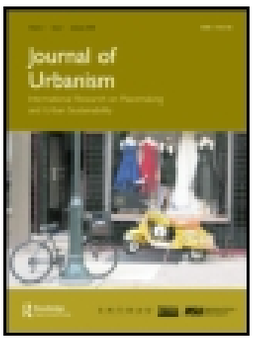

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RESEARCH PAPER

Historic preservation's impact on job creation, property values, and environmental sustainability

John I. Gilderbloom*, Matthew J. Hanka and Joshua D. Ambrosius

School of Urban and Public Affairs, University of Louisville, Louisville, KY, USA

This study examines the impacts of historic preservation on jobs, property values, and environmentalism in Kentucky and its largest city, Louisville. Kentucky is a national leader in preservation, ranking first in the White House's Preserve America initiative with 73 recognized communities. Kentucky is an ideal place to study historic preservation and environmentalism. Tax incentive programs have been an effective tool for creating positive changes in historic areas. Historic preservation results in more job creation than most other public investments. In the presence of escalating gas prices and assorted environmental practices, it is shown how neighborhoods containing historic districts have higher increases in median neighborhood housing values than undesignated neighborhoods. This paper also demonstrates the link between environmentalism and historic preservation. Residents of historic urban neighborhoods exhibit more environmentally friendly behavior.

Keywords: preservation; historic; environmentalism; sustainability; housing; jobs

Introduction

Kentucky has 73 recognized communities and neighborhoods in the Preserve America initiative, established by the White House to promote historic preservation and heritage tourism in communities across the nation. This number is higher than any other state in the country. Designation from Preserve America is significant because it provides these communities with the opportunity to apply for federal grants that benefit local preservation and tourism activities. Communities and sites are also eligible to receive Preserve America awards, which can raise their profile and bring national attention. Kentucky is an ideal place to conduct empirical analysis of historic preservation because of the numerous places that have enacted preservation laws.

Given Kentucky's status as a national leader in preservation, we explore the economic and environmental effects of historic preservation in Kentucky and its largest city, Louisville. Louisville has a number of historic preservation ordinances/districts and contains the Old Louisville neighborhood – the largest collection of Victorian-era homes in the nation, taking up three census tracts, and the third largest National Register district in the entire United States (Historic Old Louisville 2008). Specifically, we examine three impacts of historic preservation. First, we estimate the impact of historic preservation tax credits on job creation in Kentucky. Second, we isolate the effect of historic designation on neighborhood property values in Louisville. Finally, we examine the environmental impacts of historic preservation – presenting statistical findings on individuals' behavior and theorizing the connections between preservation and environmentally friendly lifestyles and culture.

*Corresponding author. Email: jigild01@louisville.edu

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Historic preservation tax incentives and job creation

Kentucky tax credit program

The Kentucky legislature established a state historic tax credit for historic preservation in 2005, after years of lobbying by the preservation community. Recognized for its economic development potential, the historic tax credit program was a key component of the JOBS for Kentucky Tax Modernization Plan, which then-Governor Ernie Fletcher signed into law in March 2005. Kentucky is now one of only 27 other states in the nation offering a state-level tax incentive for historic preservation. State tax credits are available for both commercial and residential rehabilitation projects for properties listed on the National Register of Historic Places.

Thirty percent of qualified rehabilitation expenses are available as a State Tax Credit for owner-occupied residential properties. The minimum investment is US$20,000 and the total credit cannot exceed US$60,000. Twenty percent of qualified rehabilitation expenses are available for commercial and rental housing, not to exceed US$400,000 per project. A total of 172 historic rehabilitation projects have been reviewed through this program since its implementation in 2005. In total, this tax credit amounts to a projected investment of US$171,112,857 in historic rehabilitation in Kentucky. To validate this projection further, we contacted the Coordinator of the Kentucky Historic Preservation Tax Credit Program with the Kentucky Heritage Council. So far the Kentucky Heritage Council has approved and completed projects that have added up to US$126,580,971 and are expected to increase to the original projected investment amount (Gilderbloom and Hanka 2009). This tax credit has been so successful that advocates expect the Commonwealth will increase the tax credit from US$3 million to US$5 million. Projects include 76 commercial and 96 single-family, owner-occupied residential structures.

An economic study of historic rehabilitation in Bowling Green, Kentucky, concluded that every US$1 million invested in the rehabilitation of a property, state and local governments have seen a combined increase of US$184,000 in new revenue (Kentucky Heritage Council 1988, 2007).

Federal tax credit program

The Kentucky Heritage Council also coordinates one of the most successful Federal Tax Credit programs in the United States. For the last two years, Kentucky ranked 14th nationwide for the number of historic properties rehabilitated using this incentive (National Park Service, Heritage Preservation Services Division 2006a, 2006b). In 2006, the federal historic preservation tax program reached a new record of US$4 billion in private investment spending, with 1253 projects approved. Since this program began in 1976, federal tax incentives have prompted the restoration and rehabilitation of nearly 34,000 historic structures nationwide, and a total private investment leveraging US$40.83 billion (National Park Service, Heritage Preservation Services Division 2006a).

Tourism is the state's third largest industry and second largest employer. According to a report by the Travel Industry Association (TIA), visitors to Kentucky spent more than US$10 billion in 2006, the first time in the state's history, a nearly 7% increase from the year before (Gilderbloom *et al.* 2008). Our published data also show that 176,800 Kentuckians were employed due to tourism, earning more than US$3.36 billion in payroll income and paying more than US$987 million in federal, state, and local taxes (Kentucky Department of Tourism 2007). The success of Kentucky's tourism industry is partially due to the

wealth of unique historic resources available to visitors. Heritage sites are vital tourism attractions and help to stimulate local economies in nearly every county in the state.

