to providing housing for moderate-income persons (partly to offset increasing gentrification). For this and related reasons, Oregon Hill has continued to receive investment by LISC and by the city, although it is not formally part of the NiB program. Oregon Hill's primary housing development organization is the Oregon Hill Home Improvement Council.

Southern Barton Heights is located about one mile north of the CBD, just west of Highland Park. It was settled in the late 19th century and features a large collection of Queen Anne, Victorian, American Four-Square and Bungalow houses on tree-lined streets. As of 2000, it still had a vacant property rate more than twice that of the city as a whole (2.22) and a large population of persons under 18 (concentration of 1.38), of whom some lived in female-headed households (concentration 1.15). The poverty rate was also higher than the citywide average (concentration 1.16). Housing development organizations in Southern Barton Heights include Neighborhood Housing Services (NHS) of Richmond, RRHA, H.O.M.E. and the Southern Barton Heights Community Association.

In each NiB target area, the city's community development department organized a team comprised of key stakeholders, including representatives of neighborhood civic organizations, CDCs active in the area, RRHA and others. Each team reviewed existing plans for its area, determined (with guidance from the community development department) the precise boundaries of the "impact area" and developed a two-year work plan and budget. Each work plan included the designation of specific buildings to be acquired and rehabilitated or demolished, and it showed where new housing was to be constructed. The city allocated a portion of its CDBG and HOME funds to each neighborhood based upon its total budget and the neighborhood's plan. Specific housing providers (the CDCs) then applied for funds necessary to build or rehabilitate the houses designated in the plan.

Since the beginning of the program, each team has held monthly or bimonthly meetings with the CDCs working in the neighborhood, as well as with city staff (planners, managers and inspectors) and neighborhood residents. Each team oversees the development process in its neighborhood, reviewing the design of new houses and the renovation of existing houses. In addition, the CDCs, city staff, LISC and private lenders meet on a quarterly basis to discuss neighborhood needs and strategies, and the Richmond Community Development Alliance meets frequently with the city's community development staff and RRHA to discuss technical and policy issues.[4]

City Investments

Between July 1999 (the beginning of FY 99/00) and when the program began in February 2004, the city spent roughly two-thirds of the combined total of its annual CDBG allocation of about $7.5 million and its HOME allocation of about $3.9 million (in addition to other federal and local funds) in the NiB target areas. These dollars funded acquisition, demolition, new construction, and rehabilitation of dilapidated housing in the NiB target areas, down payment assistance and homeownership counseling for first-time homebuyers. The city also spent over $2.7 million in capital improvement funds for streetlights, alleys, sidewalks and street improvements in the NiB areas. Although this is a small portion of the city's capital improvements budget, it is a large percentage of the total funds expended in the NiB areas.[5] Tables 2A and 2B show only portions of these total expenditures – the hard costs that can be attributed to specific street addresses and which were tabulated for the quantitative impact analysis, discussed below. Table 2C shows the number of housing units produced through the NiB program – a significant increase over pre-NiB production levels in these neighborhoods. Since the program began in FY 1999/00, 367 units have been completed and another 24 are underway. Note also the small number of units produced in FY 1997/98 and FY 1998/99, prior to the commencement of the program. Map 2 illustrates where these city neighborhood investments occurred between July 1999 and February 2004.

[4] Interview data, as well as City of Richmond, Virginia: *Consolidated Plan Annual Performance Report,* September 27, 2002, p. 43.

[5] David Sacks: *Neighborhoods in Bloom Progress Report and Proposed FY05 Federal Funds Budget Presentation*, April 14, 2004.

TABLE 2A: Selected City Disbursements on Housing/Community Development Projects in Richmond NiB Target Areas by Fiscal Year

By Funding Source	Actual Costs ($) By Fiscal Year						
	Total	pre 1999/00	1999/00	2000/01	2001/02	2002/03	2003/04
All Funding Sources	13,923,244	198,799	5,734,954	4,083,168	2,257,069	1,324,138	325,116
CDBG	6,250,747	94,949	2,047,266	1,970,369	1,442,680	554,129	141,354
CIP	297,551	–	244,850	29,825	22,876	–	–
General Fund	81,878	–	81,878	–	–	–	–
HOME	4,536,349	15,000	1,962,659	1,326,524	470,067	616,337	145,762
HOME Loan	306,877	20,850	76,027	122,000	10,000	78,000	–
Liberty Mutual Settlement	82,892	–	62,763	20,129	–	–	–
Other Federal Grant	1,104,771	–	783,000	299,000	15,000	7,771	–
Other Federal Loan	200,360	–	–	110,360	90,000	–	–
Owner Contribution	49,852	–	3,155	16,122	13,000	17,575	–
Section 108 Loan	314,786	68,000	164,586	82,200	–	–	–
State Grant	172,595	–	127,495	–	–	45,100	–
Not Specified	524,586	–	181,275	106,639	193,446	5,226	38,000

Source: City of Richmond data compiled by the Urban Institute.

TABLE 2B: Selected City Disbursements on Housing/Community Development Projects in Richmond NiB Target Areas by Fiscal Year

By Activity Type	Actual Costs ($) By Fiscal Year						
	Total	pre 1999/00	1999/00	2000/01	2001/02	2002/03	2003/04
All Activities	13,923,244	198,799	5,734,954	4,083,168	2,257,069	1,324,138	325,116
Acquisition	3,825,722	94,949	1,242,321	923,928	1,072,918	299,752	191,854
Clearance/ Demolition	247,732	–	75,792	81,779	11,661	78,500	–
New Construction	3,453,560	–	1,681,967	1,258,863	164,122	282,384	66,224
Rehabilitation	6,360,162	103,850	2,734,874	1,818,598	1,008,368	663,502	30,970
Not Specified	36,068	–	–	–	–	–	36,068

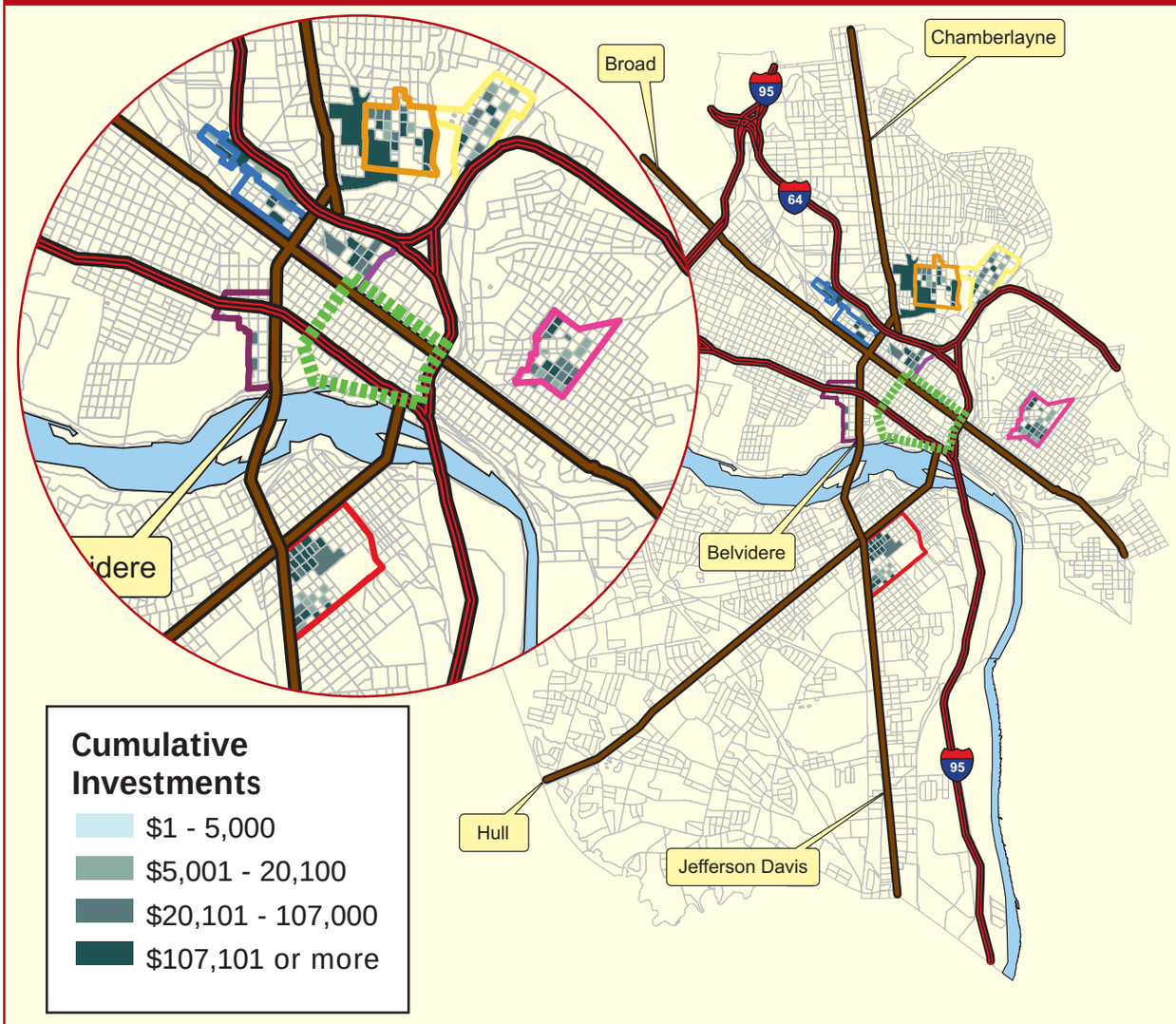
Source: City of Richmond data compiled by the Urban Institute.

TABLE 2C: Number of Housing Units from Housing/Community Development Projects in Richmond NiB Target Areas by Fiscal Year

By NiB Target Areas	Number of Project Units								
		By Fiscal Year Completed							
	Total	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	Not yet completed
All Areas	395	1	3	111	105	65	54	32	24
Blackwell	111	–	–	31	12	24	15	17	12
Carver /Newtowne West	59	–	1	26	17	7	4	–	4
Church Hill	81	1	1	24	35	6	7	5	2
Highland Park	48	–	–	18	22	6	–	–	2
Jackson Ward	31	–	–	1	11	10	5	1	3
Southern Barton Heights	65	–	1	11	8	12	23	9	1

Source: City of Richmond data compiled by the Urban Institute. Data on number of units not available for Oregon Hill.

MAP 2: Selected City Disbursements on Housing/Community Development Projects in Richmond, Va., Fiscal Years 1998/99–2003/04



LISC Investments

Tables 3A and 3B show the nature and magnitude of LISC investments in the City of Richmond since July 1999. LISC provided pre-development, construction, rehabilitation and downpayment assistance, as well as some permanent mortgage financing. Three-fourths of these funds were used for single- and multi-family housing. Map 3 shows the location of LISC's neighborhood investments during the life of the NiB (plus Oregon Hill) program to date. Table 3A and Map 3 show that about one-third of these investments lie outside of the NiB target areas. Also, note that much of LISC's targeted neighborhood investments occurred prior to the start of the NiB program. Throughout the 1990s, most of Richmond's CDCs could access only limited private loan capital because they did not have extensive track records and they were operating in neighborhoods where few comparables could be found to appraise houses. In this environment, LISC was one of the few sources of capital available to CDCs. Without LISC funds as leverage, most CDCs could not raise private capital. By 1999, most of the CDCs had established track records and comparables could be found, even in some NiB areas, so CDCs could often find cheaper and more flexible capital through banks and other private lenders than that provided by LISC. In some neighborhoods, loan-to-value ratios and private lending activity increased.

To illustrate the role of CDBG, HOME and LISC funds in leveraging private funds to revitalize the target areas, Table 4 presents four cases of housing financing in the NiB program. Note the role the RRHA played in acquiring property. As part of the NiB program, the RRHA has focused its acquisition staff on the impact areas, acquiring property through the tax-delinquent sale process, through a negotiated sale from the owner and, occasionally, through eminent domain. In most cases, the RRHA then conveys the property to CDCs operating in the neighborhood, which proceed with development.

TABLE 3A: LISC Disbursements on Housing Projects in Richmond, Fiscal Years 1998/99–2003/04, by NiB Target Areas & Type of Project

By NiB Target Areas/ Type of Project		Disbursement Amount ($)						
			By Fiscal Year					
		Total	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Entire City	All Projects	7,453,776	845,739	1,248,774	1,632,440	2,029,564	1,364,590	332,669
	Commercial	1,774,491	15,000	445,135	254,000	585,500	474,856	–
	Mixed-Use	114,633	–	–	–	–	–	114,633
	Multi-Family	1,846,996	10,000	352,369	646,179	653,448	185,000	–
	Single-Family	3,717,657	820,739	451,270	732,261	790,616	704,734	218,037
Inside NiB Target Areas	All Projects	4,709,858	173,701	1,103,005	768,279	1,223,392	1,141,046	300,435
	Commercial	1,519,991	15,000	445,135	–	585,000	474,856	–
	Mixed-Use	114,633	–	–	–	–	–	114,633
	Multi-Family	623,176	–	285,000	145,000	8,176	185,000	–
	Single-Family	2,452,058	158,701	372,870	623,279	630,216	481,190	185,802
Outside NiB Target Areas	All Projects	2,529,769	457,889	145,769	864,161	806,172	223,544	32,235
	Commercial	254,500	–	–	254,000	500	–	–
	Multi-Family	1,223,820	10,000	67,369	501,179	645,272	–	–
	Single-Family	1,051,450	447,889	78,400	108,982	160,400	223,544	32,235
Not Specified	All Projects	214,149	214,149	–	–	–	–	–
	Single-Family	214,149	214,149	–	–	–	–	–

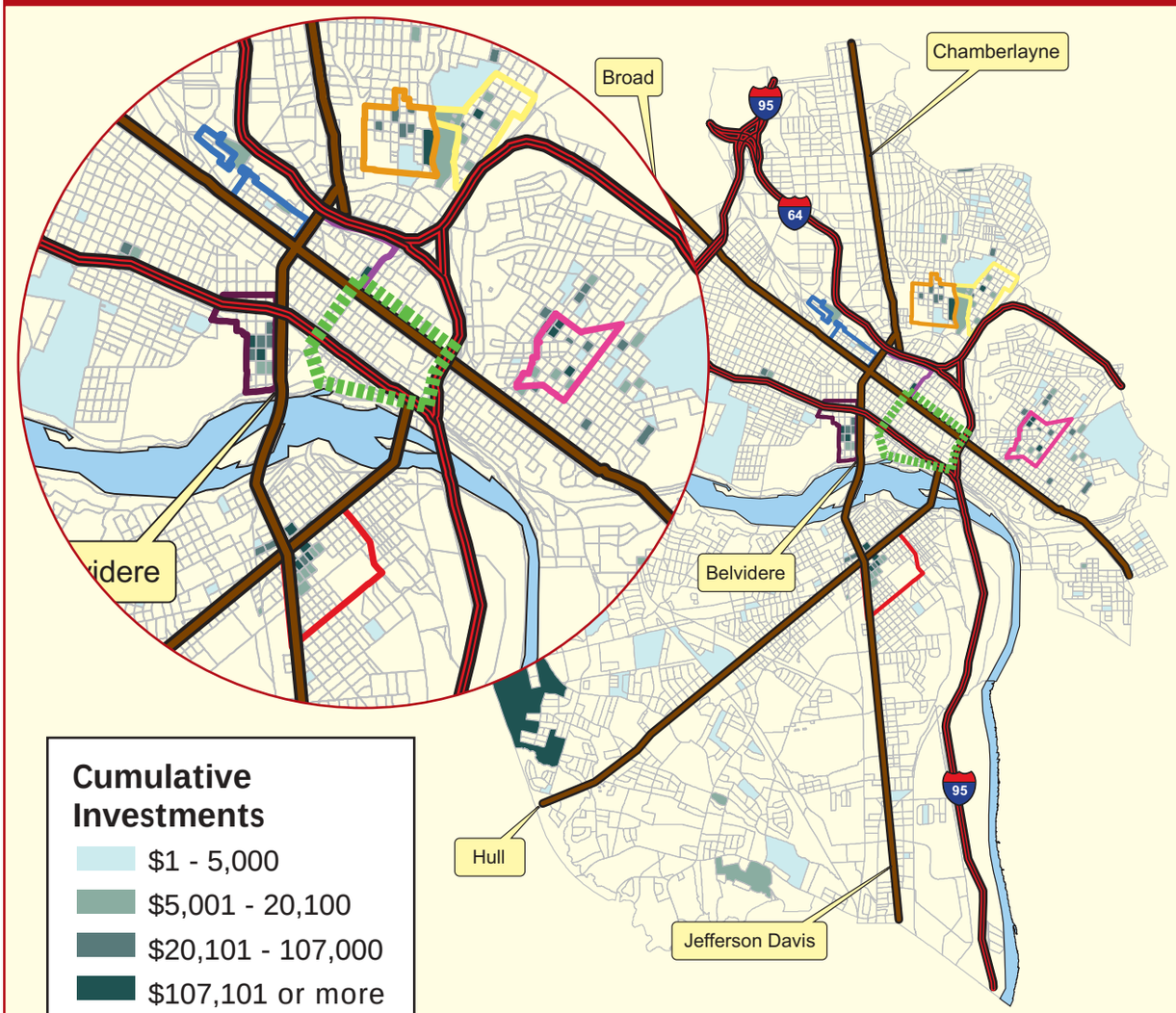
Source: Richmond LISC data compiled by the Urban Institute.

