CENTRAL INDIANA
UNDERSTANDING THE REGION AND IDENTIFYING CHOICES
CENTER FOR URBAN POLICY AND THE ENVIRONMENT
DECEMBER 2003

Public Choices and Property Values

Evidence from Greenways in Indianapolis

What determines the price of real estate? Location. Location. Location. This cliché is a good starting point for a discussion of property values and public choices, for it leads to the question why property values vary in different locations.

Most property owners know from experience that similar properties in different neighborhoods can command vastly different prices. But many may not realize that public choices can have large effects on property values. Public choices about capital investments, public services, and taxation affect property values because their impacts vary in different places. A new highway interchange, for example, generally increases the value of nearby property because it increases its accessibility. Conversely, a decision to close a school or a neighborhood police station may decrease the value of property in the neighborhood. In public policy debates, moreover, decisionmakers often lack information about how their choices will affect property values.

Thanks to a new partnership with the Metropolitan Indianapolis Board of Realtors (MIBOR), researchers at the Center for Urban Policy and the Environment (Center) now have access to data that will help answer questions about how public choices affect property values. MIBOR has asked the Center to prepare a series of analyses of its Multiple Listing Service (MLS) sales database. Center researchers will prepare regular reports that illustrate how prices of housing, including affordable housing, vary by location and over time. In addition, Center researchers will complete independent analyses of how property values vary in response to public choices that impact different places and affect neighborhood characteristics.

This issue brief is the first of several Center reports that will explore the relationship between property values and public choices in the Indianapolis metropolitan region. In this brief, we describe the data and methods used to analyze these relationships. We show that neighborhood characteristics ranging from school quality to property taxes have significant effects on property values. Then, using greenways as an example, we illustrate the complexity of these relationships. We show that proximity to greenways generally has positive, statistically significant

Indianapolis Star Story Focuses on Monon Trail and Property Values

On November 23, the *Indianapolis Star* carried a front-page story by Bill Ruthhart titled "Developers' Urban Castles Rise Along the Monon Trail: Southern Sections Aren't Enjoying the Profits of Proximity." Ruthhart quoted developers, local officials, real estate brokers, business owners, and homeowners, and painted a balanced picture of patterns of real estate development along the trail. His sources believe that the Monon Trail has stimulated nearby real estate markets and increased property values in north central Indianapolis and in southern Hamilton County, but they also note that it has yet to spur economic development along its southern section in Indianapolis.

This issue brief explores some of the questions raised by the *Star* article. What are the effects of greenways on property values? Are the effects of all greenways the same? As the *Star* story illustrates, the answers to these questions are complex. Our analyses indicate that property values generally are correlated positively with proximity to greenways, but that when the Monon Trail is separated from other greenway trails, the effects of the other trails are not significant. More generally, we illustrate that public choices about investments can have significant effects on property values.

effects on property values and that, when summed across the city, these effects may be in the millions of dollars. We then show, however, that when particular greenways are separated out, some greenways do not appear to have significant effects on property values. In other words, some greenways clearly have enhanced property values while others may have had no effects at all. Although this result may complicate policymaking, it underscores the need for careful evaluation of the effects of public choices.

Analyzing Housing Prices

Analysts use sophisticated statistical techniques to show what realtors know intuitively: People pay more for properties in locations with good schools, nice parks, and cultural amenities. From a policy perspective, however, the important questions are: How much more are people willing to pay? Do the premiums justify investments in the public goods and services that make the neighborhood more attractive? Which public choices have the greatest effects on property values?

Economic theory suggests that the value of public factors and neighborhood characteristics, along with property and structural characteristics, are "capitalized" in the price of a property. That is, the price reflects the bundle of characteristics of both the property and its location. Relevant structural characteristics include, among others, age, square footage, the number of bedrooms, the number of bathrooms, and the number of garage bays, while relevant public goods and neighborhood characteristics include features such as school quality, property tax rate, and access to parks and other amenities. The analytic task is to separate the effects of individual characteristics, or, in other words, measure what people are willing to pay for a particular characteristic at the margin, while holding all else equal. To do this, analysts use the hedonic price approach—a statistical method for correlating the price of a property with individual characteristics. This approach involves estimating mathematical equations in which property price is estimated as a function of each relevant variable in the bundle of characteristics believed to affect price.