Methodology

We utilize a respected job-multiplier simulation model to quantify the economic impact which determines the direct, indirect, and total effects of an external infusion of funds for historic preservation efforts. This simulation model, developed by Rutgers University for the National Park Service, is called the Preservation Economic Impact (PEI) model. Based on real case studies of job creation put into a computer simulation model, this software calculates the total economic impact of historic preservation, determining both the direct and multiplier effects of rehabilitation. The labor and materials used specifically to purchase or rehabilitate a historic home would be considered a direct effect. On the other hand, the multiplier effect consists of any indirect impacts, meaning any money spent on goods and services by the construction industries that produce the rehabilitation materials (National Park Service 2006a,b).

Job creation findings

Historic preservation results in more job creation than most other kind of investments. According to Donovan Rypkema, investment in new construction creates 40 jobs per US$1 million compared with an investment in historic rehabilitation, which results in anywhere from 43 jobs per US$1 million (Rypkema 1997) to 49 new jobs per rehabilitation project (National Park Service, Heritage Preservation Services Division 2006a). We used a more conservative estimate derived from the Preservation Economic Impact Model (PEI) developed by Rutgers University Urban Planning Program and the National Park Service. According to the PEI model in Table 1, 7365 jobs were created as a result of Kentucky State Tax Credits program from 2005 to 2007, resulting from direct, indirect, and induced effects of the US$171 million spent. From this investment, the PEI approximates that US$229 million of income was generated and total gross domestic product was US$356 million. The multiplier effect of State Tax Credits is 43 – so for every US$1 million dollars spent on State Tax Credits, 43 jobs were created.

According to Table 2, the Main Street Program in Kentucky has produced 4720 jobs, resulting in approximately US$149 million in income, and a total gross domestic product of over US$237 million in 2006. According to the model, every US$1 million spent on Main Street reinvestment results in approximately 29 new jobs. Out of the US$292 million spent on Main Street reinvestment in 2006, including approximately US$128 million in private investment, US$70 million in public improvements (e.g., streetscape), and nearly US$95 million in new construction, 8468 jobs were created.

The PEI job creation estimates are just the tip of the iceberg, since there are hundreds who are employed maintaining, restoring, and upgrading thousands of historic homes around Kentucky. For this reason, most Kentucky preservationists see a large economic return (87%), and another 81% see potential job growth from preserving the physical built environment heritage of our ancestors (Gilderbloom *et al.* 2008). This translates to the following:

- State Tax Credits: US$171 million investment results in 7365 jobs between 2005 and 2007.

Table 1. PEI model for Kentucky state tax credits, 2005–2007.

	Economic component		
	Employment (jobs)	Income (000$)	Gross domestic product (000$)
I. TOTAL EFFECTS (direct and indirect/induced)*			
Private			
1. Agriculture	56	1,030.0	4,054.0
2. Agricultural services, forestry & fishing	125	2,970.0	3,597.0
3. Mining	75	3,185.0	7,893.0
4. Construction	2,372	64,090.0	74,686.0
5. Manufacturing	1,166	41,679.0	69,088.0
6. Transportation & public utilities	414	15,114.0	32,524.0
7. Wholesale	313	13,079.0	22,020.0
8. Retail trade	984	16,779.0	26,834.0
9. Finance, insurance, & real estate	568	29,223.0	52,592.0
10. Services	1,260	39,863.0	60,303.0
Private subtotal	7,333	227,010.0	353,591.0
Public			
11. Government	32	1,945.0	2,818.0
Total effects (private and public)	7,365	228,955.0	356,409.0
II. DISTRIBUTION OF EFFECTS/MULTIPLIER			
1. Direct effects	3,027	89,023.0	117,032.0
2. Indirect and induced effects	4,339	139,932.0	239,377.0
3. Total effects	7,365	228,955.0	356,409.0
4. Multipliers (3/1)	2.433	2.572	3.045
III. COMPOSITION OF GROSS STATE PRODUCT			
1. Wages-net of taxes			174,915.0
2. Taxes			
a. Local/State			31,426.0
b. Federal			
General			21,678.0
Insurance trusts			17,649.0
Federal subtotal			39,327.0
c. Total taxes (2a+2b)			70,753.0
3. Profits, dividends, rents, and other			110,741.0
4. Total gross state product (1+2+3)			356,409.0
EFFECTS PER MILLION DOLLARS OF INITIAL EXPENDITURE			
Employment (jobs)			43.0
Income			1,338,038
Local/State taxes			183,657
Gross state product			2,082,890

Note: Detail may not sum to totals due to rounding.
*Terms:
Direct effect (state)–the proportion of direct spending on goods and services produced.
Indirect effects–the value of goods and services needed to support the provision of those direct economic effects.
Induced effects–the value of goods and services needed by households that provide the direct and indirect labor.

Table 2. PEI model for Kentucky's main street program, 2006.

