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Residential Property Values and New Jersey Transit Village Program

Robert B. Noland, Stephanie DiPetrillo, and Michael L. Lahr

Since 1999, 23 New Jersey transit villages have been designated in New Jersey municipalities, with the intention of intensifying development around rail stations and bus hubs. As one test of the effectiveness of this state effort, the appreciation in residential property values is investigated and compared with that in other municipalities in the state. Some limited positive evidence is found to support the New Jersey transit village designation. Econometric analysis of the change in average residential sales price over 9 years finds an association but cannot establish a causal effect. Case study analysis of selected New Jersey transit villages suggests that the forethought, commitment, and political will required to apply for transit village status may be what sparks municipal development rather than the designation itself.

Since its inception in 1999, the New Jersey Transit Village Initiative was designed to encourage smart growth near transit stations. That is, it was intended to foster transportation-efficient community redevelopment and revitalization centered on transit facilities (rail stations and bus hubs). It was believed that such an increased transit focus would reduce traffic congestion and lead to more walkable environments around transit stations.

To be considered for designation by the state, a municipality must adopt land use entitlements necessary to advance transit-oriented development (TOD) and demonstrate a commitment to redeveloping the 0.5-mile area around the transit facility into compact, mixed-use neighborhoods with a strong residential component. Specifically, according to the 2009 Statement of Qualification for Transit Village Designation, several measures used to evaluate potential transit villages include the presence and potential for affordable housing, bicycle and pedestrian improvements, place-making efforts (e.g., provision of public amenities such as parks, plazas, and historic resources), a local management organization (e.g., special improvement districts, chamber of commerce, urban enterprise zone, or main street organization), and community events. The New Jersey Transit Village Initiative is a unique smart growth program that supports TOD by providing incentives to municipalities to encourage redevelopment and revitalization near transit facilities. It is the only program that encourages municipalities to comprehensively plan in a holistic manner around a transit station or bus terminal,

rather than with piecemeal efforts around specific developments or rail stations.

Wells and Renne list several apparent success factors for obtaining the designation (1). The factors include strong local leadership, a history of municipal planning with a sustained vision of redevelopment, an entrepreneurial attitude, a willingness to foster pedestrian and bicycle access to the downtown and station areas, support for the commercial area through downtown partnerships, Main street programs or enterprise zones, and a sensitivity to quality-of-life issues (e.g., by including parks, recreation areas, and cultural assets in redevelopment goals). Designated municipalities qualify for priority funding and technical assistance from some state agencies as well as for grants from the New Jersey Department of Transportation. In addition, once designated, a municipality is eligible for a \$100,000 grant to be used for either planning or physical infrastructure improvements. As of 2010, 23 municipalities had been designated as New Jersey transit villages. (Orange was designated in 2009, and Somerville, Montclair, and Linden were designated in 2010, but these municipalities are not included in the analysis.)

Has New Jersey transit village designation encouraged community revitalization and redevelopment, as hoped for? Certainly, increased intensity of development should lead to increased transit ridership because of the proximity to transit. Research instigated by Alonso shows that as land use becomes more intense, property values should rise (2). For this reason, the extent to which property values appreciated in the wake of New Jersey transit village designation is examined here.

CONTEXT OF NEW JERSEY TRANSIT VILLAGES

The rail network in New Jersey is relatively extensive, providing ample opportunity for TOD planning statewide. The network focuses on commuter rail service provided by New Jersey Transit (NJ Transit), which is fed by bus lines and automobiles. NJ Transit operates eight rail lines that focus on delivering commuters to Penn Station in New York City and to Hoboken, New Jersey, which lies directly across the Hudson River from Manhattan Island and has ferry and Port Authority Trans-Hudson (PATH) subway connections to Manhattan. PATH is a heavy rail line that serves Hoboken and Newark, New Jersey, as well as Manhattan. The Hudson-Bergen Light Rail (HBLR) serves a densely populated set of communities in Hudson County (connecting Bayonne, Jersey City, Hoboken, Weehawken, Union City, and North Bergen, New Jersey), the core of which experienced major development, even before the inception of HBLR.