Use of this approach in Indiana has been limited by the lack of data about properties, public goods, and neighborhood characteristics. In most other states, analysts have obtained public data about property prices and characteristics from local tax assessors. In Indiana, however, property taxes historically have not been based on market values, so assessor's data cannot be used. This makes MIBOR's MLS data the only source for detailed information about property characteristics in the Indianapolis metropolitan region, although this fact eventually may change. If the state's ongoing change to market-based assessment is successful and township assessor's systems are computerized and integrated, the public eventually will have better access to important public records about property. With respect to location characteristics, the advent of geographic information systems (GIS) technology and software has made it feasible to include more information about public factors and neighborhood characteristics. We use GIS extensively to obtain measures for the independent variables in our analyses. These studies are some of the most comprehensive analyses of real estate sales ever completed in the Indianapolis metropolitan region.

The MLS Data

MIBOR's proprietary MLS database includes residential property sales listings, sales prices, and property characteristics for all ten counties in the Indianapolis metropolitan statistical area plus two additional counties. The Center has received copies of records for more than 130,000 listings, including records for more than 69,000 sales from the years 1999, 2000, and 2001. More than 31,000 of these records are for sales in Marion County. Approximately 200 variables potentially are available for each listing. These variables include information such as age of structure; numbers of rooms, bedrooms, and baths; square footage; garage; porch type; acres; heating system; cooling system; exterior; number of stories; and taxes. MIBOR officials estimate that their database includes 85 percent of all residential transactions in the city. In the models below, we use data for 9,348 sales for Marion County in 1999. Future analyses will include more sales from more counties and different years.[1]

Property Value Models Include More Than 20 Variables

We estimate three models that illustrate how different factors, including neighborhood characteristics and factors resulting from public choices, affect property values in Indianapolis. These models, which include 12 property and structural characteristics and as many as 12 neighborhood characteristics and public factors, vary only in the detail in which greenways are analyzed. All the models explain nearly 80 percent of the variation in sales prices. Although this means that about 20 percent of the variation is unexplained or due to random factors, this level of explanatory power is quite high for these types of models. Taken together, these models confirm that public goods like greenways have important effects on prices, but they also indicate that the relationships are complex.

Table 1 (page 4) lists the variables which are included in the models along with their average values and whether we expect that they have positive or negative effects on property values. For example, the average size of homes sold in Marion County in 1999 was 1,642 square feet. Because people will pay more for bigger homes, we expect the size of a home to correlate positively with price. Similarly, the average number of bathrooms in homes is slightly more than two in our sample. Because people prefer additional bathrooms, we again expect a positive correlation with price. Some structural characteristics, such as air conditioning, a basement, or a porch, either are present or not. For these variables, the average value represents the percentage of homes in the sample with that characteristic. For example, 15 percent of the homes sold do not have air conditioning. Because people prefer air conditioning, we expect prices for homes without it to be lower. Similarly, 85 percent of the homes sold had lots smaller than one-half acre in size. Relative to homes with lots between one-half and one acre, we expect the homes on smaller lots to sell for less. Hence, the expected relationship is negative.

With respect to neighborhood variables and other factors influenced by public choices, we believe that property prices will correlate negatively with higher property tax rates, location in Center Township, and neighborhood vacancy rates. Conversely, we expect property prices to correlate positively with neighborhood income, accessibility to employment, school test scores (both ISTEP and SAT are important), and proximity

Table 1. **Variables included in property value models (1999) (n = 9,348)**

Independent Variable	Average Value	Units/Notes	Expected Effect on Property Values
Structural Variables			
Square Feet	1,642		Positive
Number of bathrooms	2.04		Positive
No air conditioning	0.15	Value = 1 if no cooling, 0 if air conditioning	Negative
Age	36.20	Years	Negative
Number of garage bays	1.63		Positive
Basement	0.41	Value = 1 if basement, 0 otherwise	Positive
Number of rooms	7.09	Number of rooms in house	Positive
Brick facing	0.60	Value = 1 if brick facing, 0 otherwise	Positive
Porch	0.55	Value = 1 if porch,deck,or both,0 otherwise	Positive
Number of stories	1.44		Negative
Lot less than 1/2 acre	0.85	Value = 1 if lot less than 1/2 acre, 0 otherwise	Negative
Lot more than 1 acre	0.03	Value = 1 if lot greater then 1 acre, 0 otherwise	Positive
Public Choice and Neighborhood Variables			
Effective tax rate	1.17	Semi-annual taxes divided by sales price	Negative
Median neighborhood household income	51,214	Neighborhood defined as census block group	Positive
Center Township location	0.13	Value = 1 if in Center Township, 0 otherwise	Negative
Percentage of African Americans in neighborhood	0.19	Neighborhood defined as census block group	Negative
Location within 1.5 miles of Broad Ripple commercial zone	0.05	Value = 1 if located within 1.5 miles of Broad Ripple commercial zone, 0 otherwise	Positive
Accessibility to employment	99,076.35	Measured as sum of ZIP code employment weighted by distance to ZIP code from property	Positive
Household vacancy rate	0.07	Neighbor defined as census block group	Negative
ISTEP scores	57	Mean Indiana standardized school test score in school district; indicator of neighborhood school quality	Positive
SAT scores	989	Mean Scholastic Aptitude Test score in school district; indicator of school quality and neighborhood socioeconomic class	Positive
Greenway Variables			
All Greenways	0.23	Value = 1 if within 1/2 mile of greenway trail,river, or creek, 0 otherwise	Positive
Greenways with trails	0.13	Value = 1 if within 1/2 mile of greenway with trail,0 otherwise	Positive
Conservation corridor	0.12	Value = 1 if within 1/2 mile of greenway river or creek without a trail, 0 otherwise	Positive
Monon Trail	0.04	Value = 1 if within 1/2 mile of Monon Trail,0 otherwise	Positive
Other greenway trail	0.10	Value = 1 if within 1/2 mile of greenway trail except Monon Trail, 0 otherwise	Positive