	Economic component		
	Employment (jobs)	Income (000$)	Gross domestic product (000$)
I. TOTAL EFFECTS (direct and indirect/induced)*			
Private			
1. Agriculture	33	607.0	2,434.0
2. Agricultural services, forestry & fishing	32	797.0	936.0
3. Mining	31	1,300.0	3,397.0
4. Construction	1,410	38,046.0	44,407.0
5. Manufacturing	781	29,197.0	47,023.0
6. Transportation & public utilities	261	10,101.0	22,845.0
7. Wholesale	231	9,708.0	16,206.0
8. Retail trade	641	10,830.0	17,412.0
9. Finance, insurance, & real estate	408	20,490.0	40,281.0
10. Services	866	26,423.0	40,383.0
Private subtotal	4,695	147,501.0	235,326.0
Public			
11. Government	25	1,494.0	2,173.0
Total effects (private and public)	4,720	148,995.0	237,498.0
II. DISTRIBUTION OF EFFECTS/MULTIPLIER			
1. Direct effects	1,877	56,321.0	79,286.0
2. Indirect and induced effects	2,843	92,674.0	158,212.0
3. Total effects	4,720	148,995.0	237,498.0
4. Multipliers (3/1)	2.515	2.645	2.995
III. COMPOSITION OF GROSS STATE PRODUCT			
1. Wages-net of taxes			114,544.0
2. Taxes			
a. Local/State			21,758.0
b. Federal			
General			14,570.0
Insurance trusts			11,683.0
Federal subtotal			26,252.0
c. Total taxes (2a+2b)			48,010.0
3. Profits, dividends, rents, and other			74,944.0
4. Total gross state product (1+2+3)			237,498.0
EFFECTS PER MILLION DOLLARS OF INITIAL EXPENDITURE			
Employment (jobs)			28.7
Income			907,365
Local/state taxes			132,502
Gross state product			1,446,345

Note: Detail may not sum to totals due to rounding.
*Terms:
Direct effect (state)–the proportion of direct spending on goods and services produced.
Indirect effects–the value of goods and services needed to support the provision of those direct economic effects.
Induced effects–the value of goods and services needed by households that provide the direct and indirect labor.

- Federal Tax Credits: US$52 million investment results in 2236 jobs in 2006.
- Main Street Program: US$292 million investment results in 4720 jobs in 2006.
- Heritage Tourism: total budget of US$96 million and employs 2700 Kentuckians in 2002.

In 2007, the Commonwealth of Kentucky approved a tax incentive package to the Ford Motor Company totaling US$66 million over a ten-year period to support the expansion of facilities and operations at the Kentucky Truck Plant (Office of the Governor 2007). Also in 2007, the General Assembly passed legislation providing Peabody Energy of St. Louis, Missouri, US$250 million in tax incentives to create a coal gasification plant in Western Kentucky (Steitzer 2007). If these types of incentive packages were similarly offered to historic rehabilitation work, the positive effects to Kentucky's economy would be substantial. Using the PEI job multiplier of 43 jobs for every US$1 million invested in historic preservation, 2838 jobs would be created over the next ten years for the same amount the state gave to Ford in 2007, or roughly 284 jobs per year. For the amount the state is paying Peabody Energy to locate a plant in the state, 10 750 jobs would be created using the PEI multiplier. Local estimates on job generation can average much higher. These estimates are often "guesstimates" based on simplistic assumptions. These high estimates are driven by competition of other cities trying to demonstrate the biggest "bang for the buck."

Historic districts and residential property values

Literature review

The bulk of the literature about local and National Register historic districts shows that property values rise faster than in unprotected or undesignated neighborhoods. The value of each "historic" home is protected by controls on the exterior of the house or by mandating that the house be well maintained using historic paint colors and materials. Property values are further protected by an assurance that other nearby properties will maintain their historic character and never be demolished, which limits negative externalities. Most studies have shown a positive correlation between property value increases and historic preservation (Ford 1989, Rypkema 1994, Shipley 2000, Leichenko *et al.* 2001, Coulson and Lahr 2005, Mason 2005, Gilderbloom 2008, Gilderbloom *et al.* 2008). Haughey and Basolo (2000) found that a federal historic preservation district by itself has a positive impact on property values, but when there is an overlapping restrictive law, values may decrease. Rypkema's (1997) study of a city in Indiana showed that five neighborhoods protected by local historic zoning ordinances in the state did better overall in property appreciation than similar, unprotected neighborhoods. Florida (2002) and Rypkema (2006) both focus on the powerful relationship between preservation and economic development. Incidentally, past research found that central cities do more historic preservation than suburban jurisdictions (Green and Fleischmann 1991, p. 150).

However, it should be noted that not all studies confirm a positive impact of preservation efforts. In some cases, local historic preservation ordinances have caused a loss in property appreciation (Asabere *et al.* 1994, Haughey and Basolo 2000). Haughey and Basolo suggest that stringent local regulations, as opposed to federal designation, can cause property values to fall in historic districts. Another study of historic preservation in Charleston, South Carolina, found that housing of the lowest quality in a district experiences negative returns as a result of historic preservation (Lockard and Hinds 1983). Lockard and Hinds find that historic housing of the highest and medium quality tends to see a positive impact from historic preservation.

Question, data, and methods

Given the literature's contradictory findings, we reexamine the impact of historic preservation on neighborhood property values using data for the 170 census tracts in Louisville. We review the summary statistics for preservation neighborhoods and then ask the following. Do these neighborhoods with historic designation experience higher housing values than other neighborhoods, holding key housing and socio-demographic characteristics equal? Furthermore, have these neighborhoods containing historic districts appreciated at a higher rate over the recent housing boom (2000–2006)?