TABLE 3B: LISC Disbursements on Housing Projects in Richmond, Fiscal Years 1998/99-2003/04, by NiB Target Areas & Type of Product

By NiB Target Areas/ Type of Product		Disbursement Amount ($)						
			By Fiscal Year					
		Total	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Entire City	All Products	7,453,776	845,739	1,248,774	1,632,440	2,029,564	1,364,590	332,669
	Line of Credit	1,436,022	388,949	336,870	183,810	287,641	120,000	118,752
	Loan	3,794,739	131,333	712,369	1,229,998	928,273	659,950	132,816
	Program Grant	2,223,015	325,457	199,535	218,632	813,650	584,640	81,101
Inside NiB Target Areas	All Products	4,709,858	173,701	1,103,005	768,279	1,223,392	1,141,046	300,435
	Line of Credit	1,093,774	131,701	336,870	158,810	227,641	120,000	118,752
	Loan	2,161,903	–	645,000	474,819	267,501	659,950	114,633
	Program Grant	1,454,181	42,000	121,135	134,650	728,250	361,096	67,050
Outside NiB Target Areas	All Products	2,529,769	457,889	145,769	864,161	806,172	223,544	32,235
	Line of Credit	342,248	257,248	–	25,000	60,000	–	–
	Loan	1,501,503	–	67,369	755,179	660,772	–	18,184
	Program Grant	686,018	200,641	78,400	83,982	85,400	223,544	14,051
Not Specified	All Products	214,149	214,149	–	–	–	–	–
	Line of Credit	131,333	131,333	–	–	–	–	–
	Loan	82,816	82,816	–	–	–	–	–

Source: Richmond LISC data compiled by the Urban Institute.

MAP 3: Richmond LISC Address-Specific, Hard-Cost Investments, Fiscal Years 1998/99–2003/04



NiB Target Areas

- Central Business District
- James River
- Census Blocks
- Blackwell
- Carver/Newtowne West
- Church Hill Central
- Highland Park–Southern Tip
- Jackson Ward
- Oregon Hill
- Southern Barton Heights

TABLE 4: Neighborhoods in Bloom Project Financing Examples

Activity	Agent	Funding Source	Amount
A: New Housing: One Unit			
Acquisition of Real Property	RRHA	CDBG	$16,000
Clearance & Demolition	RRHA	CDBG	$5,000
Construction of Housing	RRHA	Private Loan	$95,000
B: Rehabilitated Housing: One Unit			
Acquisition of Real Property	RRHA	CDBG	$27,500
Disposition	RRHA	CDBG	$4,000
Rehabilitation	SCDHC	Owner	$1,000
	SCDHC	CDBG	$55,000
	SCDHC	Private Loan	$102,896
C: New Housing: One Unit			
Acquisition of Real Property	BHC	CDBG	$5,000
Construction of Housing	BHC	CDBG	$15,000
	BHC	LISC	$36,000
	BHC	Private Loan	$48,000
	BHC	HOME	$25,000
Homeownership Assistance	H.O.M.E. Inc.	HOME	$3,000
D: Rehabilitated Housing: One Unit			
Acquisition of Real Property	RRHA	CDBG	$1
General Rehabilitation	HPCDC	LISC	$25,000
	HPCDC	Private Loan	$65,000
	HPCDC	HOME	$45,719

RRHA: Richmond Redevelopment and Housing Authority
SCDHC: Southside Community Development and Housing Corporation
BHC: Better Housing Coalition
LISC: Local Initiatives Support Corporation
H.O.M.E. Inc: Housing Opportunities Made Equal
HOME: Home Investment Partnership
HPCDC: Highland Park Community Development Corporation

Source: City of Richmond: *Neighborhoods in Bloom Summary Activity, All Reported Activities*, June 30, 1999, to January 12, 2004.

The city also has focused extra program and staff resources in the NiB target areas. Among these efforts, the most noteworthy are focused code enforcement, priority in the tax-delinquent housing sale process, accelerated historic properties review, and counseling and replacement housing assistance.

Code enforcement: At the beginning of the NIB program and each time the impact area boundaries are expanded, the city evaluates code enforcement compliance of the properties in the area. Owners whose property is in violation receive notification letters and offers of city assistance to rectify the problems.

Tax-delinquent sales and vacant property disposition: The city has added staff to its law department and real estate office in order to focus more attention on moving vacant, tax-delinquent properties in the NiB impact areas through the tax-sale process.

Historic properties review process: Renovation of properties that are listed or eligible to be listed on the National Register of Historic Places must be reviewed by the Virginia Department of Historic Resources for compliance with federal regulations. To accelerate the review process in the NiB areas, the State of Virginia delegated its review authority to the City of Richmond so that the review process, which normally takes up to six months, can be completed in as little as two months.

Counseling and replacement housing assistance: Although the main thrust of the NiB program to date has been to rehabilitate or replace vacant houses and build new ones, the program does not exclude occupied properties. Since an important goal of the program is to increase property values in an area, there is a potential danger that some low-income residents may be displaced. To address this issue, the city deploys two housing counselors (one of whom is dedicated solely to the NiB program) to provide assistance to residents. For example, senior citizens, whose property values increase after rehabilitation through NiB efforts, are enrolled in the senior-citizen property tax abatement program. In some cases (reportedly less than five per year), the city finds replacement housing – often in subsidized senior-citizen housing complexes. The counselors also help renters threatened with displacement due to rising rents by finding replacement housing for them.

Clearly, the city and LISC have succeeded in creating a commitment to neighborhood development that is targeted, sustained and comprehensive. But, after five years of efforts, what have the impacts of this approach been? Can one say with convincing evidence that the NiB strategy has significantly improved the quality of life in the NiB target areas and in adjacent communities?

We address this issue through quantitative and qualitative analysis. First, this section details how the two tiers of questions will be quantitatively assessed.

- Tier 1 Questions: *Is There a Measurable Impact?* Do observed patterns of neighborhood changes (measured by single-family home sales values) support the hypothesis that the community development efforts in Richmond, particularly those accomplished under the NiB program, have changed the trajectories of the target neighborhoods from what they would have been in the absence of interventions?

- Tier 2 Questions: *Why?* If the answers to Tier 1 questions are affirmative, what is the nature and scale of the community development investments that are correlated with the largest positive impacts?

The section begins by describing briefly the adjusted interrupted time series (AITS) method for measuring neighborhood impacts. It also describes *desiderata* for data on which neighborhood indicators can be based, thereby justifying the use of the home sales data that have been assembled for the Richmond analysis. Second, it presents the impact analysis design for Tier 1. Third, it presents a series of designs for exploring various aspects of Tier 2 questions. Finally, it presents the results from application of the Tier 1 and Tier 2 AITS designs to measure the impacts of the NiB program interventions in Richmond.

Measuring Impacts of Community Development Initiatives

Do efforts by governments, CDCs, intermediaries (like LISC) or for-profit developers to revitalize distressed, inner-city neighborhoods make any demonstrable difference? Put differently, can a method be devised for persuasively quantifying the degree to which significant, place-based investments causally contributed to that neighborhood's trajectory, compared to what would have occurred in the absence of intervention? This challenge to measure causal impacts of community development initiatives quantitatively has been raised by legislators, foundation program officers and social scientists alike (Vidal, 1992, 1995; Smith, 2003). It is of central relevance for a host of contemporary policy initiatives, such as those undertaken by Richmond.

The approach advocated in this paper as the "gold standard," labeled AITS, has long been known as a quasi-experimental research design (Campbell and Stanley, 1963; Cook and Campbell, 1979; Shadish, Cook and Campbell, 2002).[6] Its strength is in

dealing with the co-mingled problems that have plagued the ability to draw causal inferences from prior methods, *establishing a convincing counterfactual and dealing with neighborhood selection bias.* Essentially, the AITS method makes pre- and post-intervention comparisons of both the level and slope (collectively what is called "trend" hereafter) of the target neighborhood outcome indicator of interest. The post-intervention measurements are adjusted, however, for regional factors (such as the state of the economy) that affect the outcome indicator in all of the city's neighborhoods, including those that were not targeted for the intervention. Thus, the method makes both pre- and post-comparisons within the intervention neighborhood, after taking into account factors that affect the measured outcome in all neighborhoods, and so does a much better job in isolating the effect of the targeted intervention on conditions in the target areas. As such, it can offer a powerful tool to the program impact evaluator and policy analyst in the realm of community development.[7]

While there is great strength in the AITS approach, it does have demanding data requirements. Although there are many criteria that may be employed when developing a sound neighborhood indicators system (Sawicki and Flynn, 1996), three aspects of available information are crucial. Impact analyses can provide convincing evidence of true causal impact from an intervention (as opposed to spurious correlation or selection biases[8]) to the degree that the underlying data meet three *desiderata:*

- They are measured over an extended period, both before and after the intervention being investigated.
- They are measured frequently within this extended period.
- They are measured at a small geographic scale (at the limit, a precise geographic point).

Of course, most impact evaluations cannot acquire data that meet all these desired features, so they must settle for some method short of AITS. The data set used to conduct this evaluation, individual single-family home sales from 1990-2003, meets all three criteria extremely well. Moreover, home sales prices are well known to capitalize many changes in the underlying desirability of neighborhoods, and thus represent a powerful summary measure of neighborhood trajectory (Freeman, 1979; Palmquist, 1992; Galster et al., 2004a).

[6] Shadish, Cook and Campbell (2002:182) refer to AITS as "interrupted time series with nonequivalent, no treatment control group time-series."

[7] A more thorough explanation of the AITS approach and its advantages over other evaluation methods is provided in Appendix C. Also see Galster et al. (2004a).

[8] A common selection bias is that city interventions are targeted at neighborhoods that already offer strong prospects for renewal in the absence of any intervention. If such selection biases are not controlled, the apparent impact of the city intervention will be exaggerated.

The home sales data were purchased from First American Corporation, a commercial supplier of business data. The original data set consisted of the property tax records (including information on the last two sales) of 14,484 real property parcels in Richmond, 12,453 of which were single-family homes. From these records, a file containing individual sales records with property characteristics of single-family homes was created. The properties were geocoded to the exact street address or census block centroid to add latitude and longitude coordinates and census block identifiers, as well as to determine if a home was inside or outside of an NiB target area.[9] Outlier sales, consisting of those in the top and bottom 2 percent of sales prices and lot sizes, were excluded from this file since it could not be determined if they would both be representative of sales in Richmond and involve arms-length transactions. Furthermore, since the representation of sales in this data set is thinner as one goes further back in time, only sales from July 1990 (start of FY 1990/91) onward were used. Hence the database used in this analysis consists of 15,889 sales. The data are summarized in Table 5.

The home sales data are sufficient to answer the Tier 1 questions on the impacts of the community interventions. However, to be able to answer the Tier 2 questions on the nature and scale of the community development investments that are correlated with the largest positive impacts, data were needed on the type and quantity of resources invested in Richmond neighborhoods during the NiB period. Like the home sales, these investment data must also be available with relative frequency and at a small geographic scale. Therefore, it was necessary to restrict the information exclusively to investments that could be attributed to specific street addresses.

Data on investments from July 1998 through the early part of FY 2003/04 were provided both by the City of Richmond and by Richmond LISC.[10] In each case, records of project-specific, hard-cost disbursements by street address were obtained. The project addresses were geocoded to add census block identifiers so that total investments for blocks inside and outside NiB target areas could be tabulated.[11] City disbursements (primarily CDBG and HOME) were identified by fiscal year; LISC investments were identified by a specific date and then converted to fiscal year. Note that the official start date of the NiB program is FY 1999/00. For our statistical analysis, however, we have used FY 1998/99 as the start of the "post-NiB" period to take into account any possible anticipation effect of people learning about the NiB

[9] The data were geocoded using ArcGIS 8 against a street file from the City of Richmond's Central Address File and the ArcGIS street map supplement. Property addresses that could not be geocoded to a sufficient level of precision were excluded from the analysis. This resulted in the removal of 507 parcels (< 5 percent).

[10] The authors wish to express their profound gratitude to David Sacks of the Richmond Department of Community Development and Wendy Hirsch of LISC for their efforts in providing and interpreting the investment data.

[11] Data were geocoded with a combination of ArcGIS 8, the address lookup feature of the Census Bureau's American Factfinder Web site and the ESRI Street Map.

TABLE 5: Home Sales in the City of Richmond, Fiscal Years 1990/91–2003/04

By Fiscal Year	Number of sales			Average sales price ($)			Median sales price ($)		
	Entire City	Outside NiB Target Areas	Inside NiB Target Areas	Entire City	Outside NiB Target Areas	Inside NiB Target Areas	Entire City	Outside NiB Target Areas	Inside NiB Target Areas
Total	15,889	15,266	623	116,896	118,873	68,450	91,700	93,950	60,000
1990/91	277	269	8	88,094	89,493	41,050	69,000	70,000	37,300
1991/92	301	292	9	94,149	95,496	50,467	76,000	77,000	48,500
1992/93	362	353	9	101,382	102,782	46,444	85,000	86,000	57,000
1993/94	423	413	10	94,321	95,605	41,300	84,000	85,000	38,000
1994/95	455	441	14	93,227	95,179	31,743	79,000	80,000	32,449
1995/96	1,004	971	33	88,182	89,765	41,612	73,225	74,998	38,000
1996/97	1,048	1,014	34	97,922	99,889	39,271	81,000	83,500	35,000
1997/98	1,473	1,408	65	101,263	104,129	39,182	84,000	86,400	36,144
1998/99	1,674	1,631	43	97,112	98,500	44,490	79,850	80,000	35,000
1999/00	1,325	1,286	39	121,741	123,515	63,222	99,500	104,250	60,000
2000/01	2,099	2,012	87	120,360	121,962	83,312	95,000	99,000	65,000
2001/02	2,010	1,916	94	138,631	141,872	72,558	118,975	123,603	70,000
2002/03	2,396	2,264	132	139,409	142,222	91,163	110,000	115,000	79,950
2003/04	1,042	996	46	149,814	151,863	105,441	126,000	129,975	89,975

Source: First American Corporation real property data for single-family homes compiled by the Urban Institute.

program and acting on that information prior to the investments being put in place. In addition, the city NiB investment data do include investments prior to FY 1999/00.[12]

The city investment data was extracted from a special "tracker" database used by the Department of Community Development to track the city's project-specific expenditures in the NiB target areas. Investments from the tracker database consist primarily of those funded from CDBG and HOME, but also include additional investments from other federal, state and city sources, such as Section 108 loans. The tracker database only records hard costs; we restricted our analysis to expenditures for the following activities: acquisition, clearance/demolition, new construction and rehabilitation/repair. The resulting city investment data set consists of a total of $13.92 million of hard-cost, address-specific disbursements in NiB target areas. As noted above, this amount is less than the total expended by the city, especially in CDBG and capital improvement funds, because some of these expenditures could not be associated with a specific street address. The data are summarized in Table 6.

The LISC investment data were extracted from their investment tracking system, which records information on all LISC-funded housing (single-family and multi-family), commercial and mixed-use projects throughout the City of Richmond. Activities in the LISC data include commercial development, new construction and rehabilitation/repair. The resulting LISC investment data set consisted of a total of $7.24 million of hard-cost, address-specific disbursements both inside and outside NiB target areas. These data are summarized in Table 7.

From the information provided by the city and LISC, the following investment measures for each block in the city for each NiB year were constructed:

- City of Richmond investments
- LISC investments
- Total of city and LISC investments.

[12] Nevertheless, we evaluated alternative versions of the basic model where we made the start of the post-NiB period 1999/00 instead of 1998/00. The model results were robust to this change in the start of the post-NiB period – no significant changes in investment impacts were observed.

TABLE 6: Selected City Disbursements on Housing/Community Development Projects in Richmond NiB Target Areas, Fiscal Years pre 1999/00–2003/04

By NiB Target Areas	Disbursement Amount ($)						
		By Fiscal Year					
	Total	pre 1999/00	1999/00	2000/01	2001/02	2002/03	2003/04
All Areas	13,923,244	198,799	5,734,954	4,083,168	2,257,069	1,324,138	325,116
Blackwell	3,589,160	45,790	499,540	1,481,175	744,407	714,778	103,470
Carver/ Newtowne West	3,414,961	–	1,919,512	1,365,049	130,400	–	–
Church Hill	1,961,747	153,009	1,095,556	332,359	136,793	147,560	96,470
Highland Park–Southern Tip	1,225,638	–	691,336	343,535	190,767	–	–
Jackson Ward	1,060,347	–	526,830	211,640	252,500	69,377	–
Oregon Hill	235,682	–	2,232	37,000	22,319	111,839	62,292
Southern Barton Heights	2,435,709	–	999,948	312,410	779,883	280,584	62,884

Source: City of Richmond data compiled by the Urban Institute.

TABLE 7: Richmond LISC Address-Specific Hard-Cost Investments Fiscal Years 1998/99–2003/04

By NiB Target Areas	Disbursement Amount ($)						
		By Fiscal Year					
	Total	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Entire City	7,239,627	631,590	1,248,774	1,632,440	2,029,564	1,364,590	332,669
Blackwell	1,040,295	73,705	87,986	93,765	124,325	498,881	161,633
Carver/ Newtowne West	21,300	–	–	–	10,000	5,000	6,300
Church Hill	1,511,106	44,400	161,241	125,550	849,000	317,165	13,750
Highland Park Southern Tip	259,676	–	46,500	5,000	8,176	200,000	–
Jackson Ward	395,000	–	395,000	–	–	–	–
Oregon Hill	1,152,635	–	412,278	543,964	77,641	–	118,75
Southern Barton Heights	329,846	55,596	–	–	154,250	120,000	–
Outside NiB Target Areas	2,529,769	457,889	145,769	864,161	806,172	223,544	32,235

Note: Investments (total $214,149) where the exact geographic location could not be specified are excluded.
Source: Richmond LISC data compiled by the Urban Institute.