Another focal point of the rail system, Newark lies along NJ Transit's Northeast Corridor, North Jersey Coast, and Raritan Valley lines. In addition to PATH and NJ Transit, the city is served by the

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Newark Light Rail system, a relatively small, intraurban subway system that has expanded to connect the city's two rail stations, Newark Penn Station and Broad Street Station. In southern New Jersey, NJ Transit provides rail service between Philadelphia, Pennsylvania, and Atlantic City, New Jersey; Southeastern Pennsylvania Transportation Authority (SEPTA) provides service from two stations in and near Trenton, New Jersey, to Philadelphia; and Port Authority Transit Corporation (PATCO) provides service from Philadelphia to the suburbs of southern New Jersey. The RiverLine, completed in 2004, connects Trenton and Camden, New Jersey, and was developed partly to spur economic development in older industrial communities along the Delaware River.

The 23 New Jersey transit villages are listed in Table 1, along with several descriptors (year designated, home municipality and county, rail line that runs through, 2008 average rail boardings, and 2008 population estimates). Figure 1 illustrates transit village locations in the context of New Jersey's rail network. All but the Pleasantville Transit Village, which is located near Atlantic City, contain rail stations; Pleasantville is focused strictly on a bus terminal. The degree of patronage varies widely at the various transit village stations, as does their distribution throughout the state.

Six New Jersey transit villages were investigated as case studies to document the changes that have occurred since designation and to inform the statistical analysis that follows. Belmar, Burlington City,

Metuchen, and Journal Square in Jersey City, New Jersey, represent four rail lines and geographies and are discussed in detail later. Because of space limitations, the other two case studies (Bound Brook and Pleasantville) are discussed only briefly in this paper.

THEORETICAL FRAMEWORK

It is well known that access to transportation facilities, particularly rail stations, provides a premium to residential property values. Alonso demonstrated it formally, showing that improved accessibility—as expressed by lower commuting costs to a central business district (CBD)—should motivate increases in property values for any given location within commuting distance of that CBD (2). Studies that have evaluated property value changes around transit stations have yielded mixed results (3, 4). The consensus is that land prices are enhanced, but the nature of the enhancement differs between commercial and residential properties. Specifically, the values of residential properties very close to rail stations sometimes appear to suffer (5). The mixed results that are found in many studies may be attributable to how the planning for development is implemented around a station. A transit station with large amounts of parking or zoning restrictions on development may not yield the same property price appreciation (3, 5).

TABLE 1 Transit Village Stations

Station ^a	Rail Line	Rail Boardings (FY2008)	Year Designated Transit Village	Population (2008)	County
Bay Street Station	Montclair–Boonton Line	975	2010	36,839	Essex
Belmar	North Jersey Coast Line	402	2003	5,901	Monmouth
Bloomfield	Montclair–Boonton Line	998	2003	43,682	Essex
Bound Brook	Raritan Valley Line	726	2003	10,319	Somerset
Burlington City	RiverLine	543	2007	9,415	Burlington
Collingswood	PATCO	1,743	2003	13,853	Camden
Cranford	Raritan Valley Line	1,172	2003	21,851	Union
Elizabeth	Northeast Corridor	4,273	2007	124,401	Union
Journal Square	PATH	26,869	2005	239,658	Hudson
Linden	Northeast Corridor	2,333	2010	39,054	Union
Matawan	North Jersey Coast Line	3,306	2003	8,748	Monmouth
Metuchen	Northeast Corridor	4,001	2003	13,047	Middlesex
Morristown	Morristown Line	2,218	1999	18,847	Morris
Netcong	Morristown Line	237	2005	3,221	Morris
New Brunswick	Northeast Corridor	6,129	2005	50,904	Middlesex
Orange	Morristown Line	1,160	2009	30,909	Essex
Pleasantville	na ^b	na	1999	18,851	Atlantic
Rahway	Northeast Corridor	3,244	2002	28,501	Union
Riverside	RiverLine	402	2001	7,710	Burlington
Rutherford	Bergen County Line	1,026	1999	17,410	Bergen
Somerville	Raritan Valley Line	748	2010	12,584	Somerset
South Amboy	North Jersey Coast Line	1,313	1999	7,742	Middlesex
South Orange	Morristown Line	3,450	1999	15,865	Essex

NOTE: na = not applicable.

^aAll stations are located in municipalities of the same name, except for Journal Square Station located in Jersey City, and Bay Street Station, located in Montclair.

^bBus terminal only.

SOURCE: NJ Transit for rail boardings, New Jersey Department of Labor and Workforce Development for population.