To answer these questions, we combine housing values from the Jefferson County Property Valuation Administrator (PVA), transaction prices from the Board of Realtors' Multiple Listing Service (MLS), and 2000 Census data to construct regression models predicting house values/prices and percentage increases (United States Census Bureau 2000). The assessed value of every property in Louisville Metro was geocoded by census tract and a neighborhood median value was calculated by the Kentucky State Data Center, for both 2000 and 2006. The sales price of every property sold in 2006 was geocoded by census tract and a neighborhood median price was calculated by the authors. The percentage increase in median assessed value from 2000 to 2006 was also calculated for each census tract.

We perform ordinary least-squares (OLS) regression analysis using housing value/price (PVA and MLS) or percentage increase in housing value (PVA) as the dependent variable and the census variables as the independent controls. The test independent variable is a dummy variable identifying the ten census tracts containing a historic preservation district. Since the unit of analysis is census tract – a proxy for neighborhood – every tract containing a historic preservation district was coded "1", while those not containing a district are coded "0". While the historic districts do not necessarily overlap perfectly with the census tracts, in most cases they cover a majority of the tract's land area. Control variables are standard neighborhood and socio-demographic controls, many of which offer competing explanations for the market success of historic districts. These include: excess supply (vacancy rate), the presence of historic architecture (age in years), the size of housing (median rooms), racial composition (nonwhite percent), the proximity to employment (employment density, i.e. jobs per square mile), the percent of same-sex households, and the proximity to the central business district (CBD; miles).

We test the models for multicollinearity and spatial dependence. While both are present, to some degree, in the models, we do not believe they significantly affect our conclusions. To check for excessive multicollinearity, we examine tolerance scores which are presented in the regression results (Tables 4–6). All tolerance scores exceed 0.20 – which, admittedly, is a generous cutoff point. However, most tolerance scores greatly exceed the cutoff and all independent variables are warranted and capture disparate phenomenon. Housing age and distance from the CBD are most-highly correlated and thus have the lowest tolerance scores in the 0.20s. We use GeoDa to check for spatial dependence (Anselin *et al.* 1996). While spatial autocorrelation is a concern, spatial lag or error modeling offer miniscule improvements in model fit and they do not entirely eliminate spatial bias. In addition, parameter estimates are only slightly altered, which results in the same or similar conclusions concerning individual variables' significance, direction, and effect sizes. For brevity's sake, we present only the OLS results in this paper.

Property value findings

We start with a presentation of a map showing percent change in neighborhood housing value from 2000 to 2006. Certain downtown Louisville neighborhoods experienced value

increases of near or even exceeding 100% between 2000 and 2006, while many neighborhoods farther from downtown remained stagnant. This trend is evident in the map of percent increases in median housing value over this seven-year period (Figure 1). Many of the darker neighborhoods situated around the CBD are sites of historic preservation efforts or other housing interventions (HOPE VI or university–community partnerships). Eight of the ten highest property value increases are located within the perimeters of Louisville's inner beltway (I-264, the Watterson Expressway), while the ten neighborhoods with the lowest increases are located outside the inner beltway and some even beyond the outer beltway (I-265, the Gene Snyder Freeway).

Table 3 displays the numbers of properties, property values, and changes from 2000 to 2006 for the ten census tracts containing Louisville's historic preservation districts. On average, these ten neighborhoods exceeded the market performance of the non-designated neighborhoods. The average percent increase in median value for historic district neighborhoods was 58%, while non-historic neighborhoods in Louisville averaged a 32% increase. Eight out of the ten historic district neighborhoods were in the top 15% in terms of increases. The other two historic districts, Limerick and Cherokee Triangle, were in the top 50%.

A regression analysis was conducted to examine whether these above-average increases persist when controlling for other factors. The historic district dummy variable is indeed positive and significant in all three models (Tables 4–6). In model one, which predicts median assessed value, historic designation accounts for an additional US$59,000 in median value for 2006, holding the control variables equal (Table 4). While our other research finds that assessment data compare favorably with sales prices and US Census housing data, model two confirms that this is not a "fluke" produced by the use of assessment data (Gilderbloom *et al.* 2009). Median residential properties located in neighborhoods containing historic districts on average sold for US$67,000 more than those without districts in

Figure 1. Percent change in neighborhood median assessed value, 2000–2006.

Table 3. Property value increases in historic preservation district neighborhoods in Louisville, KY, 2000–06.

Neighborhood	Residential properties, 2000	Median assessed value, 2000 (US$)	Residential properties, 2006	Median assessed value, 2006 (US$)	Change in residential properties, 2000–06	Change in median assessed value, 2000–06 (US$)	Change in median assessed value, 2000–06 (%)	Rank
Butchertown	557	30,230	542	59,675	–15	29,445	97	3
Old Louisville	451	92,580	464	162,825	13	70,245	76	6
Old Louisville	63	77,360	59	127,300	–4	49,940	65	14
Old Louisville	496	61,115	504	97,600	8	36,485	60	16
Parkland	1,233	29,790	1,254	47,000	21	17,210	58	17
Parkland	1,100	26,760	1,125	40,940	25	14,180	53	20
Clifton	1,222	53,560	1,240	81,715	18	28,155	53	21
Limerick	327	75,900	313	112,620	–14	36,720	48	25
Limerick	68	60,380	58	83,645	–10	23,265	39	44
Cherokee Triangle	785	184,590	736	240,170	–49	55,580	30	86
Averages, preservation neighborhoods	630	69,227	629	105,349	–1	36,123	58	
Averages, non-preservation neighborhoods	1,349	89,838	1,453	117,726	110	26,894	32	

Note: These ten neighborhoods were identified from the Louisville Metro government's Historic Landmarks and Preservation Districts Commission website (http://www.louisvilleky.gov/PlanningDesign/Historic+Landmarks+and+Preservation+Districts+Commission.htm) as those containing historic preservation districts. The West Main Street district is not included because of a lack of accurate residential property assessment data for the central business district (CBD) tract.