to greenways. The percentage of residents in a neighborhood who are African American is included as a control variable and because of the importance of race in the housing market. Because many similar studies have found that property values are inversely correlated with the proportion of minority residents in a neighborhood, we expect a negative sign on this variable.

Problems of scale and level of aggregation complicate analyses of the effects of public goods and neighborhood characteristics on property values. For example, a neighborhood vacancy rate depends on how the neighborhood is defined. Measures of vacancy rates estimated for census block groups typically show greater variation than measures for census tracts because census tracts are larger and extreme differences tend to be averaged out. Both definitions of neighborhood boundaries differ from neighborhoods defined by local residents or city planning officials.

To illustrate the importance of the problems of scale and aggregation, our models include several variables that distinguish between types of greenways, specifically greenway corridors with multiuse trails for walking, running, cycling, and skating, and greenway conservation corridors. Greenway conservation corridors simply are place designations along rivers or streams that recognize the importance of these sensitive environmental areas. An important distinction between greenway trail corridors and conservation corridors is that conservation corridors do not have publicly accessible trails. With respect to public choices, then, the greenway trail corridors reflect choices to invest in infrastructure for pedestrians and cyclists. The conservation corridors reflect decisions to recognize natural assets, but do not necessarily reflect choices to invest in infrastructure. In each of our models, we define properties in a greenway corridor as properties within one-half mile of the central feature of the corridor. In greenway trail corridors, the central feature is a trail. In conservation corridors, the central feature typically is a river or creek.

In our first model, we include a single variable for all greenways regardless of type. This model best represents the average effects of greenways, regardless of type. In our second model, we include two variables—one that represents greenway corridors with multiuse trails and one that represents conservation corridors without trails. By distinguishing between types of greenways, this model provides information about the relative importance of trails in greenway corridors and about people's preferences for living in the two types of corridors. In our third model, we include three variables: one for the Monon Trail, the flagship trail in the Indianapolis system of greenways; one for all other greenways with trails; and one for conservation corridors. This model illustrates the relative importance of the Monon Trail in the overall system.

Location and Values of Home Sales

Figure 1 (page 6) shows the location of each of the 9,348 home sales in Marion County in 1999 that were included in the MLS database. Homes that sold in each of the 14 greenway corridors, Eagle Creek Reservoir, or Fort Benjamin Harrison are depicted with black rather than gray dots. The map illustrates that a large number of home sales occurred in Washington Township along the Monon Trail, the Canal Towpath, and the White River Conservation Corridor. Also, there are comparatively few residential property sales and no greenways in the southwestern section of the county.

Table 2 (page 7) lists the average price for all sales ($111,689) and for sales in the different types of greenway corridors. The average price for all homes sold in greenway corridors was $122,692, nearly 10 percent higher than the average price for all homes. Similarly, the average prices for all homes near greenways with trails ($114,240) and in conservation corridors ($140,586) were higher than the overall average sale price. For homes near the Monon Trail, the average sale price was 11 percent higher ($124,415) than for all homes that sold in the MLS in 1999. However, when the Monon Trail is separated from other greenways with trails, the average sale price of properties in the other corridors with trails ($111,592) is slightly lower than the overall average (less than one-tenth of one percent).