FIGURE 1 Locations of New Jersey transit villages.

Another important feature of transit villages (and TODs) is that various amenities unrelated to accessibility (e.g., sidewalk enhancements, public plazas, and architectural features) often are part of the overall plan. These amenities also can enhance property values (6). Hedonic analysis has been applied to isolate some of these features (7, 8). Many municipalities designated as New Jersey transit villages have a mix of features that enhance walkability, at least near the transit station. Although data are not available at this level of detail, the analysis conducted here captures accessibility and amenity features as well as a likely indicator of an active community planning process (as expressed through the New Jersey transit village designation).

Two recent studies examine property appreciation along two new light rail systems in New Jersey, RiverLine and HBLR (9, 10). Both studies use repeat sales data, enabling the analysis of changes before and after opening of the lines. Pertinent to this study is that the RiverLine seems to have had a neutral effect at best on housing price appreciation, except some subsamples (e.g., in low-income areas, which saw an increase). The HBLR study found price appreciation as far as 0.5 mile from its most remote stations, which was offset by a slight nuisance effect for those properties immediately next to the line. The context and economic opportunities of each line are quite different. The RiverLine runs through declining industrial towns along the Delaware River, whereas a good portion of the HBLR runs along New Jersey's densely populated and rapidly developing so-called Gold Coast, directly across the Hudson River from Manhattan; however, much of the Gold Coast itself is omitted from this analysis because of its proximity to alternatives that transport commuters directly to Manhattan. Two New Jersey transit villages are in municipalities along the RiverLine, and none are at an HBLR station; however, a Jersey City PATH station not too far from the HBLR is the focus of one.

CASE STUDIES

Case studies were conducted of six transit village municipalities, with the intent of informing the statistical analysis discussed later. Four case studies are elaborated in detail; the other two (Bound Brook and Pleasantville) were distinct locations, and a brief description of each is provided before the more in-depth descriptions of the case studies for Belmar, Burlington City, Metuchen, and Jersey City's Journal Square.

Bound Brook is a mixed-income community with low-income immigrant neighborhoods near the rail station and middle-income areas farther away. The downtown area near the station has been plagued by floods from the confluence of the Millstone and Raritan rivers (most recently, in August 2011). Even though various sidewalk and road enhancements have been built near the rail station, development in Bound Brook has been stalled pending a solution to the flooding from the U.S. Army Corps of Engineers. Because of this rather unique barrier to further development, a detailed case study does not provide additional insights.

Pleasantville is a low-income minority community located outside of Atlantic City. The transit village is focused on a bus terminal (no rail service). A site visit revealed that many Pleasantville storefronts are vacant, and development has not thrived. Selected as a transit village partly to locate a transit village in southern New Jersey, Pleasantville likely exhibits distressed economic activity as a result of the general economic downturn. Because of the unique character of this case study, Pleasantville does not add much to the overall analysis.

Belmar Borough

Located on NJ Transit's North Jersey Coast Line, the shore community of Belmar Borough is home to about 6,000 full-time residents. Twenty northbound trains depart Belmar daily. Travel from Belmar Station to New York Penn Station takes about 2 hours and requires a change of trains at Long Branch or Newark Penn Station. Currently, only diesel locomotives serve the North Jersey Coast Line south of Long Branch Station. A planned change to dual-fuel engines is expected to shorten travel times.

According to local officials, Belmar Borough wishes to transform itself into "a sustainable year-round community" by fostering development and redevelopment near its train station and waterfront. Discussions concerning redevelopment in Belmar Borough began as early as 1991 and focused on an area located in the northwestern part. This area was later designated as the Seaport Redevelopment Area and includes seven blocks directly north of the station. In 1997, the Belmar Planning Board designated the Seaport Redevelopment Study Area "an area in need of redevelopment" in conformance with the Local Housing and Redevelopment law. The Seaport Redevelopment Plan was adopted in August 2003. In fall 2003, Belmar was designated a New Jersey transit village.

On-site observations (June 2010) suggest that the area surrounding the Belmar Station is in transition. The area is dominated by surface parking and several unoccupied parcels. However, a newly completed project—a three-story mixed-use residential-over-retail building—is an indication of what the future might hold (Figure 2). This building is a good example of the type of structure that would be suitable for a suburban TOD location.