2006, all things being equal (Table 5). Not only are these protected homes worth more, they are apparently better investments as well. Table 6 reports that the ten historic neighborhoods indeed saw higher increases over the seven-year housing boom (2000–2006). Historic district neighborhoods saw an additional 21 points in appreciation in their median housing value over this period. In other words, these neighborhoods increased above and beyond the level predicted by their housing and socio-demographic characteristics.

Of additional note is the significant, negative effect of housing age in all three models (which may take a "U"-shape if age-squared were added to the equation). It is accepted knowledge that older housing tends to be worth less than newer units, particularly those in disrepair, unless substantial renovation is undertaken. These regression results confirm that historic preservation incentives flip the effect of older stock in those neighborhoods with designated districts. We also performed a regression (not shown) run where a historic district was removed from the regression equation that protected only six commercial buildings in these two census tracts. This preservation district is unique because the eight other districts protected nearly all the properties within that census tract. Once this was done, median neighborhood properties were sold for US$29,000 more than the original finding of US$67,000. Consequently, the unstandardized regression coefficient shows a neighborhood housing value increase of US$83,000 instead of a median neighborhood assessed value of approximately US$59,000.

Preservation and environmental sustainability

Theorizing the lost connection

A decade ago, few recognized the connection between sustainable neighborhoods and historic preservation. The 1992 United Nations Earth Summit in Rio de Janeiro, Brazil, defined sustainable development as the means of providing for the basic necessities of life, such as food, education, jobs, worship, transportation, and safety, to meet our needs today while enabling future generations to meet their needs (United Nations 1992).

A sustainable neighborhood is, by default, a historic neighborhood designed before the invention of the automobile or air-conditioning. The layout of these neighborhoods placed stores, churches, schools, jobs, and recreation in close proximity to one another. Houses were designed with high ceilings, transoms, and operable windows, which now provide contemporary residents with an energy-conscious alternative to modern heating and cooling systems. These types of neighborhoods have lasted from past generations to the present and will allow future generations to live, work, and play there.

A sustainable neighborhood is one that preserves the past for the present and future generations. Restoring these beautiful buildings is an important environmental act. Historic preservation is a natural ally of environmentalism, which provides residents the opportunity to reduce their carbon footprint by refraining from excessive automobile and high-cost energy use. An historic neighborhood is a healthier neighborhood because many of its citizens are more active (Gilderbloom *et al.* 2008).

Older neighborhoods and newer housing have been compared in terms of the ease of commuting from home to school, work, recreation, shopping, or public transportation outlets (Rypkema 2002, pp. 7–9). Older neighborhoods are in closer proximity to work (i.e., CBD employment and other urban job centers) and places of recreation and leisure. According to the American Housing Survey (1999), 42% of all historic house residents were within 5 miles of their work, compared with 23% of people living in new housing constructed within the past four years. Similarly, two-thirds of those living in older neighborhoods were within 1 mile of an elementary school with a 25% drop for those living in new houses

Table 4. Historic preservation's impact on neighborhood median assessed value, 2006.

	B	Standard error (SE)	Beta	*t*	*p*	Tolerance
(Constant)	−16.170	30.249		−0.535	0.594	
Vacant percent, 2000	1.420	0.919	0.090	1.546	0.124	0.525
Median housing age, 2000	−1.656	0.297	−0.408	−5.576	0.000	0.334
Median number of rooms, 2000	42.567	3.446	0.706	12.353	0.000	0.546
Percent of non-white residents, 2000	−0.867	0.124	−0.408	−6.965	0.000	0.519
Employment density (jobs per square mile), 2000	0.003	0.002	0.097	1.719	0.088	0.563
Percent of same-sex households, 2000	9.827	7.293	0.062	1.347	0.180	0.840
Distance to the central business district (CBD) tract (004900) (miles)	−4.549	1.347	−0.295	−3.378	0.001	0.235
Contains historic preservation district (dummy, 1/0)	59.185	13.151	0.228	4.500	0.000	0.695

Note: Dependent variable: median assessed value (US$, thousands), 2006; $n = 168$; adjusted $R^2 = 0.702$.
Sources: Jefferson County PVA and US Census.

Table 5. Historic preservation's impact on neighborhood median sales price, 2006.

	B	Standard error (SE)	Beta	*t*	*p*	Tolerance
(Constant)	−84.556	42.215		−2.003	0.047	
Vacant percent, 2000	1.801	1.357	0.081	1.327	0.186	0.513
Median housing age, 2000	−1.566	0.456	−0.269	−3.436	0.001	0.313
Median number of rooms, 2000	56.387	4.919	0.669	11.463	0.000	0.564
Percent of nonwhite residents, 2000	−1.347	0.182	−0.445	−7.392	0.000	0.530
Employment density (jobs per square mile), 2000	0.010	0.001	0.468	8.931	0.000	0.700
Percent of same-sex households, 2000	16.035	10.679	0.072	1.502	0.135	0.835
Distance to the central business district (CBD) tract (004900) (miles)	−5.005	1.964	−0.232	−2.548	0.012	0.232
Contains historic preservation district (dummy, 1/0)	67.417	18.581	0.176	3.628	0.000	0.816

Note: Dependent variable: median sales price (US$, thousands), 2006; $n = 167$; adjusted $R^2 = 0.681$.
Sources: MLS and US Census.