Although the average sale prices in Table 2 indicate the effects that public goods such as greenways have on property prices, we must interpret these values with care because other factors that might affect the price could be correlated with

Figure 1: **Greenway and Home Sales in Marion County (1999)**

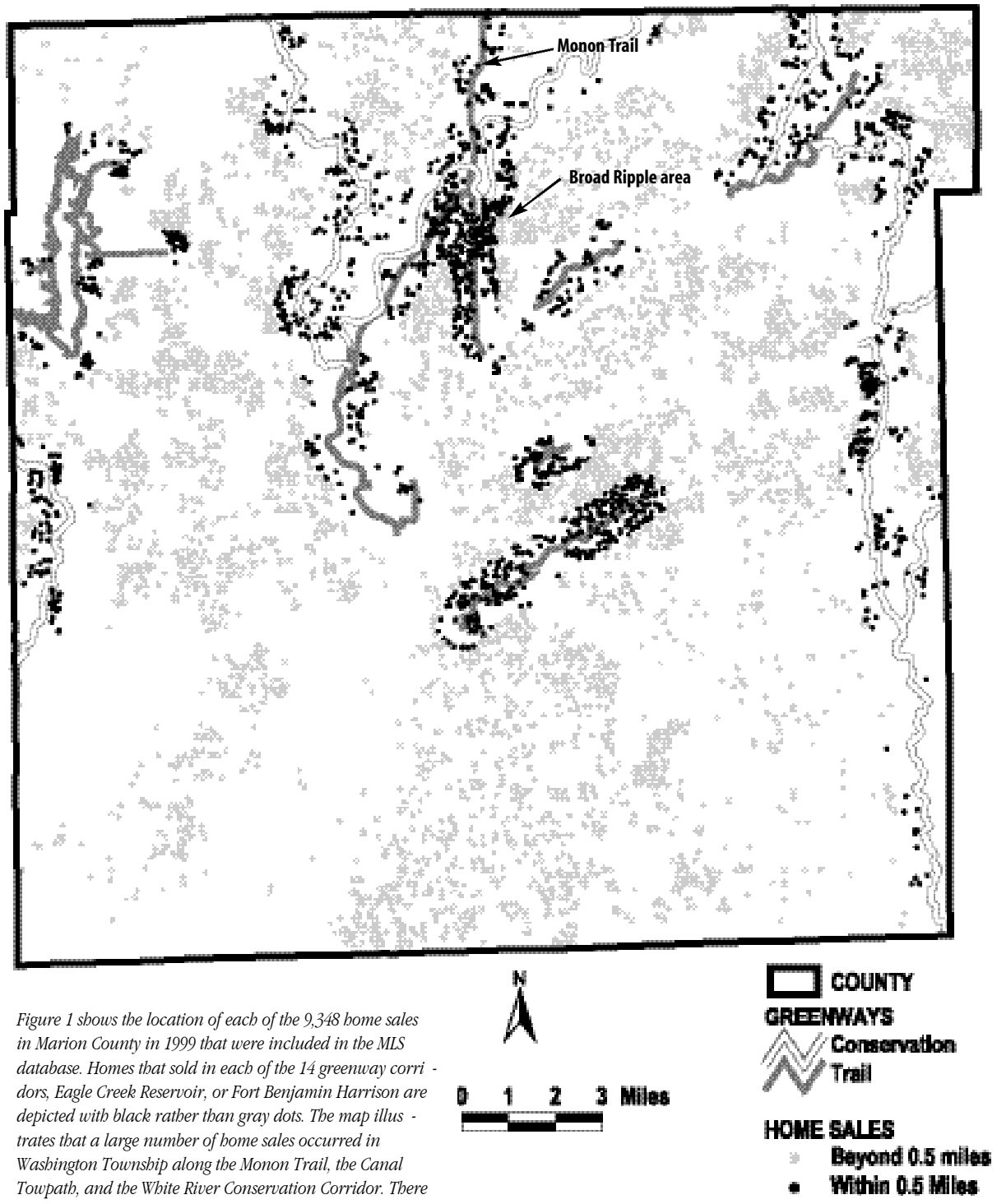

Figure 1 shows the location of each of the 9,348 home sales in Marion County in 1999 that were included in the MLS database. Homes that sold in each of the 14 greenway corridors, Eagle Creek Reservoir, or Fort Benjamin Harrison are depicted with black rather than gray dots. The map illustrates that a large number of home sales occurred in Washington Township along the Monon Trail, the Canal Towpath, and the White River Conservation Corridor. There are comparatively few residential property sales and no greenways in the southwestern section of the county.

location in a greenway corridor. For example, if all the homes in a particular greenway were built at around the same time with both basements and porches, it could be that the difference in average price really is caused by these different structural characteristics rather than by the proximity to the greenway. The analyses in Table 3 control for this type of potential bias by examining the effect of each variable while holding the effects of other variables constant.