Research Question 1A: Are single-family home sales values (adjusted for features of homes sold) in NiB target areas significantly higher after the intervention than they would have been otherwise? [13]

The basic AITS regression specification used may be expressed symbolically as:

$$V_t = c + b\,[STRUCT] + d \cdot DIMP_t + e \cdot DPOSTIMP_t + f \cdot TRIMP_t + g \cdot TRPOSTIMP_t + h\,[TIME] + j\,[SPACE] + e \quad [1]$$

Where the variables are defined as follows:

V	Log of home sales value (indicator of program intervention outcome of interest)
c	Constant term
[STRUCT]	*Vector of structural characteristics of the home being sold:* Building living area, lot acreage, number of stories and rooms, structure age, building materials and amenities. With exception of living area and lot size, which were continuous, all characteristics were expressed as dummy variables, with the most common value being omitted for each characteristic.
DIMP	*Target area level:* Dummy denoting sale occurred in one of the NiB target areas; both pre- and post-intervention observations equal "one"; zero otherwise.
DPOSTIMP	*Target area post-period level:* Dummy denoting sale occurred in one of the NiB target areas and during the post-intervention period (i.e., after the commencement of NiB investments, FY 1998/99 – 2003/04); zero otherwise.
TRIMP	*Target area trend:* Slope variable for prices in target areas both pre- and post-intervention; equals 1 if sales occur in target areas during first year of the study period (i.e., FY 1990/91), equals 2 if sales occur in target areas during second year, etc.; zero otherwise.
TRPOSTIMP	*Target area post-period trend:* Slope variable for prices in target areas post-intervention; equals 1 if sale occurs in target areas during first year of the NiB period (i.e., FY 1998/99), equals 2 if sale occurs in target areas during second year, etc.; zero otherwise.

[13] "Target areas," refer to those areas designated as target areas by the NiB program, as well as the Oregon Hill neighborhood, which has also benefited from NiB investments. The target areas were defined by the city at the start of the NiB program and have remained constant throughout the study period.

[TIME] Vector of time trend variables defined for all observations; includes three seasonal dummies for sales occurring in second, third and fourth quarters and 13 yearly dummies for sales occurring in FY 1991/92, FY 1992/93,..., FY 2003/04 (FY1990/91 is excluded category).

[SPACE] Vector of spatial heterogeneity correction variables (Can, 1997; Can & Megbolugbe, 1997); this includes the normalized latitude (X), longitude (Y), their squared values and their interaction terms.

e A random error term with statistical properties discussed below.

All lower case letters in the equation (b, c, d, etc.) represent coefficients to be estimated. The subscript "t" denotes a time period for which the indicator is measured; for AITS here, it is annual (fiscal year).[14] White's robust standard errors are used here in conducting significance tests.[15] A log-linear model specification was used, that is, a logarithmic transformation was applied to the dependent variable (home sales price) before estimating the model coefficients. This allows the estimated impacts to be expressed as a percentage change from the base sales price.

The AITS model deals with the neighborhood selection bias challenge (because neighborhoods are not randomly selected for "treatment" through the NiB program) by permitting both the level and slope of the home price indicator in the target areas to differ from that of other neighborhoods *prior to any intervention.* Statistical significance of the d coefficient is equivalent to testing for a difference in pre-intervention levels of the home price indicator in the impact and control neighborhoods; statistical significance of the f coefficient is equivalent to testing for a difference in pre-intervention slopes of the home price indicator in the impact and control neighborhoods. Because these potentially idiosyncratic, pre-intervention target-area levels and slopes are modeled explicitly as a basis for estimating a post-intervention counterfactual, the selection bias challenge is overcome most effectively.[16] Put differently, even if the NiB target areas were on a different trajectory than other Richmond neighborhoods prior to intervention, by measuring the *change* in their trajectory before and after intervention, we obtained an unbiased estimate of the intervention's effect.

[14] Although the above observations occur both over time and cross sectionally, estimation with SAS's TSCSREG procedure is infeasible because many observations will have no sales.

[15] Regression coefficients and White's standard errors were estimated using the REG procedure, SAS version 8.2.

[16] Note that this approach is different from Schill, et al. (2002), which uses a fixed effects model that has separate dummy variables for each time period within a census tract in order to control for neighborhood conditions in pre- and post-intervention time periods. The specification, by allowing for a measured change in both the level and trend in an intervention area, provides for more substantive results. Namely, our specification provides program evaluators with evidence that a targeted intervention resulted in either a one-time change in neighborhood conditions, which would be manifest by a statistically significant change to the DPOSTIMP variable, or a change in the rate of change (TRPOSTIMP), or both.

The test for statistical significance of the coefficient e of the DPOSTIMP variable is equivalent to testing that there is a discontinuous, time-invariant change in the home price levels in the impact neighborhood after the intervention. The size of e provides the quantitative estimate of impact. The test for statistical significance of the coefficient g of the TRPOSTIMP variable is equivalent to testing that there is a change in the price-time slopes (appreciation rate) in the target areas. The product of g and the TRPOSTIMP variable provides the (time-dependent) magnitude of impact. Should both the shift and slope post-intervention coefficients prove not to be significantly different from zero, that result would indicate an absence of impact.

Research Question 1B: Are single-family home prices (adjusted for features of homes sold) significantly higher than they would have been if they occurred near (but not in) a block currently designated as a NiB target area?

The model here tests for spatial spillover effects beyond target areas. It looks like [1] but four variables analogous to $DIMP_t$,• $DPOSTIMP_t$, $TRIMP_t$, and $TRPOSTIMP_t$ applying to home sales in areas "near" (but not in) the target areas, are added to the model: $DNEAR_t$, $DPOSTNEAR_t$, $TRNEAR_t$, and $TRPOSTNEAR_t$. In this case, we defined the "near" area as the set of blocks outside of the NiB target areas whose centroids were within 5,000 feet of the centroid of any NiB target area block.[17] We caution, however, that areas near NiB target areas likely have many forces operating upon them besides spillovers from the NiB intervention, thus any observed impacts cannot unambiguously be traced to the intervention.

[17] We also tried alternative near distances of 2,000 and 10,000 feet, but these did not yield consistent or significant results and so are not presented in this report.

Here the analysis shifts to help policymakers and planners better understand what it was about the community development investments that yielded the impacts measured as per Tier 1 on page 22. As before, causation may only be inferred.

Research Question 2A: Are single-family home prices (adjusted for features of homes sold) in NiB target areas significantly higher than they would have been without NiB, as a function of how many dollars were invested in the block where the sale occurred?

Question 2A asks whether the scale of the investment in the NiB block relates to the measured home price impact. The regression is specified like [1] except that two new variables are added: DPOSTIMP and TRPOSTIMP are both multiplied by the cumulative dollars invested in the given block through the study period.[18] The cumulative amount of the investment was specified as two dummy variables: one for blocks with cumulative investment above the median for all blocks with some investment ($20,100), and one for blocks with cumulative investment below the median. Blocks with no investment were coded as zero for both dummies.

Research Question 2B: Are single-family home prices (adjusted for features of homes sold) significantly higher than they would have been if they occurred near (but not in) an NiB impact block as a function of how many dollars were invested in the block where the sales occurred?

Question 2B asks whether the scale of the investment in the NiB block relates to the measured home price impact on nearby blocks. The regression is specified as for question 2A above, except that $DPOSTNEAR_t$ and $TRPOSTNEAR_t$ are added as well as these two variables multiplied by the cumulated dollars invested in the given block. The investment in the "nearby" blocks was defined as dummy variables in the same manner as 2A.

Research Question 2C: Is there any evidence to suggest that the relationship between any home sales value outcome indicator in an NiB impact block and the dollars invested there is nonlinear, suggestive of a threshold relationship?

Question 2C is the key to answering a long-simmering debate in the field of community development about whether there is some minimum quantum of resources that must be invested before outcome indicators begin to show change. This question could be answered with either of two approaches: the quadratic model and the categorical model.[19] To allow for a more flexible form of the functional relationship between investments and home sales values and to reduce the influence of outliers, the categorical approach was pursued. As explained in 2A above, we specified a model using a series of categorical dummy variables jointly indicating

[18] We tested alternative specifications of the investment variables consisting of various spatially weighted sums of all investments in nearby blocks. None of these alternatives yielded a better model fit than simply using the amount of investment in the block where the sale occurred, so that is the specification we have used in the models presented here.

[19] As for the quadratic model, one could add to the model for question 2A above a corresponding series of "cumulative dollars invested in the block as of point t" *squared* variables interacted with the $DPOSTIMP_t$ and $TRPOSTIMP_t$ variables. Should the coefficient(s) of these quadratic

$DPOSTIMP_t$ and $TRPOSTIMP_t$ and whether the amount of cumulative investment was above or below the median level of $20,100. Blocks that had no investment were coded as zeros for all investment variables. A nonlinearity will be indicated if the coefficients of the two $DPOSTIMP_t$ or the two $TRPOSTIMP_t$ interaction variables are significantly different.

Research Question 2D: Is there any evidence to suggest that the impact on the home sales value outcome indicator in an NiB impact block depends on the source of the dollars invested there?

Two types of distinct dollar flows of investments were discerned in target areas during each year from 1999-2002: city-originated and LISC-originated. The regressions are specified above for research questions 2A-2C, except that each dollar POST variable is replaced by a pair of variables, one delineating city dollars and the other LISC dollars. The size (and/or statistical significance) of these two variables' coefficients provides the answer to question 2D.

Investment data for total, city and LISC investments in blocks with cumulative investment levels above and below the total median of $20,100 are summarized in Table 8. Within each of the three investment categories (total, city and LISC), the first column includes all blocks at or below the $20,100 cut-off based on the cumulative investment from that source; the second column includes blocks with cumulative investment above $20,100. Only blocks with non-zero cumulative investments for each investment category are included in this table.

Table 8 indicates that 214 Richmond blocks had some NiB investments from FY 1998/99 to FY 2003/04. Of those blocks, 107 had total (i.e., city and LISC) cumulative investments at or below the $20,100 cut-off, with an average of $7,000 of investment per block. The remaining 107 blocks had cumulative investments above the $20,100 cut-off, with an average of $190,800 per block. Furthermore, the city was more likely to concentrate its investments in certain blocks than was LISC, as explained above. A higher proportion of blocks with city investments (81 out of 112 blocks, or 72 percent) had total investments above the $20,100 cut-off than did blocks with LISC investments (46 out of 144 blocks, or 32 percent). In blocks where its cumulative investments were above $20,100, the city invested an average of $167,600 per block. For LISC, its average investments per block were $143,400 in blocks where it invested over $20,100.

interaction terms prove significantly different from zero, it would support the hypothesis of nonlinearity; a positive coefficient suggests a threshold. The potential weaknesses of the quadratic model are that: (1) it is sensitive to extreme outlier values of the dependent variable; and, (2) it forces the parameters to conform to a regular mathematical (quadratic) equation, thus blurring precisely where a threshold might ensue. In the case of the investment data, an outlier was found: one block that received $1.44 million in cumulative investments during the period. The next highest investment block only received $ 0.89 million, and the median investment of all blocks receiving any amount of investment was only $20,100 per block.

TABLE 8: Cumulative Total, City, and LISC Investments in Richmond Blocks for Blocks with Investments above and below $20,100, Fiscal Years 1998/99–2003/04

	Total		City		LISC	
	$1 - 20,100	$20,101 +	$1 - 20,100	$20,101 +	$1 - 20,100	$20,101 +
Number of blocks	107	107	31	81	98	46
Cumulative investments per Block ($000s)	7.0	190.8	11.2	167.6	6.6	143.4

Source: City of Richmond and Richmond LISC data compiled by the Urban Institute.

Using the data sources described earlier, the Tier 1 and Tier 2 AITS models for the NiB target areas (including Oregon Hill) were estimated. The model results provide the best possible estimate of the causal impacts of city and LISC investments in the NiB target areas and those nearby, as explained above.

The complete set of model results is provided in Appendix B, while graphical representations of the selected model results are included in this section. In the appendix tables, the standard regression statistics for each model are provided as follows: degrees of freedom, R-square, adjusted R-square and F test. The F tests are all significant at the 0.0001 level, indicating that the models explain a statistically significant level of home sales price variation. The goodness of fit measures R-square and adjusted R-square were 0.68 or greater for each model, indicating that the models explain a high proportion of the variation in home prices during the study period.

For each model's independent variables, the standard regression parameter estimate, the White's robust standard error estimate and the significance level of the coefficient is given. The last column gives the percentage change in home prices associated with a one-unit change in the value of the independent variable. It is calculated as a function of the parameter estimate.[20]

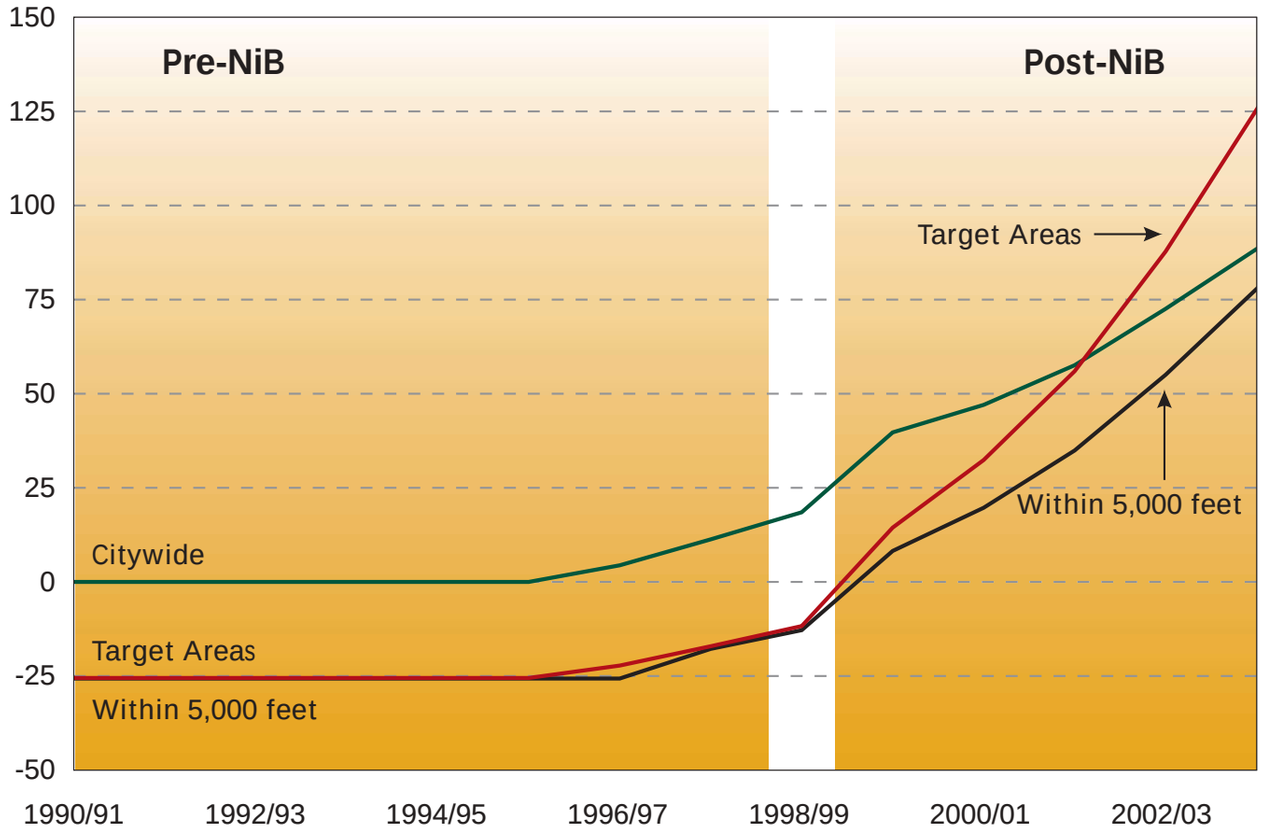
The first model in Appendix B is labeled the "base model." This is the basic home price regression model with none of the target area impact variables included.[21] The estimated value of the model parameters indicates the relative difference between the sales prices of a home with a particular set of characteristics and the price of a "standard home" sold in the first quarter (January to March) of 1991. Based on the mean characteristics in our property data, a standard Richmond home would be one story with eight rooms, one fireplace, a brick exterior, hot water heating, no central air conditioning, and a construction date between 1941 and 1950.

For example, according to the base model, a home sold in FY 1997/98 would cost on average 9.7 percent more than an identical standard home in the first quarter of 1991. A house with only one to five rooms, however, would sell for 11.3 percent less than a standard house with eight rooms. Note that the few coefficients that are not significant are deemed to have no consistent, measurable impact on the price. These results are given in the Appendix and are summarized graphically in Figure 1. The "citywide" line in the figure indicates the annual average prices of standard homes throughout the city as a percentage relative to the base year price in FY 1990/91. As we can see, there is no statistically significant change in average prices until FY 1996/97, when prices increase an average of 4.4 percent. This starts a period of appreciable price growth over the next seven years, where prices reach a high of 88.5 percent over the base year price in FY 2003/04.

[20] The formula for the percentage change is $100 \cdot (e^{b} - 1)$, where b is the parameter estimate.

[21] That is, the base model consists only of the intercept term (c), the property structural characteristics ([STRUCT]), the spatial heterogeneity correction variables ([SPACE]) and the random error term (ε).