Table 6. Historic preservation's impact on percent change in neighborhood median assessed value, 2000–06.

	B	Standard error (SE)	Beta	*t*	*p*	Tolerance
(Constant)	38.267	15.769		2.427	0.016	
Median assessed value (US$, thousands), 2000	−0.283	0.054	−0.599	−5.285	0.000	0.272
Vacant percent, 2000	2.566	0.479	0.439	5.357	0.000	0.521
Median housing age, 2000	−0.817	0.168	−0.542	−4.878	0.000	0.284
Median number of rooms, 2000	9.928	2.498	0.444	3.975	0.000	0.281
Percent of nonwhite residents, 2000	−0.083	0.076	−0.106	−1.100	0.273	0.379
Employment density (jobs per square mile), 2000	0.000	0.001	0.021	0.260	0.795	0.547
Percent of same-sex households, 2000	2.914	3.827	0.050	0.761	0.448	0.825
Distance to the central business district (CBD) tract (004900) (miles)	−2.316	0.725	−0.405	−3.194	0.002	0.218
Contains historic preservation district (dummy, 1/0)	21.079	7.057	0.219	2.987	0.003	0.651

Note: Dependent variable: percent change in median assessed value, 2000–06 (ratio*100); $n = 167$; adjusted $R^2 = 0.419$.
Sources: Jefferson County PVA and US Census.

(39%). The percentage of those that shop within 1 mile of their home was 62% for older neighborhoods versus 41% for new neighborhoods. In terms of the availability of public transportation, 59% had easier access in older neighborhoods versus 26% in newer developments. Finally, the amount of affordable housing was about 20% greater in older neighborhoods.

Houses built in the 1800s were designed without the need for air-conditioning. In the 19th century, homes were designed with 10–14-foot ceilings to allow hot air to rise and escape through door transoms, cooling the first floor on hot summer nights. Large attics, ranging anywhere from 8 to 16 feet, were built to capture the hot air, and large basements were built to keep perishables cool in the summer. Also, working-class "shotgun" and "camelback" houses were built with raised floors and high walls that helped cool the buildings. The basements were often used for storage along with providing protection against inclement weather.

With new advances in energy conservation, including insulation materials, fan and duct systems, and energy-efficient air-conditioning, liberating the transom, preservationists are able to create new spaces out of these unused spaces – whether it is an in-law apartment, a private refuge for either a "man's space" or a "woman's space", pool playing, working out, a home office, or a rental unit to bring in revenue. Energy costs from these attic or basement spaces can be significantly lower if one uses passive solar design, fans, insulation, and proper ventilation. Our survey found that the majority of Kentucky preservationists believe owners should be allowed to convert basements, garages, and attics into additional housing in historic buildings (64%) (Gilderbloom *et al.* 2008).

As we have shown elsewhere, the preservation of historic housing is strongly associated with the creation of affordable rental housing because it is profitable and increases property values. That is why preservationists in Kentucky (eight of ten) claim it is a more profitable return on investment than other kinds of investments (Gilderbloom *et al.* 2008). Moreover, the cost of rehabilitating old buildings is not only more environmentally friendly (90%), but costs less than constructing new buildings with the same amount of space, according to 78% of respondents (Gilderbloom *et al.* 2008). While not always the case, these restoration and adaptive reuse strategies seem to be more affordable than building new units. Consequently, there is more money invested in new construction and builders create the myth that renewal or preservation is too costly.

As Rypkema (2006) has said, "the best green house is an old house." We would add that that best green house is an old house that lies within a functioning historic downtown neighborhood. Rypkema argues that every time a large historic house is demolished, the construction debris put in a landfill is equal to 1 million recycled aluminum cans. Rypkema argues the relationship between historic preservation and sustainability:

> Razing historic buildings results in a triple hit on scarce resources. First, we are throwing away thousands of dollars of embodied energy. Second, we are replacing it with materials vastly more consumptive of energy. What are most historic houses built from? Brick, plaster, concrete, and timber are among the least energy consumptive of materials. What are major components of new buildings? Plastic, steel, vinyl, and aluminum are among the most energy consumptive of materials. Third, recurring embodied energy savings increase dramatically as a building life stretches over fifty years. You're a fool or a fraud if you claim to be an environmentalist and yet you throw away historic buildings, and their components.

As Chiras (2004, p. 16) argues, the best kind of sustainable shelter is maintaining and enhancing historic housing. He states that renovating an historic home is the:

> epitome of conservation and is arguably one of the most sustainable forms of construction … it uses existing resources such as lands, foundations, and walls. No new land must be bulldozed or cleared to make room for a new home: trees do not need to be cut down. Further benefits can be achieved if wastes generated from the project are recycled.

Many older houses can be saved at a cost substantially below market rate. An old house contains a great deal of "embedded" energy, which is wasted when it is demolished. Embedded energy describes the totality of energy used to build and create one house at one particular location, such as the sum result of energy needed to produce a house by cutting down trees in the forest, hauling the wood back on trucks, manufacturing the steel and bricks, and creating the infrastructure of roads, sidewalks, gas, water, and sewer lines. Richard Moe, President of the National Trust for Historic Preservation, offers an example of preserving a historic building:

> Boston City Hall has about 500,000 square feet of space. The amount of energy embodied in that building is about 800 billion BTUs. That's the equivalent of about 6.5 million gallons of oil and if the building were to be demolished, all of that embodied energy would be wasted. What's more, demolishing City Hall would create about 40,000 tons of debris. That's enough to fill more than 250 railroad boxcars a train nearly $2^{1}/_{2}$ miles long, headed for a landfill that's probably almost full already. Finally, constructing a new 500,000-square-foot building on the City Hall site would release about as much carbon into the atmosphere as driving a car 30 million miles or 1,200 times around the world. (Moe 2008)

Preservation equals a commitment to sustainable practices. Government can use an array of bold and innovative steps to enhance historic preservation efforts, such as raising the cap on State Tax Credits, establishing additional historic zoning overlays, providing soft second loans, providing grants for façade restoration, and expanding educational opportunities to historic property owners.