Directly east of the station and rail right-of-way is a large shopping center comprising several one-story buildings and copious surface parking. The buildings are oriented toward the parking, not the street, creating a less-than-ideal pedestrian environment. A large pedestrian plaza is located between the shopping and Main Street. Although a potential amenity, the plaza is neither well connected to the station nor particularly friendly to visitors who might wish to linger and enjoy the local scene (because it lacks street furniture and the like).

Graphical analysis suggests that residential property values for Belmar Borough increased relative to the comparison region (central New Jersey) starting in about 2001–02, just before the New Jersey transit village designation (Figure 3a). After the designation, the divergence in growth rates persisted. Still, it is difficult to link the rise in home prices to the designation. Instead, the borough's emphasis on solid planning practice may have been the key factor leading to positive local development.

Burlington City

In March 2007, Burlington City was designated a transit village and received \$100,000 to help fund a redevelopment plan for the area around its NJ Transit RiverLine Burlington Towne Centre Station. The RiverLine connects Burlington City to the north with Trenton (20 minutes), where riders can access the Northeast Corridor Line traveling to New York, SEPTA, and Amtrak (National Railroad Passenger Corporation). The RiverLine also connects Burlington City to the south with Camden (30 minutes), where riders can reach Philadelphia via PATCO. Burlington Towne Centre Station is one of two stations in the municipality; the other is the Burlington South Station, located about 0.6 mi to the south.



(a)



(b)



(c)



(d)

FIGURE 2 New Jersey TOD: (a) Belmar mixed-use residential-over-retail building, (b) Burlington City historical buildings, (c) Journal Square plaza by station (Jersey City), and (d) Metuchen sidewalk bench.

With more than 400 years of settlement history, Burlington City is one of New Jersey's most historic urban areas. Its main thoroughfare contains more than 40 structures designated as historic by the state or national government. The community is walkable, with wide sidewalks and short blocks, vestiges of its past. Recent improvements to pedestrian infrastructure (e.g., rebricking and repointing the sidewalks) help to reinforce the community's historic nature.

The RiverLine fostered what a former mayor termed a renaissance: six downtown businesses opened during the first year of the line's operation. Burlington City's current transit village redevelopment plans call for 120 homes to be built, including at least 29 affordable units. A new master plan is currently being developed with aid from the Delaware Valley Regional Planning Commission that includes a community visioning process, a land use and circulation plan, and design guidelines to ensure that the transit-friendly downtown revitalization seeks community input. Burlington City is actively planning the redevelopment of several properties. Whereas the previous mayor championed the New Jersey transit village program, a change in administration and personnel shortly after transit village designa-

tion led to political and financial support for the effort being redirected to other ventures.

Average property values in Burlington City are lower than average for southern New Jersey, and the area's recent property value trend also has been below the regional average (Figure 3b). The New Jersey transit village designation does not yet appear to have had a detectable effect on property values; however, given that the designation was in 2007, it may be too soon to assess any impact. The RiverLine was built in 2004, partly as a revitalization strategy for communities along the Delaware River, and no discernible impact on property values in Burlington City has been noted from the completion of the RiverLine.

Journal Square (Jersey City)

Journal Square is the most urban and most populated of the New Jersey transit villages. Whereas considerable redevelopment has occurred elsewhere in Jersey City, particularly along the waterfront and near some HBLR stations, little redevelopment has taken place



FIGURE 3 Index of average residential sales value trends relative to regional average trends for (a) Belmar, (b) Burlington City, (c) Jersey City, and (d) Metuchen.

at Journal Square. Dating from the 1970s, the Journal Square Transportation Center comprises a 10-story office tower, a grade-separated pedestrian plaza, and a parking deck. The area surrounding the station is currently dominated by several surface-level parking lots, congested traffic, and marginal businesses. Pedestrians accessing the station currently are at a disadvantage, having to cross overly wide roadways such as nine lanes of traffic on JFK Boulevard. Despite Journal Square's shortcomings, the seeds of a truly livable, transit-supportive community are in place.

In October 2008, the mayor announced an ambitious plan to transform Journal Square into a pedestrian-friendly commercial and residential urban center. The so-called Vision Journal Square intended to remake the 244-acre site by adding more than 10,000 new housing units, millions of square feet of commercial space, 9 acres of parks and open plazas, and a 2-mile greenway connecting the renovated Journal Square Station with the city's redeveloped waterfront to create the longest continuous urban walkway in the nation. To date, plans are on hold, primarily because of disagreements over how to proceed and the current economic climate.