FIGURE 1: Percent Difference in Home Prices
Relative to Citywide Baseline in Fiscal Year 1990/01, Models 1A and 1B



To the base model, the price level and trend impact variables are added, as defined in the previous section.[22] The results of this model are summarized by the line marked "target areas" in Figure 1, which indicates the price trend for the NiB target areas, again as a percentage relative to the FY 1990/91 citywide baseline price. The overall level of prices in the target areas starts out in the pre-NiB period at 25.5 percent below that of the citywide average.[23] Since these two lines are parallel for the first nine years of the study period, there is no difference in price appreciation between the city and target areas through the pre-NiB period.[24] With the start of the post-NiB period in FY 1998/99, delineated in the graph by the white bar, the situation changes dramatically. As already noted, prices in the city begin to appreciate rapidly in this period, but they grow even faster in the target areas. The model estimates indicate that the average sales price in the target areas increased 9.9 percent per year *faster* than prices in the city overall.[25] This can be seen graphically in Figure 1 by the much steeper slope of the "target areas" price trend line relative to the "citywide" line. As a result, prices in the target areas reach the citywide average for comparable homes in FY 2001/02 (where the two lines cross) and end up 126 percent higher than the city's FY 1990/91 baseline by the end of the study period in FY 2003/04. In comparison, prices overall in the city were only 88 percent higher than the FY 1990/91 baseline by FY 2003/04. These results indicate a highly positive impact of NiB investments on single-family home prices in the target areas.[26]

The third line shown in Figure 1, labeled "within 5,000 feet" is derived from the results of the model that measures impacts in blocks within 5,000 feet of the target areas.[27] At the start of the pre-NiB period through FY 1995/96, this line is identical to the "impact areas" line, indicating that there are no differences in prices between these two geographic areas for the first six years of the study period. Furthermore, between FY 1995/96 and FY 1998/99 this line continues to closely track the target area curve. In the post-NiB period, however, the lines diverge. While the target area prices increase by 9.9 percent per year relative to the city baseline, the prices in blocks within 5,000 feet of the target area increase by almost half that rate: 5.3 percent. This can be seen in Figure 1 by the shallower slope of the "within 5,000 feet" line relative to the "impact areas" line in the post-NiB period. This suggests that the effects of the NiB investments do have an impact beyond the target area itself, but that those impacts are less than those experienced within the target area. Many other market forces and alternative public investments were operating in

[22] That is, the variables DIMP, DPOST, TRIMP and TRPOST. This is designated as Model 1A in the specification.

[23] The relative difference between the baseline and target area price levels is given by the coefficient of the DIMP impact variable in the model.

[24] The target period trend relative to the overall citywide trend is given by the coefficient of the TRIMP impact variable. Since the estimated coefficient of this term is not significant, however, zero price increase relative to citywide prices is interpreted.

[25] The difference in the post-period target area trend is given by the coefficient of the TRPOST impact variable.

[26] All these findings are extremely statistically significant and robust to alternative specifications.

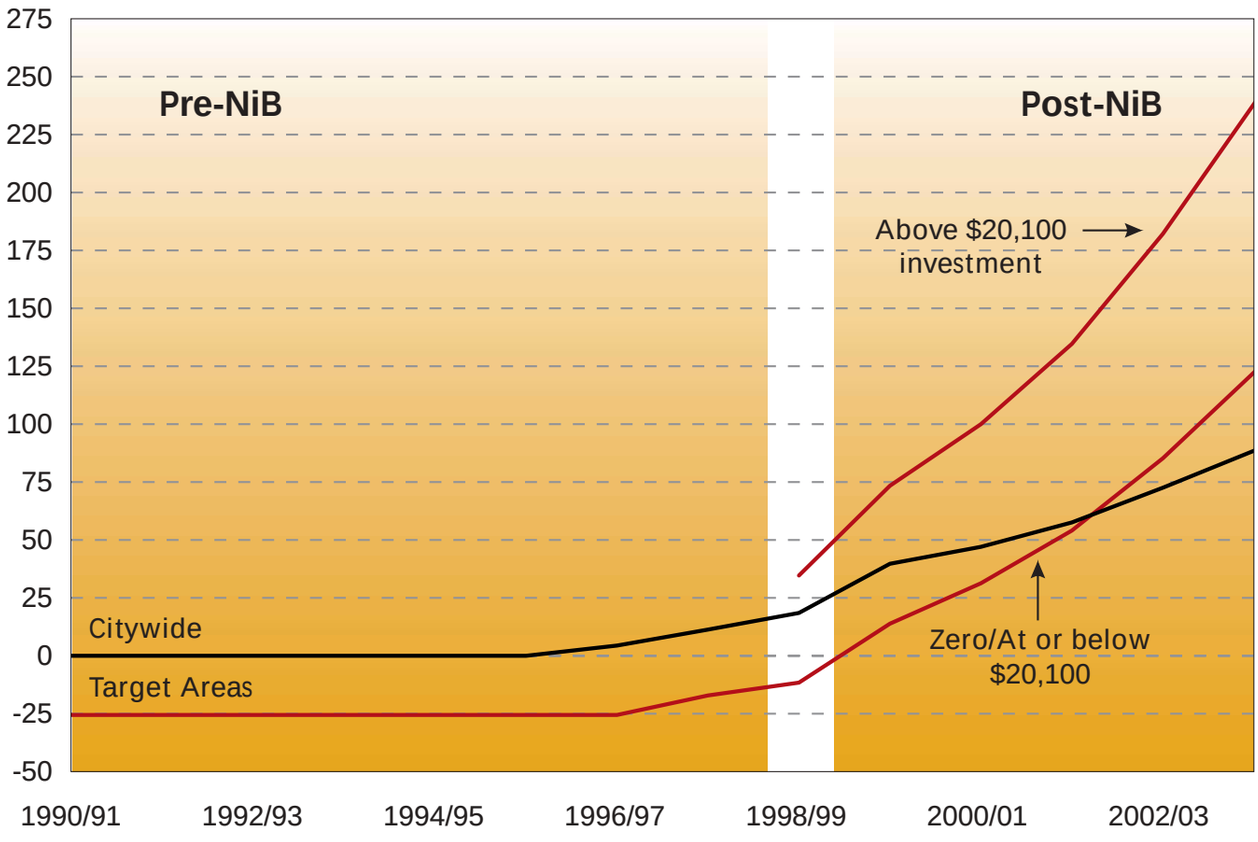
[27] This is Model 1B in the specification.

blocks within 5,000 feet of NiB areas, so what is measured here is not a pure spillover effect from NiB areas.

Figure 2 summarizes the results of the models that measure the differences in impacts based on the amount of the investment in a target area block—specifically, whether the amount of total cumulative investment from both the city and LISC in a block was above or below the median of $20,100.[28] In the pre-NiB period, the "target areas" impact curve is the same as before, parallel to the citywide price trend line. At the start of the post-NiB period, the "target areas" line splits into two lines for impacts in target-area blocks with above-median investment and in target-area blocks with zero or below-median investment. The "zero/at or below $20,100" investment line follows a similar trajectory as the target-area line in Figure 1, increasing 9.1 percent per year in the post-NiB period, indicating that these blocks have only slightly slower price increases than the overall target area average of 9.9 percent per year. The "above $20,100" line, however, receives a price boost upwards of 52.3 percent at the start of the post-NiB period (indicated by the upward "jump" in the line in FY 1998/99) and then continues with a relative price increase of 9.6 percent per year. As a result, by FY 2003/04 the prices in these blocks average 238 percent of the citywide baseline price in FY 1990/91. Therefore, a very significant boost in prices for blocks with investments beyond the $20,100 threshold level is detected. However, home prices in blocks within the NiB target areas with no investments do as well as those with less than $20,100 investment. This surprising result suggests that (1) the designation of a target area (and subsequent significant investment in at least *some* of it) benefits the property investment psychology *across* the entire target area, but (2) the most significant home price impacts occur after a threshold level of investment in the same block has been exceeded.

[28] This is Model 2A in the specification.

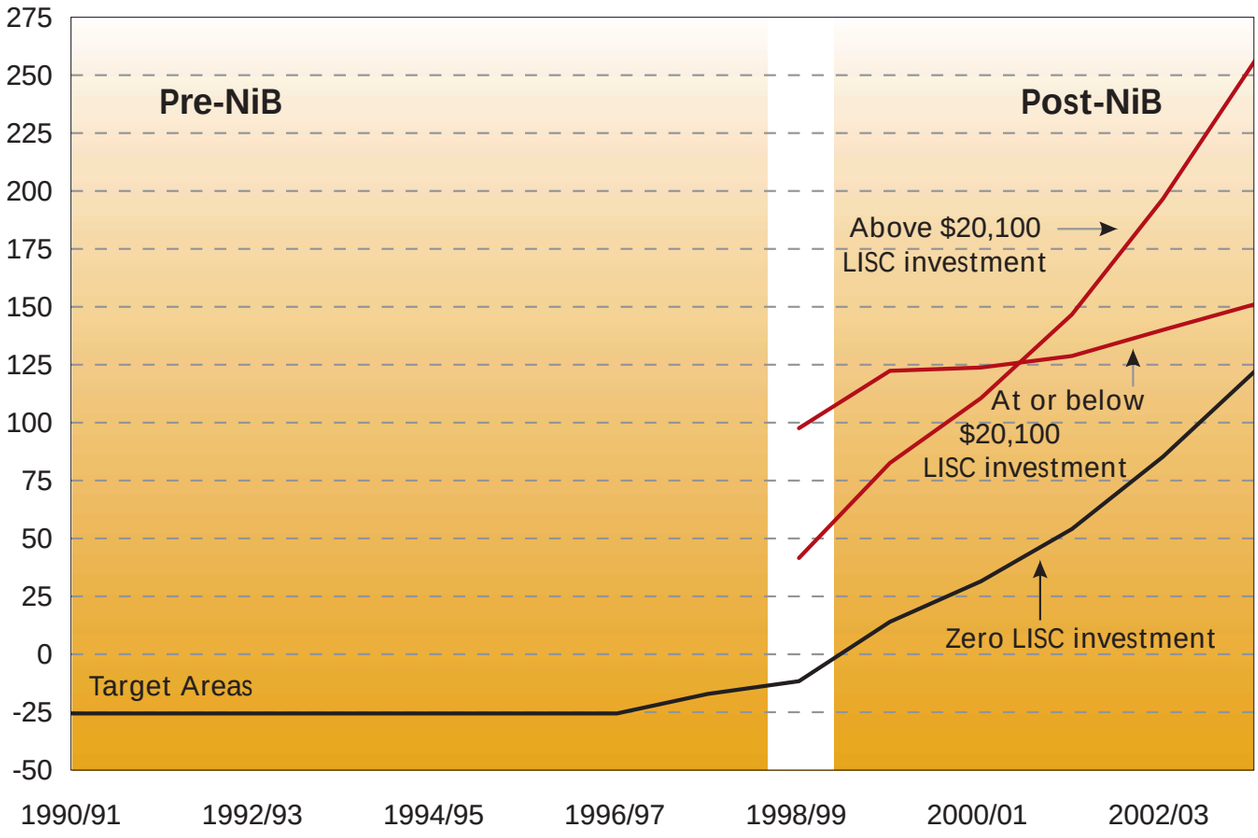
FIGURE 2: Percent Difference in Home Prices
Relative to Citywide Baseline in Fiscal Year 1990/01, Model 2A



Finally, Figure 3 shows the impacts of varied amounts of LISC investments as separate from investments made by the City of Richmond.[29] The model failed to find significant differences in impacts across NiB blocks associated with variations in city investments, so no separate curve is shown for the city investments. But, the city has invested more heavily and more widely in the NiB target areas than has LISC, and so the overall impacts in the target areas are likely directly attributable to the city's investments as a whole. Like Figure 2, there is a notable threshold effect over $20,100 per block where impacts from city and LISC investments improve significantly. What the results in Figure 3 suggest is that there is an additional benefit brought about by having LISC investments in a target area. If there are no LISC investments in a block, then the price trajectory, indicated by the "zero investment" line, is the same as the overall target area trends shown in Figure 1. If cumulative LISC investments are not zero but are "at or below $20,100," however, there is a short-term relative price boost of 123 percent at the start of the post-NiB period, but afterwards prices increase at a slower rate than the blocks without LISC investment. Finally, when cumulative LISC investments are "above $20,100" in a block, there is a short-term price boost of 60 percent, and afterwards prices appreciate 13-percent-per-year faster than they do in blocks with lower levels of LISC investment. Again, this suggests a strong additional threshold effect for LISC investments in the NiB target areas.

[29] This figure is derived from the results of Model 2C.

FIGURE 3: Percent Difference in Home Prices Relative to Citywide Baseline in Fiscal Year 1990/01, Model 2C – LISC Investments



This section describes the impacts of targeted city and LISC investments in the NiB areas (plus Oregon Hill), as experienced by nonprofit housing providers, city officials, neighborhood residents, for-profit developers, lenders, appraisers and academics in Richmond. The analysis largely echoes the positive findings of the quantitative analysis. At the same time, however, it identifies factors other than CDBG, HOME and LISC investments that have stimulated private market activity, especially in areas near the NiB target areas. Some of these factors are more salient in some neighborhoods than in others. In brief, they are as follows: (1) A positive national climate for real estate investment. Low interest rates, growing incomes during the 1990s and declining stock market values after 1999 (when the NiB program started) led many people to invest in real estate. One real estate professional stated that since 2000 the market has been "a seller's market. It's affected every price range, neighborhood and house style. In the moderate price ranges, people are offering as much as $1,000 over any bona fide contract when they bid on a house." (2) The population of the Richmond region continues to grow at a healthy pace; some of that results in increased demand for housing in the inner city. (3) Demand for high-quality housing in historic Richmond neighborhoods has nowhere to go but the NiB areas or areas nearby, because neighborhoods that gentrified earlier have become too expensive. This factor would explain some of the rapid increase in home sales prices in areas within 5,000 feet (about one mile) of the NiB target areas and within some of the NiB target areas themselves. For example, the market for central-city condominiums, although small, is now growing rapidly. These condominiums are located within 5,000 feet of one, if not two, NiB target areas. (4) Between 1997 and July 2004, the city spent most of a $26.9 million HUD Hope VI grant, mostly in Blackwell and two contiguous neighborhoods. (5) Since 1997, Virginia Commonwealth University has spent $100 million expanding into Broad Street and thereby revitalizing this major east-west commercial corridor through the CBD, increasing housing values in the Carver area. (See next page.) Since these factors do not apply to all of the NiB target areas, a neighborhood-by-neighborhood analysis is the most appropriate way to explain their importance, along with the impacts that CDBG, HOME and LISC investments are perceived to have generated.

Blackwell

As Table 1 indicates, Blackwell faces significant challenges. It has a poverty rate almost double the citywide average and its percentage of vacant property is close to three times that average. Until recently, the area's image was defined by the large, crime-ridden public housing project on the eastern end of the NiB target area. For over 10 years, the Southside Community Development and Housing Corporation (SCDHC), with some assistance from LISC, has constructed new housing and rehabilitated existing housing in and near the NiB impact areas, targeting blocks and block clusters, much as the NiB program does. Indeed, the SCDHC was already working in one of the two impact areas when the program began (however, the pro-

gram does not include other nearby areas where the CDC was working). As indicated in Table 2C, 99 houses were constructed, repaired or rehabilitated in the impact areas between July 1999 and February 2004. Residents and observers expressed great satisfaction with the SCDHC's work. However, by all accounts, housing development in the impact areas (on the western side of the target area) has yet to stimulate significant investment by the private for-profit sector. Private-sector real estate professionals maintain that the lack of large, historic homes, the lingering image (and reality) of crime and, to a lesser extent, the lack of a viable commercial district nearby continue to deter large-scale private investment.

However, the eastern side of the Blackwell target area no longer houses a troubled public housing project. In 1996 the city received a $26.9 million Hope VI grant from the U.S. Department of Housing and Urban Development to demolish the 440-unit development and replace it with 289 multi-family units and 209 single-family homes. Since then, 99 units of new multi-family housing have been constructed, with an additional 66 units coming on line soon. By 2005, 188 single-family units will be constructed in Blackwell and nearby neighborhoods.[30] Area homeowners and public officials interviewed for this study give the Hope VI program high marks for having replaced the dilapidated public housing with handsome new structures. They perceive increased assessed property values, a growing mix of ethnic and racial groups and a reduction in crime as benefits of both Hope VI and the work of SCDHC.

Nonetheless, some private-sector, real estate professionals are less certain that Hope VI has changed the private real estate market, as they still perceive Blackwell to be an area of concentrated poverty, partly because of the affordable housing units built under the Hope VI program. They note that the rapid pace of condominium and apartment conversions of manufacturing buildings in Manchester – the neighborhood on the northern border of the Blackwell target area – is driven by that area's river views and its proximity to the downtown, not to the developments in Blackwell.

Carver and Newtowne West

In 2000, the Carver and Newtowne West neighborhoods exhibited a high incidence of poverty, female-headed households and vacant property. Intensive revitalization of Carver began a decade earlier, when the RRHA designated the neighborhood a conservation area. Under the NiB program between July 1999 and February 2004, 62 homes were constructed, repaired or rehabilitated in Carver and Newtowne West. (See Table 2C on page 13.) RRHA also has executed agreements with the Better Housing Coalition and with CMN LLC to build a total of 31 new homes for

[30] Richmond Redevelopment and Housing Authority: *Building Partnerships: Annual Report 2003.*

moderate-income persons by 2005.[31] The results of RRHA's work appear to be highly regarded by residents and observers.

Nevertheless, most observers are quick to acknowledge that the significant rise in home sales prices and assessed property values in Carver is due as much to the expansion of Virginia Commonwealth University to the southern edge of the neighborhood and a concomitant increase in private commercial development nearby as it is to RRHA- or NiB-related investment. Since the late 1990s, Virginia Commonwealth University has invested an estimated $100 million in academic buildings, an athletic center and student housing on Broad Street, one block south of the neighborhood. This investment, along with increasing gentrification of the Fan area southwest of Carver, has stimulated an additional $100 million in investment in retail and privately developed student housing in the Broad Street corridor in the last five years.[32] As a result of Virginia Commonwealth University's expansion, private student and employee housing is being developed in Carver as well. Carver's excellent location on the western edge of the CBD, its housing stock and nearby commercial and university-related amenities make it an increasingly attractive choice for young and middle-income persons. At the same time, the moderate-income housing developed by the RRHA and other nonprofits does not detract from or repel private investors. In short, targeted public and nonprofit investment appears to have contributed to the general improvement of the real estate market in the Carver-Newtowne West area.