Environmental question and methodology

A related connection between historic preservation and environmental sustainability is whether residence in an historic district neighborhood indeed encourages more environmentally friendly lifestyles. No secondary data are available to test whether the residents of Kentucky's and/or Louisville's historic districts are any more pro-environment in their beliefs, concerns, or behavior. Thus, we are unable to test the desired question regarding the impact of historic district residence on individuals' environmentalism. However, to shed limited empirical light on the effect of historic preservation on environmentalism, we ask a revised question. Do residents of urban (generally historic) neighborhoods closer to downtown exhibit higher degrees of pro-environmental behavior than those living in surrounding suburban neighborhoods? Furthermore, we test if those residing in single-family homes in these historic neighborhoods are more environmentally friendly than their neighbors living in (likely newly built) condominiums or apartments.

We draw data from the biennial Louisville Metro Survey (LMS) collected in spring 2006 by the University of Louisville's Urban Studies Institute in consultation with the Department of Sociology. The adjusted response rate for this survey was rather low (approximately 15%). However, previous research on environmentalism had similarly low response rates, particularly when including urban populations (Morrissey and Manning 2000). Ambrosius (2008) found that the LMS responses compare favorably with 2000 US Census Data and are thus likely fairly representative of Louisville's population.

A total of 807 complete interviews were conducted by telephone using random digit dialing in Jefferson County, Kentucky ('Louisville Metro'). Participants were asked for responses on moral, environmental, and political issues along with basic socio-demographic characteristics. Just over half of cases (429) were asked thirteen environmental questions to limit the length of the survey experience. Principal components analysis (PCA) was performed to extract several components of environmentalism from the thirteen LMS questions on environmental issues (Ambrosius 2008). Using the PCA results, a summative index of pro-environmental behavior was constructed from responses to six questions meant to gauge a variety of conservationist behaviors done for "environmental reasons" (all six loaded on a single component): (1) avoiding products with unnecessary packaging; (2) conserving resources in one's home; (3) purchasing products produced in an environmentally friendly manner; (4) avoiding disposable paper or plastic products; (5) limiting driving; and (6) and recycling appropriate products. Chronbach's alpha (α) is 0.761, which means the index is internally consistent at an acceptable level. Walton (2006) refers to this behavior scale, drawn from the same data set, as "personal pro-environmental behavior" (PPEB).

Two models are specified using ordinary least-squares (OLS) regressions – the first with the entire metropolitan data set composing the sample ($n = 341$ after listwise deletion of cases) and the second with just the "urban" respondents ($n = 97$). The environmental behavior index is the dependent variable for both regressions. The key independent variables are an urban residence dummy (attributed to zip codes which composed the old city of Louisville), in the first model, and a home residence dummy in the second. Control variables include items present in the literature on environmental behavior – race, education, sex, age, income, and overall political ideology (Samdahl and Robertson 1989, Jones *et al.* 1999, Morrissey and Manning 2000, Nooney *et al.* 2003). The findings of this regression analysis are unique because previous research compares urbanites with rural residents, assuming that suburbanites share the same environmental outlook as central-city residents (Arcury and Christianson 1993, Nooney *et al.* 2003, Ambrosius 2008). We believe a clear difference likely exists between residents of sustainable urban neighborhoods and those living in younger suburban neighborhoods. Since the data set is at the individual level, excessive multicollinearity is not of concern so tolerance scores are not shown in Tables 7 and 8.

Environmental findings

We find that urban residents are indeed more environmentally friendly in their behavior than their suburban counterparts, holding the control variables equal (Table 7). The coefficient on urban residence is positive and significant at the 0.05 level, although the beta size is the smallest of the significant predictors. In the second regression, we find that those urban residents who live in a house are more environmentally friendly than their urban counterparts living in an apartment or condominium (Table 8). The coefficient on the home dummy is positive and significant at the 0.001 level. Interestingly, the effect size is the second greatest – only falling behind race. Type of dwelling has a greater impact on environmental behavior than age, income, or liberal ideology.

This evidence leads us to conclude that those living within a central city are, on average, more pro-environment in their behavior and that those urbanites living in likely historic homes are even more pro-environment than those residing in higher-density, new-build apartment complexes and condos. This confirms our suspicions regarding the effect of historic preservation on environmentally sustainable behaviors and practices. Encouraging the renovation of historic structures not only preserves existing housing stock and conserves

Table 7. Urban residence's impact on environmentally friendly behavior, 2006.

	B	Standard error (SE)	Beta	*t*	*p*
(Constant)	12.839	1.080		11.890	0.000
Black (dummy, 1/0)	–1.620	0.608	–0.153	–2.665	0.008
Education level (eight categories)	–0.004	0.133	–0.002	–0.029	0.977
Male (dummy, 1/0)	–0.256	0.416	–0.032	–0.615	0.539
Age (years)	0.042	0.013	0.176	3.326	0.001
Income estimation (US$, thousands)	–0.020	0.009	–0.134	–2.199	0.029
Liberal scale (five categories)	0.374	0.167	0.120	2.245	0.025
Resides in central city (dummy, 1/0)	1.014	0.489	0.116	2.073	0.039

Note: Dependent variable: environmental behavior summative index; $n = 341$; adjusted $R^2 = 0.077$; 28% reside in the central city.
Source: 2006 Louisville Metro Survey.