Model Results

Table 3 (page 8) presents three models of property prices for residential property sales in Marion County in 1999. These models indicate that structural characteristics, neighborhood characteristics, and factors resulting from public choices all have statistically significant effects on housing prices. They also show that greenways, on average, are correlated with statistically significant, positive effects on housing prices. When we differentiate the greenways and estimate the effects of different types of greenways, however, some greenways have no significant effects.

Model 1 in Table 3 illustrates the effects on prices of the structural characteristics, public goods, and neighborhood characteristics when a single variable is included to represent all greenways regardless of type. Each of the 12 structural variables has an independent, significant effect on price (the t statistics all are greater than two). The values of the standardized Beta coefficients indicate that the five structural variables with the greatest effects are, in order of importance, square footage, number of bathrooms, lack of air conditioning, age, and number of garage bays. More square footage, more bathrooms, and more garage bays significantly increase price. A lack of air conditioning significantly reduces price, and, all other factors being equal, older homes sell for significantly less. These findings statistically validate the conventional wisdom of real estate agents who know that space, baths, and large garages help sell homes.

Model 1 also provides statistical validation of the importance of location. All of the neighborhood characteristics and factors related to public choices in the model also have significant effects on price. The variables with significant, positive effects on price are, in descending order of importance, neighborhood median household income, accessibility to employment, ISTEP scores, and SAT scores. Holding all other factors such as house size and school test scores equal, homes in wealthier neighborhoods still cost more. Economists sometimes refer to this phenomenon as a "snob effect." People pay more to live in wealthier neighborhoods, partly because the neighborhoods are more exclusive. From a homeowner's viewpoint, this result supports the conventional wisdom that it is better to own the least expensive than the most expensive home on a block. People also pay more to be close to work and to provide better educational opportunities for their children. These results show that both ISTEP and SAT scores have significant, independent effects on price. Model 1 provides clear evidence that public decisions that affect school quality have the potential to affect housing markets significantly.

Some neighborhood characteristics correlate with lower property prices. In terms of the effect on prices, one of the most important variables is the effective property tax rate. Higher property taxes exert negative influences on prices: As taxes increase, monthly housing payments increase, constrain-

Table 2: **Mean Values of Homes Sold in Marion County and in Greenway Corridors* in 1999**

CATEGORY	Homes Sold (% of total)	Average Value of Homes Sold
All Marion County property sales in 1999	9,348 (100%)	$111,689
Homes sold in all greenway corridors	2,157 (23%)	$122,692
Homes sold in greenway trail corridors	1,253 (13%)	$114,240
Homes sold in greenway conservation corridors	1,087 (11.6%)	$140,586
Homes sold in greenway trail corridors, excluding the Monon Trail	957 (10.2%)	$111,592
Homes sold within 1/2mile of the Monon Trail	334 (3.6%)	$124,415

** Note: We define properties in a greenway corridor as properties within one-half mile of the central feature of the corridor. In greenway trail corridors, the central feature is a trail. In conservation corridors, the central feature typically is a river or creek.*

Table 3: **Models of residential property prices in Marion County in 1999 (dependent variable = log of sales price)**