Church Hill Central

Church Hill Central has a high percentage of persons living in poverty, many of whom are elderly, and a high percentage of vacant properties (see Table 1 and Appendix A). As in Blackwell and Carver/Newtowne West, development outcomes in Church Hill Central since 2000 are largely attributable to two factors – an influx of investor-owners attracted by the neighborhood's historic properties that are less expensive than those in neighborhoods that gentrified earlier and the public and nonprofit development of mixed-income housing.

The Church Hill Central target area lies three blocks north of Broad Street, the east-west corridor that runs through the heart of the CBD. South of Broad Street is the St. John's Church district, which features a large collection of antebellum, brick houses that were restored decades ago and which house mid- to upper-income persons. Over the past 15 years, renovation and gentrification have slowly crept north of Broad Street to the southern and western edges of the NiB target area. This influx of new investors and owners intensified during the past five years, thanks to the national and local real estate climate cited earlier. By 2004, shell buildings located a block or two north of Broad Street were easily selling for $60,000, with no public or private development subsidies.

[31] Ibid.

[32] Russel T. Uzzle, Special Assistant to the Vice President for Finance and Administration, Virginia Commonwealth University, personal communication, August 23, 2004.

A few blocks to the north of this creeping line of gentrification, however, private market development continues to be slow, according to real estate development professionals. This is the area where CDCs, especially the Better Housing Coalition and Interfaith Housing Corporation, have been operating for over 10 years, restoring existing houses and, especially, constructing new ones. Here, the NiB program appears to have made a significant difference. "It's made the process go much faster," said one nonprofit developer. "It's allowed us to do many more houses here than we otherwise would have," said another. Since July 1999, public and nonprofit entities have produced 79 units of new, rehabilitated or repaired housing in Church Hill Central. (See Table 2C.) Near these clusters of nonprofit housing, small, private for-profit developers also feel confident to build or rehabilitate a few houses. As one observer stated, "I know one block where you have four nonprofit houses and two for-profit houses that piggybacked on them." The result, say CDCs, public officials and residents, is that in and immediately adjacent to these blocks, blight has been removed and crime incidents have decreased. Further away from these blocks, however, especially to the north and east of the target area, little private market investment has occurred. (The area to the north of the target area also contains two troubled public-housing projects.)

Highland Park–Southern Tip

Highland Park is one of Richmond's original "streetcar suburbs." Located about one mile from the heart of the CBD, it boasts a large collection of Queen Anne style Victorian houses. Its poverty, youth and vacant housing percentages are high, however; the Southern Tip area in particular suffers from high crime that, until recently, stemmed in part from a troubled low-income housing complex. For over a decade, the Highland Park Community Development Corporation (HPCDC) has used CDBG and HOME funds to help acquire and rehabilitate historic homes in Highland Park, finishing five to eight properties each year. Under the NiB program between July 1999 and February 2004, HPCDC has rehabilitated, repaired or constructed 46 properties. (See Table 2C on page 13.)

HPCDC staff and neighborhood residents report positive results from concentrating resources in the Southern Tip target area. People are taking more pride in their community and newcomers are slowly arriving. Small, for-profit developers are appearing and rehabilitating one house at a time. Property assessments are up and home prices are escalating, so that HPCDC now must pay more for the properties it purchases for rehabilitation. Real estate speculators are becoming more active, exacerbating the price increases. Private real estate professionals confirm the positive price trends in Highland Park. Nevertheless, some believe that prices would rise in Highland Park even without government stimulus because of the neighborhood's proximity to downtown and its large quantity of historic houses, and because prices in the historic neighborhoods have already escalated. They argue that a reduction in crime and the perception of a reduction of crime in the neighborhood would

stimulate more private-sector investment than would public subsidies for housing development. Still, they give HPCDC excellent marks for the quality of its rehabilitation work and agree that it has made important contributions to the revitalization of the neighborhood.

Jackson Ward

As noted in Table 1, Jackson Ward faces multiple challenges, including higher percentages of vacant property and poverty. It still has several blocks of historically significant houses, although large-scale developments during the last several decades have carved up much of the neighborhood. The most recent additions are the expanded Richmond Convention Center and the Virginia Biotechnology Research Park. Nevertheless, interest in the neighborhood on the part of private, for-profit developers and residents has grown during the past decade and particularly during the past five years. As a result, shell buildings, which reportedly sold for $25,000 in the mid 1990s, now fetch $85,000, and the median home price is now reportedly $185,000.

Although much of this interest is due to the location, housing stock and recent large-scale investments in and around Jackson Ward, nonprofit activity – particularly that of the ElderHomes Corporation – has played a role. Between July 1999 and February 2004, CDCs repaired and rehabilitated 28 properties in Jackson Ward.

Oregon Hill

Oregon Hill is not as economically challenged as the NiB areas. Nevertheless, the small neighborhood's mostly moderate-income population and its aging, historically significant housing have made it an appropriate candidate for nonprofit housing intervention since 1991. Until 1998, the Oregon Hill Home Improvement Council (OHHIC) rehabilitated only a couple of houses per year, using CDBG and HOME dollars to subsidize homeownership for moderate-income persons and a small amount of LISC funding for operations. Between 1998 and 2002, OHHIC, like other CDCs, received more operating funds (and organizational development assistance) from LISC that enabled it to increase its staff. Between 1998 and 2004, OHHIC built or rehabilitated 22 houses. (Although Oregon Hill was not included in the NiB program, it has received city general fund dollars since FY 2000/01 and CDBG and HOME funds since FY 2003/04. In addition to OHHIC, the Better Housing Coalition rehabilitated about seven housing units in the northern part of the neighborhood during the past five years.)

However, neither OHHIC nor various observers of development in the neighborhood perceive the CDC's role as a stimulus to private market activity. Rather, they see it as a way of maintaining affordability and historic character as the neighborhood gentrifies. Indeed, in the past three years, for-profit developers have built (or are now finishing) several dozen new condominiums and townhouses on the southern and western fringes of the neighborhood, marketing the area's close proximity to the river and downtown. On the northern boundary, which borders the growing Virginia Commonwealth University, private, for-profit developers are building student housing. Meanwhile, for-profit developers continue to rehabilitate historic properties within the neighborhood. As a result, prices are escalating. In 2004, for example, a renovated, two-bedroom frame dwelling on a tiny lot sold for $300,000 and a 700-square-foot dwelling reportedly sold for $127,000.

Southern Barton Heights

In 2000, Southern Barton Heights had a vacant property rate more than twice the citywide average and high percentages of persons under 18 and in poverty. Since July 1999, 63 homes have been constructed, repaired or rehabilitated in the neighborhood through the NiB program. (See Table 2C.) As of July 2004, Barton Heights' most active CDC – NHS of Richmond – is developing an additional 34 mixed-income homes. These developments, along with the neighborhood's well-built housing stock and close proximity to downtown, have attracted new, ethnically and racially diverse owner-occupants. They also have attracted small, for-profit developers who rehabilitate a couple of houses at a time, and they have attracted real-estate speculators. As a result, average housing prices have doubled in recent years and property assessments have "gone off the charts," as one public official put it.

Thus, targeting of CDBG, HOME and LISC investments and services appears to have had a positive effect, overall, on the revitalization of the seven neighborhoods under study. Yet it would be inappropriate to attribute the resurgence of these neighborhoods solely or, in a few cases, even primarily, to public and nonprofit investment. Rather, these investments are best seen as factors contributing to and, in general, hastening neighborhood revitalization while preserving some degree of housing affordability for persons of modest means, and helping to maintain the historic character of these neighborhoods.

Public and nonprofit investment targeting in Richmond has been successfully implemented and has had positive impacts on the investment climate. Several factors seem to be responsible for this success to date.

1. Committed leaders and competent staff. From its inception, the NiB program enjoyed strong leadership from the city manager and several city councilors. Within the community at large, LISC and several CDCs actively supported and helped organize the initiative. The city staff charged with organizing and implementing the NiB program have reportedly been very competent and helpful.

2. Careful organization of community-wide consensus and effective partnerships. The city administration and community development department, as well as LISC and its affiliated CDCs, actively solicited the input of all affected parties to develop consensus about the need for targeting and about the neighborhoods that should be included. They used a data-driven method of prioritizing the neighborhoods that all could understand. As a result, city councilors were able to support the initiative with little difficulty.

3. Critical mass of multiple resources. The funds and services provided by the city – CDBG, HOME, capital improvement funds, focused code enforcement, tax-delinquent sales and property disposition priority, accelerated historic preservation review, and housing counseling – as well as funds and services provided by LISC, created a critical mass that stimulated private market activity and brought about perceptible change in the target neighborhoods.

4. Supportive private capital. Through both loan capital and homeowner counseling, Richmond's lenders delivered on their commitment to work in low- to moderate-income neighborhoods where the public and nonprofit sectors are laying a foundation for successful revitalization.

The findings presented here contribute to an emerging body of work that attempts to quantify, using the AITS method, the impacts of various sorts of major investments in lower-income urban neighborhoods. Ellen et al. (2001) investigated the neighborhood price impacts of two sorts of new construction efforts to supply affordable housing in New York City during the 1980s and 1990s: the Nehemiah program for large-scale development of single-family homeownership units and the Housing Partnership program for small-scale, two- or three-family units with the owner occupying one.[33] Both these programs operated in distressed New York neighborhoods. They identified a positive home price impact from both programs, with the size of the impact attenuating over distance from the developments: 11 percent within 500 feet, 6 percent at 1,000 feet, and 3 percent at 2,000 feet. Schill et al. (2002) examined the impact of New York City's Ten-Year Plan, which built or rehabilitated over 180,000 housing units in many of the City's distressed neighborhoods since the mid-1980s. They found positive price effects, which were directly related to the concentrations of projects: within 500 feet, prices were boosted 1.8 percentage points by development(s) comprising 50 units or fewer, but 7.4 percentage points by development(s) comprising over 100 units. Though these concentration effects were manifested for both rental and ownership developments, the positive impacts were a few percentage-points smaller for rental developments totaling fewer than 100 units. Schwartz et al. (2002) continued the investigation of New York's Ten-Year Plan, focusing on new construction projects. They also identified positive price impacts that decayed over a distance of up to 2,000 feet. Compared to what they were predicted to have been, sales within 500 feet of a new development were 15 percent higher immediately after construction and gained 2 percentage points further after five years. Finally, Galster et al. (2004) measured the impacts of several CDC-initiated neighborhood comprehensive revitalization programs in Portland, Denver and Boston. In the former two cases, they found significant positive impacts. It is important, however, that none of the impacts measured in these studies are of the magnitude observed here in Richmond. This is, at least in part, a product of the unusual degree to which the NiB program was targeted geographically for concentrated, sustained interventions.

Closely connected to the issue of targeting is the notion of an investment threshold: the point where the public investment becomes significant enough to induce a substantial number of private investors (like current property owners) to reinvest in their properties or build new ones in the neighborhood. There has been longstanding theory to support the notion of an investment threshold (e.g., Taub, Taylor and Dunham, 1984), but the empirical evidence has been scanty and inconclusive about where this threshold might occur. Galster et al. (2004b) examine the relationship between CDBG expenditures and subsequent changes in a variety of neighborhood indicators across 17 cities. The findings indicate that such expenditures do not have a noticeable relationship with altered neighborhood trajectories unless they exceed an

[33] The sales price sample not only included single-family homes and condominiums but also two-family homes and some smaller apartments.

annual average of $87,000 per census tract over a three-year period. Given that the typical city tract contains 40-50 blocks, this implies a threshold of between $5,200 and $6,500 three-year cumulative average investment per block in the target area. This amount is considerably lower than the $20,100 median of all cumulative NiB investments over the six years (though the bulk occurred during only three years) of the NiB program in Richmond. However, recall that NiB figures include other sources besides CDBG funds (and they do not include all of the CDBG funds that the city expended), so the estimates are not perfectly comparable. In any event, additional research is needed to identify more definitively the investment threshold, given the practical policy significance of this parameter.

Finally, the study has focused on what happens when a city chooses to target its neighborhood revitalization resources in a geographically focused and sustained way. In this case, the City of Richmond used a data-driven process that allowed it to target neighborhoods based upon a number of key characteristics (assessment of neighborhood condition and assessment of neighborhood potential) that proved compelling for decision makers. Implicit in this choice of neighborhood characteristics is a model of neighborhood health. As Richmond and other cities continue to target revitalization expenditures to specific neighborhoods, they need to make this model of the healthy neighborhood more explicit in order to justify their entry into a particular neighborhood and to justify moving on to other areas when the neighborhood has been restored.

Similarly, targeting public and nonprofit resources in a neighborhood to prevent it from deteriorating further and to restore it to complete health implies a model of neighborhood change. If the practice of neighborhood revitalization is to advance, this model too must be made explicit. These are clearly the next major frontiers in neighborhood research: developing an explicit model of neighborhood health and a predictive model of neighborhood change, and more precisely identifying the reinvestment threshold.

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Socio-Economic Characteristics of Neighborhoods in Bloom Areas

Blackwell – Neighborhoods in Bloom Area

			percent of total	
Trend	**Blackwell**	**Richmond City**	**Blackwell**	**Richmond City**
Total Population	1,376	197,790		
White	41	76,204	3.0	38.5
Black	1,316	112,655	95.6	57.0
Hispanic	20	5,239	1.5	2.6
Age				
Under 18	452	43,178	32.8	21.8
18–64	750	128,483	54.5	65.0
65 and older	174	26,129	12.6	13.2
Living Situation: Children under 18	452	43,178		
Married Couple	68	14,405	15.0	33.4
Male Head of Household	22	2,122	4.9	4.9
Female Head of Household	223	18,096	49.3	41.9
Group Quarters	0	317	0.0	0.7
Housing Units	651	92,282		
Occupied	500	84,549	76.8	91.6
Vacant	151	7,733	23.2	8.4
Owner Occupied	163	39,010	32.6	46.1
Renter Occupied	337	45,539	67.4	53.9
Poverty (census tracts)				
Below Poverty Level	1,476	40,185	35.8	20.3

Sources: Population, age and housing data from Census 2000 SF1 tables; block data provided by Brooke Hardin, City of Richmond; poverty data from Census 2000 SF 3; and census tract level from City of Richmond Web site.

Note: Poverty data for Blackwell NiB based on census tract population of 4,124.

Church Hill – Neighborhoods in Bloom Area

Trend	Church Hill	Richmond City	percent of total: Church Hill	percent of total: Richmond City
Total Population	1,505	197,790		
White	78	76,204	5.2	38.5
Black	1,402	112,655	93.2	57.0
Hispanic	25	5,239	1.7	2.6
Age				
Under 18	328	43,178	21.8	21.8
18–64	879	128,483	58.4	65.0
65 and older	298	26,129	19.8	13.2
Living Situation: Children under 18	328	43,178		
Married Couple	65	14,405	19.8	33.4
Male Head of Household	9	2,122	2.7	4.9
Female Head of Household	151	18,096	46.0	41.9
Group Quarters	0	317	0.0	0.7
Housing Units	822	92,282		
Occupied	644	84,549	78.3	91.6
Vacant	178	7,733	21.7	8.4
Owner Occupied	231	39,010	35.9	46.1
Renter Occupied	413	45,539	64.1	53.9
Poverty (census tracts)				
Below Poverty Level	1,313	40,185	28.2	20.3

Sources: Population, age and housing data from Census 2000 SF1 tables; block data provided by Brooke Hardin, City of Richmond; poverty data from Census 2000 SF 3; and census tract level from City of Richmond Web site.

Note: Poverty data for Church Hill NiB based on census tract population of 4,649.

Jackson Ward – Neighborhoods in Bloom Area

Trend	Jackson Ward	Richmond City	percent of total: Jackson Ward	percent of total: Richmond City
Total Population	1,077	197,790		
White	262	76,204	24.3	38.5
Black	776	112,655	72.1	57.0
Hispanic	39	5,239	3.6	2.6
Age				
Under 18	179	43,178	16.6	21.8
18–64	798	128,483	74.1	65.0
65 and older	100	26,129	9.3	13.2
Living Situation:				
Children under 18	179	43,178		
Married Couple	58	14,405	32.4	33.4
Male Head of Household	9	2,122	5.0	4.9
Female Head of Household	87	18,096	48.6	41.9
Group Quarters	0	317	0.0	0.7
Housing Units	775	92,282		
Occupied	514	84,549	66.3	91.6
Vacant	261	7,733	33.7	8.4
Owner Occupied	157	39,010	30.5	46.1
Renter Occupied	357	45,539	69.5	53.9
Poverty (census tracts)				
Below Poverty Level	345	40,185	31.4	20.3

Sources: Population, age and housing data from Census 2000 SF1 tables; block data provided by Brooke Hardin, City of Richmond; poverty data from Census 2000 SF 3; and census tract level from City of Richmond Web site.

Note: Poverty data for Jackson Ward NiB based on census tract population of 1,098.

Barton Heights – Neighborhoods in Bloom Area

Trend	Barton Heights	Richmond City	percent of total: Barton Heights	percent of total: Richmond City
Total Population	1,346	197,790		
White	52	76,204	3.9	38.5
Black	1,270	112,655	94.4	57.0
Hispanic	22	5,239	1.6	2.6
Age				
Under 18	405	43,178	30.1	21.8
18–64	780	128,483	57.9	65.0
65 and older	161	26,129	2.0	13.2
Living Situation: Children under 18	400	43,178		
Married Couple	83	14,405	20.8	33.4
Male Head of Household	37	2,122	9.3	4.9
Female Head of Household	193	18,096	48.3	41.9
Group Quarters	5	317	1.3	0.7
Housing Units	580	92,282		
Occupied	472	84,549	81.4	91.6
Vacant	108	7,733	18.6	8.4
Owner Occupied	176	39,010	37.3	46.1
Renter Occupied	296	45,539	62.7	53.9
Poverty (census tracts)				
Below Poverty Level	1,454	40,185	23.6	20.3

Sources: Population, age and housing data from Census 2000 SF1 tables; block data provided by Brooke Hardin, City of Richmond; poverty data from Census 2000 SF 3; and census tract level from City of Richmond Web site.