Table 8. Single-family home's impact on environmentally friendly behavior for those residing in the central city, 2006.

	B	Standard error (SE)	Beta	*t*	*p*
(Constant)	12.731	1.630		7.808	0.000
Black (dummy, 1/0)	–3.356	0.701	–0.435	–4.788	0.000
Education level (eight categories)	–0.169	0.218	–0.083	–0.772	0.442
Male (dummy, 1/0)	–0.348	0.621	–0.047	–0.560	0.577
Age (years)	0.038	0.019	0.167	1.965	0.053
Income estimation (US$, thousands)	–0.049	0.016	–0.365	–2.992	0.004
Liberal scale (five categories)	0.820	0.244	0.285	3.366	0.001
Single-family home (dummy, 1/0)	3.321	0.778	0.407	4.270	0.000

Note: Dependent variable: environmental behavior summative index; $n = 97$; adjusted $R^2 = 0.342$; 72% residing in the central city live in a single-family home as opposed to a condominium or apartment unit.
Source: 2006 Louisville Metro Survey.

costs, energy, and materials, but also encourages individuals to reside in neighborhoods that naturally foster more environmentally friendly behaviors.

Discussion

A historic property owner feels that their investment is more secure in historic districts because their neighborhoods are not only preserved, but also are well maintained. They recognize that a historic preservation district protects their investment and makes it more profitable. That is why neighborhoods that have enacted historic preservation districts throughout Kentucky overwhelmingly do not repeal them, and in several cases have increased the boundaries of the district. Stephen Roosa, a major owner of historic buildings in Louisville, agrees:

> Real estate can be a super long-term investment, especially in historic neighborhoods. When I first decided to focus my efforts in the Old Louisville and Highlands neighborhoods, most real estate professionals I talked with discouraged me from investing in these neighborhoods. I persisted and now have several properties in my portfolio in these areas. As these neighborhoods

> have improved over the years, these investments have provided much greater returns than if I had invested elsewhere in the county. (Gilderbloom *et al.* 2008, p. 18)

Investors do not want to see the home next door or across the street demolished and replaced with a cinderblock house that looks like it came out of the hills of Costa Rica, or see a 1920s bungalow covered with vinyl siding, original windows replaced, and original wooden doors replaced by a cheap, manufactured door bought from a big box store. Removing these important architectural details and modernizing them with inexpensive materials is devastating to the value of the defaced home, but it also hurts nearby property values.

Conclusion

This paper examines the benefits of historic preservation and how it relates to sustainable development. This argument is made using three major sources of data: (1) first, we looked at the impact of State and Federal Tax Credits on investment in older housing, which allow for reuse; (2) we looked at the impact of historic preservation on property values in all 170 census tracts and neighborhoods in Louisville, Kentucky; and (3) we used survey data in Louisville about how historic space might impact environmental attitudes.

This is a case study of one state and one city in the United States that is committed to historic preservation. Louisville is among 140 cities in the United States with a population of 50,000 or more and is not located within 20 miles of another city with a population of 50,000 or more (Gilderbloom and Appelbaum 1988, Gilderbloom *et al.* 2008). While examining historic preservation and environmentalism, Louisville is more of a representative city than New York or Juneau, Alaska. Louisville is unique in that it leads the nation in good historic preservation practices, which complements sustainable practices.

This paper argues that historic preservation has a positive impact on job creation, property values, and environmental stewardship. We demonstrated empirically via a computer economic stimulation model that historic preservation creates more jobs than most other investments. Our research also supports policy recommendations at the local, state, and federal levels such as higher tax incentives for historic preservation, including facade restoration, and forgivable loans for historic rehabilitation. These types of measures not only will encourage economic development and increased revenues, but also will do so in a way that protects the natural environment. Restoring an older home or building is more labor-intensive than other kinds of public investments. Because of their proximity to downtown, and consumer preferences for housing with reduced energy costs, historic buildings experience higher appreciation in property values than newly constructed homes and buildings. Many of these historic buildings were designed to live in year-round before electricity and air-conditioning. This paper also shows that environmentalism and historic preservation are linked and compliment one another. Residents of historic neighborhoods exhibit more environmentally friendly behavior, particularly those living in single-family homes. Saving one home including its pipes, wires, brick, wood, and metal means one less house built in suburbia. More research needs to be conducted in other countries, states, and cities to see if these results can be replicated.

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Notes on contributors

John I. Gilderbloom PhD is Professor of Urban and Public Affairs at the University of Louisville and Director of the Center for Sustainable Urban Neighborhoods. His recent book, *Invisible City: Poverty, Housing, and New Urbanism*, was released by University of Texas Press in January 2008.

Matthew J. Hanka graduated with a Ph.D. in Urban and Public Affairs at the University of Louisville and is a Senior Research Associate with the Center for Sustainable Urban Neighborhoods. His dissertation focused on the impact of the HOPE VI program on the economic revitalization of Newport, Kentucky.

Joshua D. Ambrosius is a PhD candidate and University Fellow in Urban and Public Affairs at the University of Louisville and Research Associate with the Center for Sustainable Urban Neighborhoods. He holds a Masters of Public Policy from the Johns Hopkins University and is a 2008 recipient of the Southern Growth Policies Board's Southern Research Fellowship.

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