Variable	Model 1. All Greenways			Model 2. Greenways, Trail & Conservation Corridors			Model 3. Conservation Corridors, Monon Trail, Other Trail Corridors		
	B*	t statistic	Stand. Beta Coeff	B*	t statistic	Stand. Beta Coeff	B*	t statistic	Stand. Beta Coeff
(Constant)	10.249	109.64		10.237	109.63		10.108	109.73	
Structural Variables									
Square feet	0.022	30.93	0.26	0.022	31.04	0.26	0.022	32.32	0.27
Number of bathrooms	0.109	17.88	0.15	0.109	17.85	0.15	0.108	18.01	0.15
No air conditioning	–0.303	–31.37	–0.17	–0.303	–31.37	–0.17	–0.295	–31.08	–0.17
Age	–0.003	–16.91	–0.15	–0.003	–17.14	–0.15	–0.003	–18.05	–0.15
Number of garage bays	0.094	18.45	0.11	0.093	18.42	0.11	0.095	19.02	0.11
Basement	0.118	15.53	0.09	0.117	15.39	0.09	0.109	14.61	0.09
Number of rooms	0.009	4.68	0.03	0.009	4.72	0.03	0.011	5.46	0.04
Brick facing	0.050	6.95	0.04	0.049	6.87	0.04	0.048	6.85	0.04
Front porch	0.042	6.46	0.03	0.041	6.46	0.03	0.039	6.25	0.03
Number of stories	–0.019	–3.14	–0.02	–0.020	–3.26	–0.02	–0.019	–3.21	–0.02
Lot less than 1/2acre	–0.050	–4.73	–0.03	–0.045	–4.69	–0.03	–0.043	–4.59	–0.02
Lot more than 1 acre	0.130	6.91	0.04	0.130	6.91	0.04	0.134	7.28	0.04
Public Choices and Neighborhood Variables									
Effective tax rate	–0.030	–23.27	–0.11	–0.030	–23.28	–0.11	–0.030	–23.21	–0.11
Median neighborhood household income	<0.001	20.32	0.15	<0.001	19.84	0.15	<0.001	16.78	0.12
Center Township location	–0.286	–24.45	–0.16	–0.285	–24.35	–0.16	–0.224	–18.69	–0.12
Percentage African Americans in neighborhood	–0.003	–22.77	–0.13	–0.003	–22.79	–0.13	–0.003	–21.10	–0.12
Location within 1.5 miles of Broad Ripple commercial zone	—	—	—	—	—	—	0.206	12.74	0.07
Accessibility to employment	<0.001	9.15	0.08	<0.001	9.02	0.08	<0.001	5.79	0.05
Household vacancy rate	–0.006	–9.39	–0.06	–0.006	–9.24	–0.06	–0.006	–8.82	–0.05
ISTEP scores	0.002	2.27	0.02	0.002	2.38	0.02	0.004	4.81	0.04
SAT scores	<0.001	2.39	0.01	<0.001	2.50	0.01	<0.001	3.44	0.02
Greenway Variables									
All greenways	0.040	5.55	0.03	—	—	—	—	—	—
Greenways with trails	—	—	—	0.047	4.87	0.03	—	—	—
Conservation corridor	—	—	—	0.057	6.02	0.03	0.024	2.47	0.01
Monon Trail	—	—	—	—	—	—	0.140	7.82	0.04
Other greenway trails	—	—	—	—	—	—	–0.011	–1.04	–0.01
% explained (Adj. R^2)		**.79**			**.79**			**.79**	
F statistic		**1694**			**1624**			**1554**	

Interpreting the Models

Interpretation of the models requires some discussion about the meaning of different statistics. The unstandardized B coefficients are used to estimate the effect of independent variables on price, but because the units of the variables differ, they should not be interpreted in a relative way. That is, larger values of the B coefficients do not necessarily mean that a variable is more important. On the other hand, the standardized Beta coefficients do indicate the relative effect of the independent variables on price. Specifically, the Beta coefficients measure the change in the dependent variable (in standard deviations) that results from a change of one standard deviation in the respective independent variable. Therefore, the larger the value of the standardized coefficient, the greater the predictive power of the variable and the greater its impact on price. A t value of approximately 2 or higher indicates that the effects of the variable are statistically significant at a confidence level of 95 per cent or higher. In other words, if the t statistics have values greater than 2, we know with a high degree of confidence that the correlation between the variables is not random. The Adjusted R^2 statistic is an estimate of the proportion of variance in the dependent variable (that is, residential property sales price) that is explained by the equation.

ing the prices people can pay. In Marion County, after controlling for other structural and neighborhood characteristics, lower prices also correlate with both location in Center Township and with the proportion of African Americans in a neighborhood. High neighborhood vacancy rates also have statistically significant, negative effects on prices. To the extent that potential buyers believe that vacant homes are undesirable, this result suggests that elimination or reuse of vacant housing may have positive effects on neighborhood housing prices.

All greenways in the Marion County system are represented by a single variable in Model 1. All other factors being equal, people paid more for homes in greenway corridors in 1999. Although the effect of the greenways variable is positive and statistically significant, relative to other public goods and neighborhood characteristics, the effect is smaller.

We can use the results from Model 1 to estimate the "premium" that people are willing to pay for location in a greenway corridor. Holding these other factors constant, our model estimates that people paid an average of $3,731 more for homes located in greenway corridors. For the 2,157 homes sold near greenways in 1999, the total premium was over $8 million. Assuming that this premium applies to all 54,489 homes near greenways in Marion County identified through the analyses of data using GIS, the total effect of greenways on property values in Marion County is more than $203 million. Although the average effect on individual properties is fairly small, the total effect is substantial because so many homes are located in close proximity to greenways. While the recreational benefits of the greenways with trails are well known, the influence of greenways on property values is important from a policy perspective and for assessing the merits of decisions to investment in greenways.