Note: Poverty data for Barton Heights NiB based on census tract population of 6,165.

Carver Newtowne West – Neighborhoods in Bloom Area

Trend			*percent of total*	
	Carver Newtowne West	Richmond City	Carver Newtowne West	Richmond City
Total Population	898	197,790		
White	100	76,204	11.1	38.5
Black	774	112,655	86.2	57.0
Hispanic	24	5,239	2.7	2.6
Age				
Under 18	183	43,178	20.4	21.8
18–64	611	128,483	68.0	65.0
65 and older	104	26,129	11.6	13.2
Living Situation: Children under 18	183	43,178		
Married Couple	26	14,405	14.2	33.4
Male Head of Household	8	2,122	4.4	4.9
Female Head of Household	94	18,096	51.4	41.9
Group Quarters	0	317	0.0	0.7
Housing Units	557	92,282		
Occupied	396	84,549	71.1	91.6
Vacant	161	7,733	28.9	8.4
Owner Occupied	169	39,010	42.7	46.1
Renter Occupied	227	45,539	57.3	53.9
Poverty (census tracts)				
Below Poverty Level	411	40,185	27.9	20.3

Sources: Population, age and housing data from Census 2000 SF1 tables; block data provided by Brooke Hardin, City of Richmond; poverty data from Census 2000 SF 3; and census tract level from City of Richmond Web site.

Note: Poverty data for Carver Newtowne West NiB based on census tract population of 1,472.

Highland Park Southern Tip – Neighborhoods in Bloom Area

Trend	Highland Park	Richmond City	percent of total: Highland Park	percent of total: Richmond City
Total Population	1,417	197,790		
White	24	76,204	1.7	38.5
Black	1,383	112,655	97.6	57.0
Hispanic	10	5,239	0.7	2.6
Age				
Under 18	402	43,178	28.4	21.8
18–64	808	128,483	57.0	65.0
65 and older	207	26,129	14.6	13.2
Living Situation: Children under 18	402	43,178		
Married Couple	107	14,405	26.6	33.4
Male Head of Household	15	2,122	3.7	4.9
Female Head of Household	155	18,096	38.6	41.9
Group Quarters		317	0.0	0.7
Housing Units	647	92,282		
Occupied	530	84,549	81.9	91.6
Vacant	117	7,733	18.1	8.4
Owner Occupied	231	39,010	43.6	46.1
Renter Occupied	299	45,539	56.4	53.9
Poverty (census tracts)				
Below Poverty Level	916	40,185	28.8	20.3

Sources: Population, age and housing data from Census 2000 SF1 tables; block data provided by Brooke Hardin, City of Richmond; poverty data from Census 2000 SF 3; and census tract level from City of Richmond Web site.

Note: Poverty data for Highland Park NiB based on census tract population of 3,179.

Oregon Hill – Neighborhoods in Bloom Area

Trend	Oregon Hill	Richmond City	*percent of total* Oregon Hill	Richmond City
Total Population	814	197,790		
White	749	76,204	92.0	38.5
Black	18	112,655	2.2	57.0
Hispanic	47	5,239	5.8	2.6
Age				
Under 18	115	3,178	14.1	21.8
18–64	660	128,483	81.1	65.0
65 and older	39	26,129	4.8	13.2
Living Situation: Children under 18	115	43,178		
Married Couple	58	14,405	50.4	33.4
Male Head of Household	9	2,122	7.8	4.9
Female Head of Household	29	18,096	25.2	41.9
Group Quarters	0	317	0.0	0.7
Housing Units	431	92,282		
Occupied	392	84,549	91.0	91.6
Vacant	39	7,733	9.0	8.4
Owner Occupied	166	39,010	42.3	46.1
Renter Occupied	226	45,539	57.7	53.9
Poverty (census tracts)				
Below Poverty Level	133	40,185	16.4	20.3

Sources: Population, age and housing data from Census 2000 SF1 tables; block data provided by Brooke Hardin, City of Richmond; poverty data from Census 2000 SF 3; and census tract level from City of Richmond Web site.

Note: Poverty data for Oregon Hill NiB based on census tract population of 812.

Estimation of Investment Impacts—Complete Model Results

Base Model: Basic Hedonic Sales Price Model

R-square: 0.6901 **Adjusted R-square:** 0.6891
F value (probability): 678.31(<.0001) **Degrees of Freedom (corrected):** 15,888

Dependent variable: Log of sales price

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
Intercept	10.89278	0.03168	***	–
Sale date April–June	0.05012	0.00855	***	5.14
Sale date July–September	-0.00562	0.00952		-0.56
Sale date October–December	-0.01052	0.00962		-1.05
Sale date 1991/92	0.02734	0.02985		2.77
Sale date 1992/93	-0.02974	0.03358		-2.93
Sale date 1993/94	-0.01918	0.03034		-1.90
Sale date 1994/95	-0.04034	0.03115		-3.95
Sale date 1995/96	0.01882	0.02594		1.90
Sale date 1996/97	0.03450	0.02638		3.51
Sale date 1997/98	0.09240	0.02548	***	9.68
Sale date 1998/99	0.16874	0.02517	***	18.38
Sale date 1999/00	0.33298	0.02462	***	39.51
Sale date 2000/01	0.38365	0.02432	***	46.76
Sale date 2001/02	0.45713	0.02436	***	57.95
Sale date 2002/03	0.55042	0.02409	***	73.40
Sale date 2003/04	0.64203	0.02563	***	90.03
Bldg/Living Area (100s square feet)	0.02110	0.00144	***	2.13
Lot Acreage	0.16684	0.03062	***	18.16
2 stories	0.06159	0.00986	***	6.35
3+ stories	-0.09143	0.01700	***	-8.74
1–5 rooms	-0.12096	0.01668	***	-11.39
6 rooms	-0.06177	0.01185	***	-5.99
7 rooms	0.01191	0.00899		1.20
9 rooms	0.01965	0.01003	+	1.98
10+ rooms	0.00672	0.01288		0.67

Continued on next page...

Base Model: Basic Hedonic Sales Price Model

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
2 baths	0.08353	0.00870	***	8.71
3+ baths	0.27602	0.01435	***	31.79
No fireplaces	-0.15860	0.00877	***	-14.67
2+ fireplaces	0.12932	0.01195	***	13.81
Wood exterior	-0.15277	0.00962	***	-14.17
Aluminum exterior	-0.16376	0.01190	***	-15.11
Asbestos exterior	-0.18108	0.01443	***	-16.56
Stucco exterior	-0.18097	0.01723	***	-16.55
Other exterior (except brick)	-0.21124	0.01880	***	-19.04
Dry wall interior	-0.04593	0.01805	*	-4.49
Central A/C	0.13244	0.00724	***	14.16
Forced air heating	-0.11394	0.00896	***	-10.77
Wall heating	-0.13026	0.01441	***	-12.21
Radiant heating	-0.09897	0.01617	***	-9.42
Other heating (except hot water)	-0.23477	0.01658	***	-20.92
Built 1910 or earlier	0.04366	0.02056	*	4.46
Built 1911–1920	-0.05775	0.01841	**	-5.61
Built 1921–1930	0.00801	0.01326		0.80
Built 1931–1940	0.08499	0.01151	***	8.87
Built 1951–1960	-0.03082	0.00939	**	-3.04
Built 1961–1970	0.02935	0.02159		2.98
Built 1971 or later	0.17486	0.02370	***	19.11
X	-0.15559	0.00463	***	-14.41
Y	0.15725	0.00390	***	17.03
X • X	-0.08700	0.00272	***	-8.33
X • Y	-0.12012	0.00473	***	-11.32
Y • Y	0.00411	0.00329		0.41

*Significance (two-tailed): *** = 0.001, ** = 0.01, * = 0.05, + = 0.10*

Model 1A: Located in Target Area, Post Level & Trend

R-square: 0.6971
F value (probability): 650.61 (<.0001)
Adjusted R-square: 0.6960
Degree of Freedom (corrected): 15,888

Dependent variable: Log of sales price

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
Intercept	10.88111	0.03142	***	–
Target area level	-0.29450	0.13497	*	-25.51
Target area trend	-0.03142	0.02142		-3.09
Target area post period level	0.10144	0.10841		10.68
Target area post period trend	0.09478	0.02979	**	9.94
Sale date April–June	0.05097	0.00845	***	5.23
Sale date July–September	-0.00569	0.00942		-0.57
Sale date October–December	-0.00997	0.00950		-0.99
Sale date 1991/92	0.03003	0.02950		3.05
Sale date 1992/93	-0.02727	0.03339		-2.69
Sale date 1993/94	-0.01621	0.03001		-1.61
Sale date 1994/95	-0.03416	0.03078		-3.36
Sale date 1995/96	0.02599	0.02570		2.63
Sale date 1996/97	0.04318	0.02617	+	4.41
Sale date 1997/98	0.10713	0.02504	***	11.31
Sale date 1998/99	0.16974	0.02488	***	18.50
Sale date 1999/00	0.33450	0.02440	***	39.72
Sale date 2000/01	0.38552	0.02406	***	47.04
Sale date 2001/02	0.45472	0.02412	***	57.57
Sale date 2002/03	0.54558	0.02386	***	72.56
Sale date 2003/04	0.63369	0.02532	***	88.46
Bldg/Living Area (100s square feet)	0.02106	0.00143	***	2.13
Lot Acreage	0.16873	0.03045	***	18.38
2 stories	0.07630	0.00983	***	7.9
3+ stories	-0.08720	0.01677	***	-8.35
1–5 rooms	-0.11593	0.01645	***	-10.95
6 rooms	-0.05451	0.01174	***	-5.31
7 rooms	0.01387	0.00885		1.40

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Model 1A: Located in Target Area, Post Level & Trend

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
9 rooms	0.01715	0.00991	+	1.73
10+ rooms	0.00686	0.01275		0.69
2 baths	0.08536	0.00858	***	8.91
3+ baths	0.26878	0.01420	***	30.84
No fireplaces	-0.15132	0.00868	***	-14.04
2+ fireplaces	0.12381	0.01164	***	13.18
Wood exterior	-0.14843	0.00951	***	-13.79
Aluminum exterior	-0.15653	0.01170	***	-14.49
Asbestos exterior	-0.17647	0.01444	***	-16.18
Stucco exterior	-0.17835	0.01708	***	-16.34
Other exterior (except brick)	-0.18971	0.01859	***	-17.28
Dry wall interior	-0.04704	0.01785	**	-4.59
Central A/C	0.13263	0.00714	***	14.18
Forced air heating	-0.10465	0.00888	***	-9.94
Wall heating	-0.12381	0.01424	***	-11.65
Radiant heating	-0.09603	0.01592	***	-9.16
Other heating (except hot water)	-0.21427	0.01632	***	-19.29
Built 1910 or earlier	0.09284	0.02074	***	9.73
Built 1911–1920	-0.04949	0.01833	**	-4.83
Built 1921–1930	0.01059	0.01317		1.06
Built 1931–1940	0.08748	0.01145	***	9.14
Built 1951–1960	-0.02423	0.00929	**	-2.39
Built 1961–1970	0.03807	0.02140	+	3.88
Built 1971 or later	0.17947	0.02343	***	19.66
X	-0.15159	0.00459	***	-14.07
Y	0.16022	0.00385	***	17.38
X • X	-0.08655	0.00271	***	-8.29
X • Y	-0.11710	0.00470	***	-11.05
Y • Y	-0.00058	0.00328		-0.06

*Significance (two-tailed): *** = 0.001, ** = 0.01, * = 0.05, + = 0.10*

Model 1B: Near Target Area (within 5,000 feet)

R-square: 0.7004
F value (probability): 616.75(<.0001)
Adjusted R-square: 0.6993
Degree of Freedom (corrected): 15,888

Dependent variable: Log of sales price

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
Intercept	10.88822	0.03160	***	–
Target area level	-0.34242	0.13415	*	-29.00
Target area trend	-0.03055	0.02133		-3.01
Target area post period level	0.10146	0.10822		10.68
Target area post period trend	0.09530	0.02969	**	10.00
5000 feet from target area level	-0.29661	0.10605	**	-25.67
5000 feet from target area trend	-0.00605	0.01769		-0.60
5000 feet from target area post period level	0.03407	0.10037		3.47
5000 feet from target area post period trend	0.05147	0.02651	+	5.28
Sale date April–June	0.05202	0.00841	***	5.34
Sale date July–September	-0.00437	0.00937		-0.44
Sale date October–December	-0.00698	0.00944		-0.70
Sale date 1991/92	0.02867	0.02946		2.91
Sale date 1992/93	-0.03038	0.03322		-2.99
Sale date 1993/94	-0.02322	0.03006		-2.30
Sale date 1994/95	-0.04400	0.03077		-4.30
Sale date 1995/96	0.02117	0.02583		2.14
Sale date 1996/97	0.03547	0.02632		3.61
Sale date 1997/98	0.10073	0.02523	***	10.60
Sale date 1998/99	0.15944	0.02502	***	17.28
Sale date 1999/00	0.32424	0.02461	***	38.30
Sale date 2000/01	0.37352	0.02427	***	45.28
Sale date 2001/02	0.44172	0.02436	***	55.54
Sale date 2002/03	0.52922	0.02405	***	69.76
Sale date 2003/04	0.61489	0.02553	***	84.95
Bldg/Living Area (100s square feet)	0.02122	0.00144	***	2.14
Lot Acreage	0.16300	0.03039	***	17.70
2 stories	0.08166	0.00981	***	8.51
3+ stories	-0.08702	0.01664	***	-8.33

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Model 1B: Near Target Area (within 5,000 feet)

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
1–5 rooms	-0.11054	0.01645	***	-10.47
6 rooms	-0.05147	0.01166	***	-5.02
7 rooms	0.01414	0.00880		1.42
9 rooms	0.02011	0.00984	*	2.03
10+ rooms	0.00826	0.01269		0.83
2 baths	0.08765	0.00852	***	9.16
3+ baths	0.26738	0.01420	***	30.65
No fireplaces	-0.14947	0.00864	***	-13.88
2+ fireplaces	0.11818	0.01155	***	12.55
Wood exterior	-0.14383	0.00942	***	-13.40
Aluminum exterior	-0.14650	0.01170	***	-13.63
Asbestos exterior	-0.17264	0.01439	***	-15.86
Stucco exterior	-0.17441	0.01713	***	-16.00
Other exterior (except brick)	-0.18557	0.01864	***	-16.94
Dry wall interior	-0.04747	0.01771	**	-4.64
Central A/C	0.13349	0.00712	***	14.28
Forced air heating	-0.09835	0.00887	***	-9.37
Wall heating	-0.11922	0.01429	***	-11.24
Radiant heating	-0.09457	0.01574	***	-9.02
Other heating (except hot water)	-0.20357	0.01616	***	-18.42
Built 1910 or earlier	0.11108	0.02041	***	11.75
Built 1911–1920	-0.05205	0.01831	**	-5.07
Built 1921–1930	0.00617	0.01317		0.62
Built 1931–1940	0.09110	0.01147	***	9.54
Built 1951–1960	-0.01978	0.00931	*	-1.96
Built 1961–1970	0.04258	0.02122	*	4.35
Built 1971 or later	0.18150	0.02331	***	19.90
X	-0.14184	0.00465	***	-13.22
Y	0.15980	0.00384	***	17.33
X • X	-0.08377	0.00271	***	-8.04
X • Y	-0.11572	0.00469	***	-10.93
Y • Y	-0.00590	0.00330	+	-0.59

*Significance (two-tailed): *** = 0.001, ** = 0.01, * = 0.05, + = 0.10*

Model 2A: Located in Target Area, Interacted with Investments

R-square: 0.6979 **Adjusted R-square:** 0.6967
F value (probability): 609.28 (<.0001) **Degree of Freedom (corrected):** 15,888

Dependent variable: Log of sales price

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
Intercept	10.88158	0.03142	***	–
Target area level	-0.29489	0.13479	*	-25.54
Target area trend	-0.03138	0.02140		-3.09
Target area post period level	-0.01647	0.12181		-1.63
Target area post level • Total cumulative block investment $1 - $20,100	-0.00084	0.36334		-0.08
Target area post level • Total cumulative block investment > $20,100	0.42067	0.18599	*	52.30
Target area post period trend	0.09135	0.03346	**	9.57
Target area post trend • Total cumulative block investment $1 - $20,100	0.04075	0.08217		4.16
Target area post trend • Total cumulative block investment > $20,100	-0.04668	0.04405		-4.56
Sale date April–June	0.05004	0.00843	***	5.13
Sale date July–September	-0.00633	0.00941		-0.63
Sale date October–December	-0.01111	0.00950		-1.11
Sale date 1991/92	0.03000	0.02950		3.05
Sale date 1992/93	-0.02729	0.03339		-2.69
Sale date 1993/94	-0.01632	0.03001		-1.62
Sale date 1994/95	-0.03424	0.03078		-3.37
Sale date 1995/96	0.02579	0.02571		2.61
Sale date 1996/97	0.04304	0.02617		4.40
Sale date 1997/98	0.10708	0.02504	***	11.30
Sale date 1998/99	0.17173	0.02487	***	18.74
Sale date 1999/00	0.33329	0.02440	***	39.55
Sale date 2000/01	0.38457	0.02405	***	46.90
Sale date 2001/02	0.45308	0.02413	***	57.31
Sale date 2002/03	0.54611	0.02386	***	72.65
Sale date 2003/04	0.63553	0.02530	***	88.80