Model 2 addresses the problems of scale and aggregation in public goods by differentiating between greenways with trails and conservation corridors without publicly accessible open space. The results of Model 2 are similar to the results of Model 1. For all of the structural and neighborhood characteristics, all the coefficients and t statistics are comparable, indicating that the same variables are statistically significant and have the same relative effects.

The new information in Model 2 concerns the relative effects of greenways with multiuse recreational trails and conservation corridors without accessible open space. Although the effects of both types of greenways are statistically significant, Model 2 indicates that the effects on housing prices of conservation corridors are slightly greater than the effects of greenways with trails. As before, we can estimate the premiums paid for location near greenways. Model 2 indicates that the average premium paid for a home within one-half mile of a greenway trail was $4,384, which, if multiplied times the number of homes sold near trails in 1999 (1,253), results in a premium of almost $5.5 million. Analyses of data using GIS indicate that there are 35,963 homes in Marion County near greenways with trails. Assuming that this average premium applies to all of them, the total increase in value is nearly $157.7 million. The comparable figures for greenway conservation corridors are $5,317 per sale, nearly a $5.8 million premium in 1999 for 1,087 sales, and a total premium of almost $127.1 million for 23,903 homes in conservation corridors. When we combine the totals for greenways with trails and conservation corridors, the combined total indicates that greenways increase property values by nearly $285 million.

Model 3 further differentiates greenways by including a separate variable for the Monon Trail, the flagship of the greenway system. Model 3 also includes a new variable for Broad Ripple Village, a thriving commercial center and popular residential district bisected by the Monon Trail. We include the Broad Ripple Village variable to distinguish its effect from the effect of the Monon Trail. The variable is statistically significant, indicating that people are willing to pay more for homes near Broad Ripple Village.

Separating the Monon Trail from other greenways produces interesting results. The Monon Trail variable is highly significant, while the variable for other greenways with trails is not and has a negative sign—the opposite of the sign we expected. The variable for the conservation corridors remains statistically significant and positive.

For homes within one-half mile of the Monon Trail, the model estimates that the sales premium is $13,059. Assuming this value is correct, the premium for the 334 sales that occurred near the Monon Trail in 1999 would be nearly $4.4 million. Approximately 8,862 households are located near the Monon Trail. If the average Monon Trail premium is assumed to apply to each household, the total increase in property values associated with the presence of the Monon Trail in Marion County is $115.7 million.

Model 3 estimates the premium for homes in conservation corridors to be $2,239, indicating a total premium for the 1,087 sales that occurred in 1999 of nearly $2.4 million. This premium, if applied to all 23,903 residential properties in the conservation corridors, would yield a total premium of $53.5 million. In contrast, the model predicts that location near other greenways with trails has a statistically insignificant ($t = -1.04$) but, from a practical perspective, small, negative effect on property values.

Scholars differ in interpretation of variables that are not statistically significant. Some scholars consider them unimportant because the lack of statistical significance implies that the effects may be random. Other scholars consider whether the direction of the effect is consistent with theory and incorporate them in analyses. In this case, although we expect greenways to have positive effects on prices, it could be possible that the effects are negative. Assuming the negative sign for the variable representing other greenways with trails is not a result of random factors, the estimated loss in value for the 957 homes sold near other trails in 1999 was less than $982,000. If we sum these negative effects across the 28,326 households in the trail corridors, the aggregated effect is a loss of approximately $29.1 million. If we assume that these average premiums (or losses) for 1999 sales for homes near the Monon Trail, other greenways with trails, and the conservation corridors apply to all residences in the corridors, the total effect in Marion County is a premium of $140.2 million.

Implications for Public Policy

These models provide useful insights into the relative effects of structural characteristics, neighborhood characteristics, and other factors affected by public choices on the prices of residential property. These models validate conventional wisdom about some of the factors important in real estate markets. Each model explains approximately 79 percent of the variation in sale prices. Among the 22 to 24 variables included in each model, variables with the greatest effects on prices are structural vari-

ables: square footage, number of bathrooms, lack of air conditioning, age, and number of garage bays. But neighborhood characteristics and public factors also have significant effects. This fact underscores the importance of public and collective efforts by government and nonprofit organizations to enhance neighborhood quality. In particular, these models indicate that initiatives and programs to enhance schools, to reduce vacant housing, and to provide recreational infrastructure such as greenways may enhance property values.

The example of greenways, however, illustrates the difficulty of speaking in generalities about the effects of types of public goods that vary in character and exist in different locations. While greenways on average may have positive effects on property prices, some individual greenways may have substantial effects, while others may have no measurable effects at all. In other words, not all greenways are the same, nor do all greenways have the same effects. These differences are illustrated clearly in the differences in effects associated with trail and conservation corridors, but also in the differences between the Monon Trail and other trails. The values associated with trail corridors probably derive from public choices to invest in infrastructure—trails for pedestrians and cyclists who use the trails for fitness, recreation, and commuting. The values associated with conservation corridors likely derive from natural assets like environmental quality, since the public choice to designate the corridors has not necessarily involved monetary investments in infrastructure or other improvements. These results may seem intuitive or even obvious, but their simple truth sometimes is ignored in policymaking where the level of generalization inherent in public debate may preclude the consideration of details about specific cases. Although analyses like these may complicate decisionmaking, they clearly illustrate the relevance and importance of policy research.

These results also complicate debates about property taxes. Although higher property taxes clearly correlate with lower property prices, the existence and quality of public goods and services supported by taxes correlate with higher prices. Hence, the relevant question is not whether property taxes are good or bad, or even whether property taxes should be raised or lowered, but instead whether the bundle of goods and services provided by local governments and the private organizations that work with them are worth the cost of the tax rate. The example of greenways again illustrates this point. The Greenways Division of the Indianapolis Department of Parks and Recreation is supported by property taxes, and the Monon Trail and other greenways were established partly with local tax revenues. Are these investments worth the burden to taxpayers? We need more data about the costs of greenways to answer this question fully, but it is clear that homes in greenway corridors on average sell for higher prices. The premium to private property owners in greenway trail and conservation corridors across Marion County likely exceeds $140 million dollars.

> *"It may not have sand and crashing waves, but the Monon Trail is the equivalent of beachfront property in the Indianapolis area."*
>
> Bill Ruthhart
> *Indianapolis Star*
> November 23, 2003

Location. Location. Location. This cliché clearly is an exaggeration: the structural characteristics of a piece of real estate affect its price. But the cliché is useful from a policy perspective for it underscores the important fact that public choices can create or diminish property values in particular places. Policy makers in Central Indiana must make difficult choices regarding investment of scarce dollars to provide essential public goods and services. Good decision-making requires consideration of all relevant factors, including the effects of public choices on property values. These analyses provide new evidence about the types of factors that affect property values in Indianapolis and Marion County. More analyses of other relevant factors will inform public investment strategies for the future.

Endnote

[1] MIBOR includes 12 counties: Boone, Brown, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Montgomery, Morgan, Putnam, and Shelby.

Central Indiana's Future: Understanding the Region and Identifying Choices

Central Indiana Region

Central Indiana's Future:Understanding the Region and Identifying Choices, funded by an award of general support from Lilly Endowment, Inc.,is a research project that seeks to increase understanding of the region and to inform decision-makers about the array of options for improving quality of life for Central Indiana residents. Center for Urban Policy and the Environment faculty and staff, with other researchers from several universities, are working to understand how the broad range of investments made by households, governments, businesses, and nonprofit organizations within the Central Indiana region contribute to quality of life. The geographic scope of the project includes 44 counties in an integrated economic region identified by the U.S.Bureau of Economic Analysis.

In cooperation with the Metropolitan Indianapolis Board of Realtors (MIBOR), researchers at the Center are investigating how prices of housing, including affordable housing, vary by location and over time in the Indianapolis area. This is the first of a series of reports on these analyses.

The Center for Urban Policy and the Environment is part of the School of Public and Environmental Affairs at Indiana University–Purdue University Indianapolis. For more information about the Central Indiana Project or the research reported here, contact the Center at 317-261-3000 or visit the Center's Web site at www.urbancenter.iupui.edu.

Authors: Greg Lindsey, director; Seth Payton,policy analyst; Joyce Man,faculty fellow;John Ottensmann,associate director, Center for Urban Policy and the Environment

CENTER FOR URBAN POLICY
AND THE ENVIRONMENT

342 North Senate Avenue
Indianapolis, IN 46204-1708
www.urbancenter.iupui.edu

INDIANA UNIVERSITY SCHOOL OF PUBLIC AND ENVIRONMENTAL AFFAIRS
INDIANA UNIVERSITY–PURDUE UNIVERSITY INDIANAPOLIS

03-C19.1