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Model 2A: Located in Target Area, Interacted with Investments

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
Bldg/Living Area (100s square feet)	0.02113	0.00144	**	2.14
Lot Acreage	0.16974	0.03046	***	18.50
2 stories	0.07607	0.00981	***	7.90
3+ stories	-0.08718	0.01678	***	-8.35
1–5 rooms	-0.11471	0.01637	***	-10.84
6 rooms	-0.05622	0.01173	***	-5.47
7 rooms	0.01398	0.00884		1.41
9 rooms	0.01650	0.00991	+	1.66
10+ rooms	0.00742	0.01274		0.75
2 baths	0.08490	0.00858	***	8.86
3+ baths	0.26737	0.01421	***	30.65
No fireplaces	-0.15183	0.00867	***	-14.09
2+ fireplaces	0.12314	0.01167	***	13.10
Wood exterior	-0.14950	0.00950	***	-13.89
Aluminum exterior	-0.15737	0.01170	***	-14.56
Asbestos exterior	-0.17749	0.01440	***	-16.26
Stucco exterior	-0.17818	0.01710	***	-16.32
Other exterior (except brick)	-0.19398	0.01858	***	-17.63
Dry wall interior	-0.04715	0.01787	**	-4.61
Central A/C	0.13210	0.00713	***	14.12
Forced air heating	-0.10345	0.00887	***	-9.83
Wall heating	-0.12204	0.01425	***	-11.49
Radiant heating	-0.09354	0.01590	***	-8.93
Other heating (except hot water)	-0.21375	0.01629	***	-19.25
Built 1910 or earlier	0.09591	0.02073	***	10.07
Built 1911–1920	-0.05094	0.01831	**	-4.97
Built 1921–1930	0.01132	0.01315		1.14
Built 1931–1940	0.08774	0.01145	***	9.17
Built 1951–1960	-0.02476	0.00929	**	-2.45
Built 1961–1970	0.03751	0.02142	+	3.82
Built 1971 or later	0.17868	0.02343	***	19.56
X	-0.15202	0.00459	***	-14.10
Y	0.16035	0.00385	***	17.39
X • X	-0.08667	0.00271	***	-8.30
X • Y	-0.11671	0.00470	***	-11.02
Y • Y	-0.00043	0.00328		-0.04

*Significance (two-tailed): *** = 0.001, ** = 0.01, * = 0.05, + = 0.10*

Model 2B: Near Target Area (within 5,000 feet), Interacted with Investments

R-square: 0.7013
F value (probability): 546.32 (<.0001)
Adjusted R-square: 0.7001
Degree of Freedom (corrected): 15,888

Dependent variable: Log of sales price

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
Intercept	10.88822	0.03159	***	–
Target area level	-0.34233	0.13400	*	-28.99
Target area trend	-0.03055	0.02131		-3.01
Target area post period level	-0.01526	0.12156		-1.51
Target area post level • Total cumulative block investment $1 - $20,100	0.00559	0.36182		0.56
Target area post level • Total cumulative block investment > $20,100	0.41616	0.18595	*	51.61
Target area post period trend	0.09169	0.03336	**	9.60
Target area post trend • Total cumulative block investment $1 - $20,100	0.03998	0.08170		4.08
Target area post trend • Total cumulative block investment > $20,100	-0.04583	0.04404		-4.48
5000 feet from target area level	-0.29678	0.10616	**	-25.68
5000 feet from target area trend	-0.00594	0.01771		-0.59
5000 feet from target area post period level	0.02961	0.10347		3.00
5000 feet from target area post level • Total cumulative block investment $1 - $20,100	0.47121	0.19248	*	60.19
5000 feet from target area post level • Total cumulative block investment > $20,100	-0.24942	0.35963		-22.07
5000 feet from target area post period trend	0.05580	0.02775	*	5.74
5000 feet from target area post trend • Total cumulative block investment $1 - $20,100	-0.14239	0.04789	**	-13.27
5000 feet from target area post trend • Total cum. block invest. > $20,100	0.04506	0.07544		4.61
Sale date April–June	0.05126	0.00840	***	5.26
Sale date July–September	-0.00481	0.00935		-0.48
Sale date October–December	-0.00805	0.00943		-0.80
Sale date 1991/92	0.02864	0.02945		2.91
Sale date 1992/93	-0.03047	0.03322		-3.00
Sale date 1993/94	-0.02332	0.03006		-2.30
Sale date 1994/95	-0.04410	0.03077		-4.31
Sale date 1995/96	0.02100	0.02584		2.12
Sale date 1996/97	0.03537	0.02632		3.60
Sale date 1997/98	0.10069	0.02523	***	10.59

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Model 2B: Near Target Area (within 5,000 feet), Interacted with Investments

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
Sale date 1998/99	0.16142	0.02501	***	17.52
Sale date 1999/00	0.32311	0.02461	***	38.14
Sale date 2000/01	0.37246	0.02426	***	45.13
Sale date 2001/02	0.44004	0.02437	***	55.28
Sale date 2002/03	0.53008	0.02404	***	69.91
Sale date 2003/04	0.61618	0.02551	***	85.18
Bldg/Living Area (100s square feet)	0.02129	0.00145	***	2.15
Lot Acreage	0.16386	0.03040	***	17.81
2 stories	0.08180	0.00980	***	8.5
3+ stories	-0.08705	0.01664	***	-8.34
1–5 rooms	-0.10905	0.01638	***	-10.33
6 rooms	-0.05288	0.01165	***	-5.15
7 rooms	0.01470	0.00879	+	1.48
9 rooms	0.02002	0.00983	*	2.02
10+ rooms	0.00917	0.01269		0.92
2 baths	0.08715	0.00852	***	9.11
3+ baths	0.26541	0.01421	***	30.40
No fireplaces	-0.14992	0.00864	***	-13.92
2+ fireplaces	0.11753	0.01158	***	12.47
Wood exterior	-0.14513	0.00940	***	-13.51
Aluminum exterior	-0.14685	0.01168	***	-13.66
Asbestos exterior	-0.17387	0.01436	***	-15.96
Stucco exterior	-0.17403	0.01716	***	-15.97
Other exterior (except brick)	-0.19009	0.01864	***	-17.31
Dry wall interior	-0.04734	0.01774	**	-4.62
Central A/C	0.13302	0.00711	***	14.23
Forced air heating	-0.09725	0.00887	***	-9.27
Wall heating	-0.11745	0.01431	***	-11.08
Radiant heating	-0.09209	0.01574	***	-8.80
Other heating (except hot water)	-0.20260	0.01611	***	-18.34
Built 1910 or earlier	0.11314	0.02043	***	11.98
Built 1911–1920	-0.05387	0.01829	**	-5.24
Built 1921–1930	0.00683	0.01315		0.68
Built 1931–1940	0.09145	0.01147	***	9.58
Built 1951–1960	-0.02008	0.00931	*	-1.99
Built 1961–1970	0.04166	0.02124	*	4.25
Built 1971 or later	0.18085	0.02332	***	19.82
X	-0.14238	0.00465	***	-13.27
Y	0.15993	0.00384	***	17.34
X • X	-0.08394	0.00271	***	-8.05
X • Y	-0.11529	0.00469	***	-10.89
Y • Y	-0.00583	0.00330	+	-0.58

*Significance (two-tailed): *** = 0.001, ** = 0.01, * = 0.05, + = 0.10*

Model 2C: Interacted with City and LISC Investments Separately

R-square: 0.6986 **Adjusted R-square:** 0.6973
F value (probability): 572.96 (<.0001) **Degree of Freedom (corrected):** 15,888

Dependent variable: Log of sales price

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
Intercept	10.88176	0.03142	***	–
Target area level	-0.29161	0.13479	*	-25.29
Target area trend	-0.03156	0.02140		-3.11
Target area post period level	0.00726	0.11978		0.73
Target area post level • City cumulative block investment $1 - $20,100	-0.27858	0.36248		-24.31
Target area post level • City cumulative block investment > $20,100	0.05174	0.18377		5.31
Target area post level • LISC cumulative block investment $1 - $20,100	0.80311	0.23057	***	123.25
Target area post level • LISC cumulative block investment > $20,100	0.47008	0.25246	+	60.01
Target area post period trend	0.09098	0.03278	**	9.52
Target area post trend • City cumulative block investment $1 - $20,100	0.06917	0.08289		7.16
Target area post trend • City cumulative block investment > $20,100	-0.01100	0.04384		-1.09
Target area post trend • LISC cumulative block investment $1 - $20,100	-0.13610	0.05657	*	-12.72
Target area post trend • LISC cumulative block investment > $20,100	-0.02788	0.05802		-2.75
Sale date April–June	0.04938	0.00842	***	5.06
Sale date July–September	-0.00603	0.00942		-0.60
Sale date October–December	-0.01131	0.00949		-1.12
Sale date 1991/92	0.02991	0.02950		3.04
Sale date 1992/93	-0.02740	0.03339		-2.70
Sale date 1993/94	-0.01651	0.03001		-1.64
Sale date 1994/95	-0.03435	0.03078		-3.38
Sale date 1995/96	0.02573	0.02571		2.61
Sale date 1996/97	0.04283	0.02617		4.38
Sale date 1997/98	0.10699	0.02505	***	11.29

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Model 2C: Interacted with City and LISC Investments Separately

Independent variables	Parameter Estimate	Standard Error	Level of Significance	Percent Change
Sale date 1998/99	0.17077	0.02487	***	18.62
Sale date 1999/00	0.33390	0.02441	***	39.64
Sale date 2000/01	0.38534	0.02404	***	47.01
Sale date 2001/02	0.45248	0.02414	***	57.22
Sale date 2002/03	0.54558	0.02386	***	72.56
Sale date 2003/04	0.63589	0.02530	***	88.87
Bldg/Living Area (100s square feet)	0.02117	0.00144	***	2.14
Lot Acreage	0.17100	0.03044	***	18.65
2 stories	0.07458	0.00981	***	7.74
3+ stories	-0.08802	0.01678	***	-8.43
1–5 rooms	-0.11474	0.01633	***	-10.84
6 rooms	-0.05670	0.01173	***	-5.51
7 rooms	0.01435	0.00886		1.45
9 rooms	0.01702	0.00990	+	1.72
10+ rooms	0.00756	0.01274		0.76
2 baths	0.08434	0.00858	***	8.80
3+ baths	0.26724	0.01423	***	30.63
No fireplaces	-0.15150	0.00868	***	-14.06
2+ fireplaces	0.12368	0.01166	***	13.17
Wood exterior	-0.15062	0.00948	***	-13.98
Aluminum exterior	-0.15724	0.01168	***	-14.55
Asbestos exterior	-0.17765	0.01441	***	-16.28
Stucco exterior	-0.17845	0.01710	***	-16.34
Other exterior (except brick)	-0.19435	0.01856	***	-17.66
Dry wall interior	-0.04650	0.01778	**	-4.54
Central A/C	0.13254	0.00714	***	14.17
Forced air heating	-0.10375	0.00890	***	-9.85
Wall heating	-0.12168	0.01425	***	-11.46
Radiant heating	-0.09481	0.01592	***	-9.05
Other heating (except hot water)	-0.21729	0.01625	***	-19.53
Built 1910 or earlier	0.09305	0.02070	***	9.75
Built 1911–1920	-0.04928	0.01830	**	-4.81
Built 1921–1930	0.01192	0.01312		1.20
Built 1931–1940	0.08765	0.01144	***	9.16
Built 1951–1960	-0.02531	0.00929	**	-2.50
Built 1961–1970	0.03752	0.02135	+	3.82
Built 1971 or later	0.17958	0.02338	***	19.67
X	-0.15153	0.00459	***	-14.06
Y	0.16066	0.00385	***	17.43
X • X	-0.08665	0.00270	***	-8.30
X • Y	-0.11627	0.00470	***	-10.98
Y • Y	-0.00027	0.00328		-0.03

*Significance (two-tailed): *** = 0.001, ** = 0.01, * = 0.05, + = 0.10*

A Critical Review of Alternative Methods of Measuring Neighborhood Impacts by George Galster

The subsections below begin by examining the challenges of establishing a counterfactual and neighborhood selection bias present to the program impact evaluator, in the context of reviewing previous approaches to community development impact evaluation. The AITS method is then presented in more detail in a nontechnical, graphic form.

The Challenge of Measuring Impacts of Community Development Initiatives

There are numerous challenges in trying to measure precisely the effects of place-based revitalization initiatives, which have been well-documented (Bartik, 1992; Baum, 2001; Bloom and Glispie, 1999; Erickson and Friedman, 1989; Fulbright-Anderson, Kubisch, and Connell, 1998; James, 1991; Mueller, 1995; Rossi, 1999; Taub, 1990; Weiss, 1972, 1998). These include the following:

- The intervention may not be discrete and/or may occur in multiple phases, rendering it difficult to delineate precisely pre- and post-intervention periods.
- Effects may transpire only after a significant lag.
- Effects may be difficult to measure, especially if they involve changes in attitudes and expectations.
- The most appropriate indicator(s) of effect(s) may not be obvious, or might vary by neighborhood context.
- Effects may be produced by synergistic relationships, making attributions to individual causes difficult.
- Effects may emanate over space to an extent that does not closely correspond to the boundaries established for the neighborhood under investigation.
- Effects may emanate over space to such a wide extent that "control neighborhoods" are inadvertently affected by a distant intervention.
- People who may accrue the most benefits in target neighborhoods may be most likely to leave the environs, making it difficult to measure full program benefits.

Here, however, the focus is on two problems that relate to the causal inferences that can be drawn from whatever is measured. That is, even if all the above problems were absent, inferences about whether a particular intervention caused any demonstrable difference would be challenged by *establishing the counterfactual and neighborhood selection bias.*

Arguably, the most fundamental challenge in drawing causal inferences about a community development initiative's neighborhood impact is establishing the "counterfactual situation": the patterns of an outcome indicator that *would have happened* in the neighborhood "but for" the intervention. The counterfactual must be accurately estimated because it provides the baseline of comparison against which the actual changes in the neighborhood's indicators get measured to assess the intervention's putative impact. As described below, different designs approach the estimation of counterfactual in quite different ways, with differing degrees of credibility.

Establishing the counterfactual is complicated by the closely related issue of neighborhood selection bias (Rossi, 1999). That is, the neighborhoods in which community development interventions occur are likely not a random sample of all urban neighborhoods, or even all distressed core community neighborhoods. Some may be targeted for intervention because they have certain strengths that bode well for future development potential, such as proximity to strong neighborhoods, natural amenities or vibrant anchor institutions; such was the selection rationale of the Empowerment Zone program, for example. Yet others may be targeted because they are in especially desperate circumstances. Still others undertake major community development initiatives because they have exceptionally able or politically well-connected community-based organizations there. The upshot is that methods for establishing counterfactuals must take into account the likelihood that what would have transpired in the absence of an intervention in areas targeted for programmatic impacts is not representative and thus not well-approximated by patterns in other, "generic" low-income neighborhoods.

Unfortunately, conventional methods of dealing with selection bias are inapplicable here. The usual solution either involves random assignment or a two-stage econometric model of the selection process using instruments that affect selection but not subsequent outcomes. In the case of place-based interventions, random assignment is infeasible and the modeling approach is thwarted by either small samples of intervention sites and/or a byzantine selection process that is difficult to instrument. What has been tried in the area of community development impacts, as shown in the next section, deals with the issue in an unconvincing fashion.

Alternative Methods of Establishing the Counterfactual for Community Development Interventions

Though many different labels have been applied to different research designs in the past (Shadish, Cook and Campbell, 2002), it is helpful to categorize approaches according to three criteria:

1 Do they compare indicator values that are both pre-intervention and post-intervention?

2 Do they use time-series measurements of the indicator (in either period)?

3 Do they observe absolute changes in the target neighborhood only or make comparisons relative to other comparison ("control") neighborhoods?

The discussion below briefly describes various approaches involving permutations of these criteria, provides examples from the community development literature and points out weaknesses in establishing the counterfactual. The AITS method, by estimating pre- and post-intervention slopes and levels of indicators in the target neighborhood and then comparing them with those in a control set of neighborhoods, offers a preferable specification of the counterfactual. To aid the reader, Table A1 summarizes the primary differences among the approaches and cites illustrative examples.[34]

Post-Intervention, Absolute Change Approach

This approach examines changes in an indicator transpiring in a neighborhood after some major event has occurred; direction of change is attributed to the event (Rossi, 1999). The counterfactual implicit here is that the observed change would not have occurred without the given event(s). Observations of the positive trajectories of low-income neighborhoods making reputed "comebacks" in the 1990s (typically with the help of CDCs) are representative of this approach (Blank, 2000; Grogan and Proscio, 2000; Morley, 1998; Proscio, 2002; Walsh, 1997).

Post-Intervention, Relative Change Approach

In this case, the change (or slope) in an indicator observed in the target neighborhood during the period in which an intervention is reputedly having an impact is compared to analogous changes in one or more control neighborhoods. In this approach, sometimes called "site-matching," the counterfactual is estimated by events in the control neighborhoods. Thus, only the relative advantages of the target over the control neighborhoods after the intervention are taken as evidence of impact.[35] For examples, see Weiss (1972), Vidal et al. (1986), Taub (1988, 1990), Mueller (1995), Taylor (2002) and Smith (2003).

[34] For a comprehensive treatment of this subject with an exhaustive set of illustrative studies, see Hollister and Hill (1995) and Shadish, Cook and Campbell (2002) for a discussion of quasi-experimental design techniques and illustrations from a range of fields.

[35] This approach is fundamentally consonant with a shift-share analysis (Dowall, Beyeler & Wong, 1994).

TABLE A1: Summary of Alternative Methods of Establishing the Counterfactual for Community Development Interventions

Point of Comparison	Type of Change in Target Area Indicator	
	Absolute Change	**Relative Change**
Post-Intervention	Change in indicator level or slope in target neighborhood after intervention is observed. Counterfactual is no change in indicator. Assumes that observed change is attributable to intervention. Walsh, 1997; Morley, 1998; Blank, 2000; Grogan and Proscio, 2000.	Change in indicator level or slope in target neighborhood after intervention is compared to change in level or slope in control neighborhoods (sometimes called "site-matching"). Counterfactual is change in control neighborhoods after intervention. Assumes that difference between target neighborhood change and change in control neighborhoods is attributable to intervention. Weiss, 1972; Vidal et al., 1986; Taub,1988,1990; Mueller, 1995; Taylor, 2002; Smith, 2003.
Pre/Post-Intervention	Indicator level or slope in target neighborhood after intervention is compared to level or slope in target neighborhood before intervention. Counterfactual is pre-intervention level or slope. Assumes that difference between pre- and post-intervention level or slope is due to the intervention. Weiss, 1972; Rossi, 1999; Bloom and Ladd, 1982; Bloom, 2003	Indicator level or slope in target neighborhood after intervention is compared to level or slope in target before intervention and to changes in control neighborhoods before and after intervention. Counterfactual is change in control neighborhoods before and after intervention. Assumes that "change in the differences" between target and control neighborhoods pre- and post-intervention is due to intervention. Engberg and Greenbaum, 1999; Greenbaum and Engberg, 2000; Bloom and Glispie, 1999.

Pre/Post-Intervention, Absolute Change Approach

Here, the analyst contrasts measurements of an indicator in the target neighborhood both before and after the intervention; the pre-intervention value (either level or rate of change in the indicator) is assumed to be the counterfactual (Weiss, 1972). The measurement can be based on as little as one observation of each pre- and post-intervention, or of many observations taken at short intervals during both pre- and post-intervention periods, permitting an interrupted time series analysis (Rossi, 1999). The approaches of Taub (1990) and Bloom (2003), which use few observations, contrast with that of Bloom and Ladd (1982), which uses many.

Pre/Post-Intervention, Relative Change Approach

Recently an approach has been employed that merges the prior two: pre/post-intervention change (either level or rate) in an indicator in the target neighborhood(s) is compared to the analogous change in control neighborhood(s) before and after the intervention. In this approach, the counterfactual is the change in control neighborhood(s) before and after the intervention; only inasmuch as the change in the target neighborhood differs from that in the controls will an impact be registered. There are three versions of this approach in the literature distinguished by the frequency of observations made pre- and post-intervention (Bloom and Glispie, 1999). Some evaluations use only one observation in each period, thus in effect comparing pre/post-intervention differences in levels of an indicator between intervention and non-intervention sites. Others use trends established with only two pre- and post-intervention observations, such as Engberg and Greenbaum (1999) and Greenbaum and Engberg (2000). Bloom and Glispie (1999) offer another, with frequently recurring observations that permit a richer, comparative interrupted time-series analysis.

Pre/Post-Intervention, Relative Change with Adjustment for Comparison Group (AITS) Approach

The AITS approach builds upon the logic of the pre/post-intervention, relative change approach, but adds one important enhancement: not only the slope but also the *level* of the outcome indicator is compared intertemporally and cross-sectionally. As explained in the next subsection, this seemingly minor modification offers significant advantages for reducing the ambiguity of the counterfactual. The AITS method estimates the counterfactual in two steps. First, the level and slope of the outcome indicator (estimated from frequently, sometimes simultaneously, recurring data on home sales) is extrapolated in the area affected by the intervention into the period after the intervention. Second, this extrapolation is adjusted for post-intervention changes in indicator levels and slopes in all *other* neighborhoods to control for forces not associated with the intervention that may be having larger-scale effects in other neighborhoods with similar socioeconomic conditions.

To illustrate, suppose that in Richmond one were to observe that the outcome indicator, home prices in this case, is rising at 1 percent annually in areas that from hindsight will be the target of NiB investments. By comparison, comparable homes in other neighborhoods in the city are selling from a base that (at some baseline date) is 10 percentage points higher and are rising at 2 percent annually. In the years following the NiB interventions, suppose that prices in the target areas (controlling for any differences in homes sold) jump immediately to a base that is 5 percentage-points higher than they were originally and then rise 6 percent annually on average, whereas those of comparable homes in other neighborhoods rise only 3 percent annually. Now, the counterfactual in the target areas would start by extrapolating the 1 percent growth from a low base-level into the post-NiB period. But, recognizing that prices in other neighborhoods rose one percentage point *faster* during this period than they had previously, this should also apply to the target areas. So, the counterfactual is a 2 percent annual growth in prices in the target areas that would be predicted in the absence of intervention. Because the actual growth in the target areas was 6 percent annually, one can attribute to the intervention the 4-percentage-point difference in appreciation rates. Of course, the shifting up of the post-intervention level of prices by 5 percentage points immediately after the intervention also is included as an additional effect.

Thus, the AITS approach can be thought of as equivalent to a "difference-in-differences" model.[36] In the pre-intervention period, the difference between target and control neighborhood indicators was minus 10 percentage points in level and minus 1 percentage point in appreciation rate. After the intervention, the differences change to minus 5 percentage points in level and plus 3 percentage points in appreciation rate. Since the difference in the differences changed to favor relatively the target areas in both level and appreciation of the indicator, this hypothetical demonstrates a positive effect of the intervention.

[36] This observation was first made by Schill et al. (2002).

The Comparative Advantages of the AITS Approach

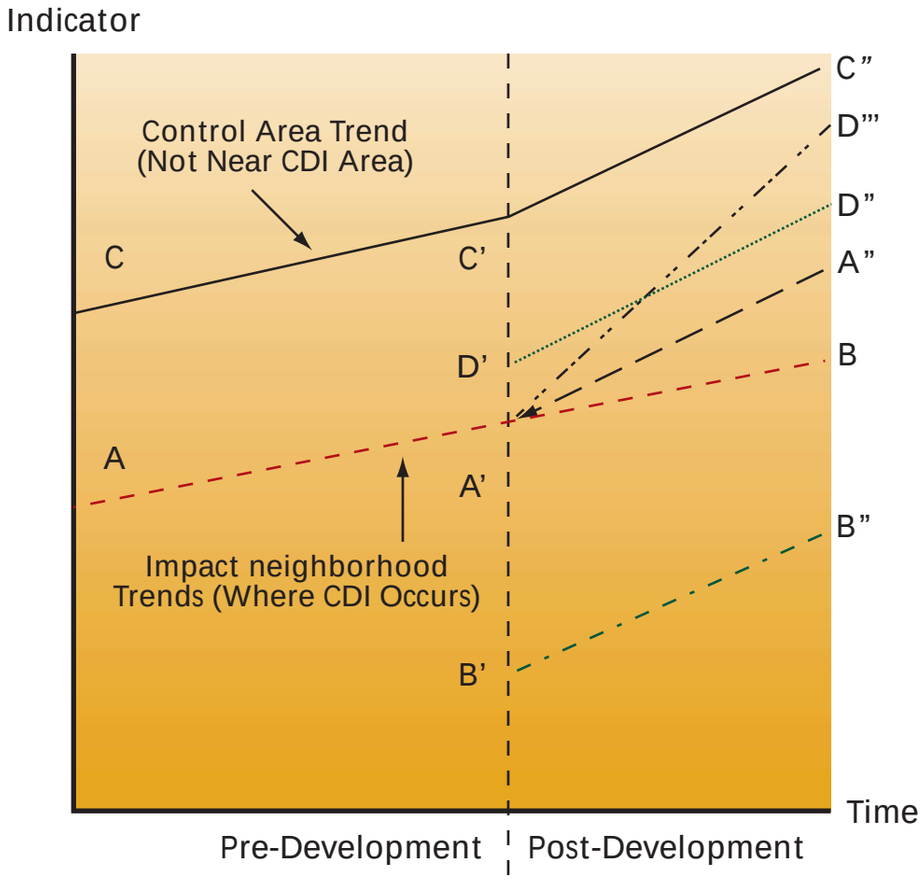
The comparative advantages of the AITS approach over other methods for establishing the counterfactual in community development impact evaluations can be demonstrated with the help of some hypothetical graphic illustrations. Consider Figure A1. It portrays hypothetical values over time for some desirable outcome indicator of interest in two sorts of geographic areas in the city under investigation. One is the "control areas," consisting of neighborhoods where no major community development initiatives are targeted during the period.[37] The other is the "target areas," where the initiative under study will commence at a time denoted by the vertical, dashed line. Assume that control area trends in the indicator are as shown by C-C'-C"; the trend break implies that some new forces affecting all neighborhoods in the city began impinging at the time corresponding to the break. Also assume that the area targeted for the initiative starts with a lower level of the indicator (A vs. C) than control areas, but changes at the same rate (i.e., A-A' parallels C-C'). This indicates that the target areas, even before the intervention, had time-invariant indicator values that were well below the control area (indicating, perhaps, a local disamenity), even though the rate of change over time before the intervention was the same in both the intervention and control areas.

The preferred specification of the counterfactual in the target areas is line A'-A": the projection of the pre-intervention slope in the target areas, adjusted for control area changes in slopes (i.e., the break between C-C' and C'-C") coincident with the pre- and post-intervention periods. Put differently, the preferred test of whether the community development initiative has an effect is whether there is a pre/post-development break in the slope (and/or shift in level) in the impact neighborhood indicator, *which is different than what was observed in the control areas.* In effect, A'-A" is the counterfactual for the target areas; it assumes that the rate of change in the indicator for the target areas would be identical to the rate of change in the control area, albeit on a lower base, created by the local disamenity.

Thus, were one to estimate empirically line A-A'-A", this would signify *no* impact, because the indicator slope break after the initiative mirrored the slope break observed in control neighborhoods (line C-C'-C"). However, if the indicator in the impact neighborhood after the initiative were to shift up to a higher level (e.g., A-A'-D'-D") and/or increase more rapidly than the control area slopes (A-A'-D'"), this would signify a *positive* impact. Conversely, if the indicator in the impact neighborhood after the initiative were to shift down to a lower level (A-A'-B'-B") and/or increase less rapidly (decrease more rapidly) than the control area slopes (A-A'-B), this would signify a *negative* impact. These arguments are summarized in Table A2.

[37] We recognize that there is nearly always some combination of ambient level of community development activities going on in nearly every low-income neighborhood. The value of the AITS method is that one does not need to worry about that, so long as one is willing to assume that in no other neighborhood(s) are there significant interventions occurring with exactly the same timing such that they would confound the average over all low-income neighborhoods. One can test this assumption by interviewing local informants. Of course, any impact evaluation design is vulnerable to idiosyncratic local events impinging on either intervention or control neighborhoods.

Figure A1: Illustration of Potential Types of Neighborhood Impacts from Community Development Initiatives



NOTE: Positive Impact, Absolute Increase in Trend: A–A'–D"
Positive Impact, Absolute Upward Shift in Level: A–A'–D–D"
No Impact, No Relative decrease in Trend: A–A'–B
Negative Impact, Relative Decrease in Trend: A–A'–B'–B"
Negative Impact, Absolute Downward Shift in Level: A–A'–B'–B"

TABLE A2: Summary of Interpretations of Implied Impact of Intervention Based on Alternatives Portrayed in Figure A1

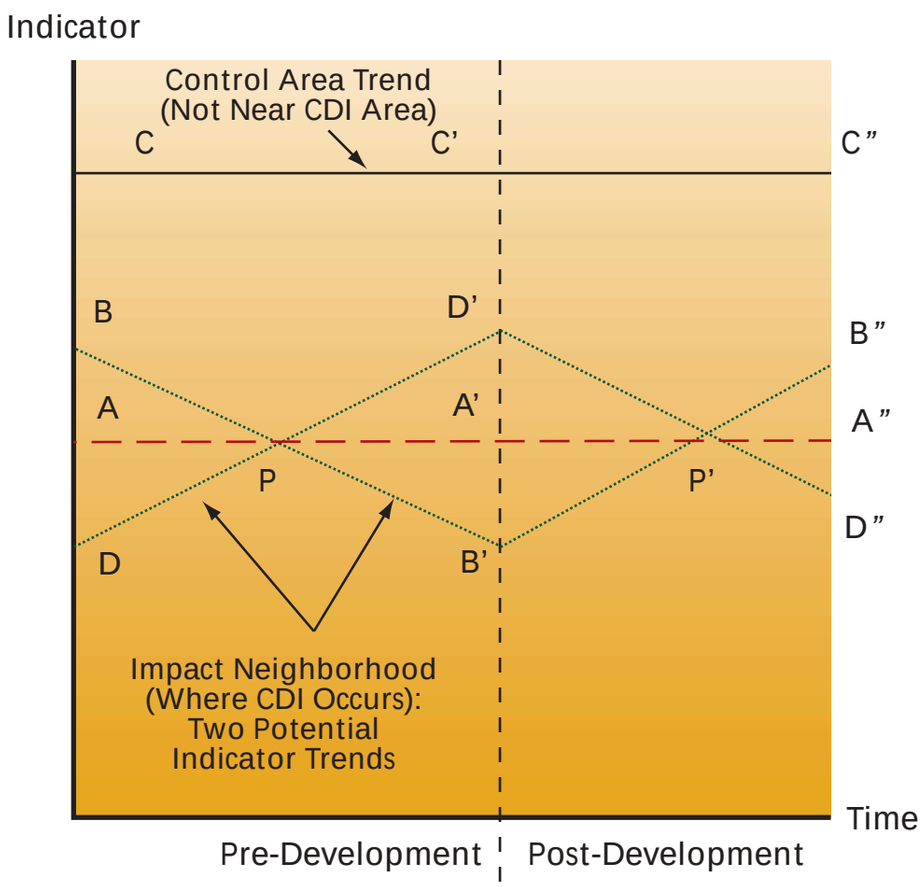
Impact Neighborhood Trend Line	Comparison of Impact and Control Neighborhood Trend Lines	Impact Finding
A–A'–D'"	Increase in slope relative to slope of control area C–C'–C". Reflects acceleration in target area slope relative to control area.	Positive Impact
A–D'–D"	Increase in level relative to level of control area at C'. Reflects upward shift in indicator value relative to control area.	
A–A'–A"	No change in slope or level relative to control area trend C–C'–C".	No Impact
A–A'–B	Decrease in slope relative to control area C–C'–C". Reflects lag of target area slope relative to control area.	Negative Impact
A–B'–B"	Decrease in level relative to control area at C'. Reflects downward shift in indicator value relative to control area.	

Contrast these conclusions to those that would have been produced from the other approaches represented in the community development literature. The *post-intervention, absolute change approach* would have erroneously concluded positive impacts if any of the target area indicator profiles shown were manifested, because all post-intervention slopes were upward. The *post-intervention, relative change approach* would have erroneously concluded no impacts if either target area indicator profiles D'–D" or B'–B" were manifested, because the slopes were identical to those in control areas. The *pre/post-intervention, absolute change approach* would have erroneously concluded a positive impact if A–A'–A" were manifested (because the target area slope break was positive) and no impact if A–A'–B were manifested (no change in target area slope).

In the case of the *pre/post-intervention, relative change approach*, the critique depends on whether there are sufficient observations to establish indicator slopes both pre- and post-intervention, or only an observed *level*. Pre/post comparisons of levels alone may obscure significantly different pre- and post-intervention slopes, thereby leading to potentially erroneous conclusions. The argument is illustrated with the help of

Figure A2. Assume for simplicity that during the period in question there is no change in the indicator in control areas (line C–C'–C"). But suppose that one also observes points P and P' and thereby deduces no change between pre- and post-intervention periods in the *average* level of the indicator in the impact neighborhood. Now only if the true, underlying slope in the impact neighborhood were A–A'–A" would this method's deduction of no impact be correct. As illustrated in Figure A2, such an observation of points P and P' might well be consistent with quite different types of pre- and post-intervention slope breaks, suggesting either strong positive (line B–B'–B") or negative (line D–D'–D") impacts.

Figure A2: Illustration of Potential Types of Neighborhood Impacts from Community Development Initiatives



NOTE: Positive Impact, Absolute Increase in Trend: B–B'–B"'
Negative Impact, Absolute Decrease in Trend: D–D'–D"

If, on the other hand, data were sufficient for estimating slopes pre- and post-intervention, the *pre/post-intervention, relative change approach* produces the correct counterfactual but a potentially biased empirical measure of impact. The problem arises through using an econometric specification permitting only a pre/post-intervention change in the slope, excluding a potential shift in the intercept at the intervention time. Referring to Figure A1, suppose the true values of the indicator are shown by segments A–A' and D'–D", suggesting a discontinuous (but ongoing) fillip of (D'–A') amount of the indicator, but no greater rate of change in the impact neighborhood as in control areas. A specification that forces a spline-like break in the estimated line at point A' would produce, however, a segment like A'–D'", which clearly overstates the rate of increase in the indicator and, hence, the positive impact measured. In sum, the AITS method avoids the potential shortcomings of the *pre/post-intervention, relative change approach* by estimating *slopes and levels* of the indicator in both the *target and control areas* both *before and after the intervention,* adjusting the former as appropriate for changes in the latter to establish the counterfactual.

It is worth reiterating that the results of any regression model do not offer conclusive proof of causation, merely association. Nevertheless, the AITS specification, by clearly comparing pre- and post-intervention differences in indicator levels and slopes (adjusted for changes in control-area slopes), provides exceptionally convincing evidence in this regard.

NOTE: References for this section are included at the end of the main article.