For several years before this ambitious plan for Journal Square, Jersey City was the site of considerable residential and nonresidential redevelopment. However, it occurred near the waterfront, not in the Journal Square area. According to city officials, 130 new housing units were constructed in the Journal Square Transit Village district between January 2005 and December 2007. The one significant non-residential project in the transit village in 2005 was the renovation of 35 Journal Square, formerly known as the Trust Building. This work entailed rehabilitating ground floor retail and 11 floors of office space

in a 196,000-square-foot building. In addition, ground was broken on the Journal Square City Center Towers in spring 2009. Planned as a pair of mixed-use residential skyscrapers—the 68-story North Tower and the 50-story South Tower—containing a total of 1,600 rental units as well as several stories of retail and parking, this project has made little progress due to current economic conditions.

Because property valuations are based on all of Jersey City, conclusions cannot be drawn for the trends around Journal Square. For Jersey City, a divergence is apparent from the northern New Jersey average growth (starting in about 2004; Figure 3c). Residential property values are higher than the northern New Jersey average, most likely due to the high-end waterfront developments opposite Manhattan.

Metuchen Borough

In 2003, Metuchen was designated as the eighth New Jersey transit village. Metuchen's NJ Transit station is located on the Northeast Corridor Line and provides easy northward access to Newark and New York City and southward access to New Brunswick, Princeton, and Trenton, New Jersey. Metuchen has actively pursued smart growth and transit-friendly development policies since the 1980s in an effort to promote a dense and vibrant town center, including businesses marketed to commuters (e.g., restaurants, dry cleaners, and other services).

Metuchen has made efforts to enhance its central core, which includes the area near the station. The borough has a lively central

downtown district located on about 0.25 mi along Main Street, primarily between the rail station and Middlesex Avenue. Composed of mostly first-floor businesses with office and residential uses above that create a continuous street wall and an attractive shopping area, this district exists despite the significant presence of automobile-oriented shopping nearby.

The borough has helped to foster the redevelopment and infill of more than 100 acres of land into mixed-use, commercial, and civic space. The borough has created more than 500 affordable and market-rate residential units within a 10-minute walk of the station, including one development with 105 residences. Another new development will include four mixed-use retail and residential buildings providing at least 121 new residences and a new 15,600-square-foot grocery store.

The borough also has sought to enhance its pedestrian amenities. A major campaign focusing on calming traffic and pedestrian-friendly streets culminated in Walk Metuchen, a program funded by the Robert Wood Johnson Foundation that mapped a system of walking paths to promote a healthy lifestyle. The paths connect outlying parts of the community with its downtown and the station.

Residential property values in Metuchen are slightly below the average for central New Jersey (Figure 3*d*). The local growth trend of residential property prices also is somewhat below that of the broader region, which is surprising because Metuchen has some very attractive TOD features.

Findings and Lessons Learned

The case studies indicate that for these four municipalities, there are a variety of development activities that are being planned or are occurring beyond those funded by transit village funds. Other transit villages do not necessarily have this level of activity (e.g., Pleasantville and Bound Brook). Thus, one lesson appears to be that the level of development activity may not be strictly linked to whether the state has designated a community as a transit village. In fact, active planning initiatives and committed leadership probably are required to obtain the transit village designation, although political considerations have played a role in some cases. Likewise, this leadership is subject to change and, as in the case of Burlington City, may result in a corresponding change in commitment to leveraging the value of having a transit station.

CROSS-SECTIONAL ANALYSIS

The case studies provide a basis for understanding the results of a cross-sectional analysis of municipalities. Data were gathered on residential property values and other factors generally known to influence property values in order to conduct a hedonic regression analysis. The key variable of interest was a control for whether a municipality was designated as a New Jersey transit village.

Models are estimated on the basis of municipal-level averages in an attempt to control for other policies that affect municipal-level property values. Most hedonic models use individual property data. However, the objective here is to examine overall effects associated with the transit village instead of the details of how distant a property is from transit; thus, this approach is more appropriate. Much of the readily available data is also recorded at the municipality level, making this level a convenient unit for analysis. Housing values often are lower when very close or adjacent to a rail station because of vari-

ous negative externalities (such as increased traffic and noise, and possibly perceptions of crime); however, values increase within a short walking distance (5). Thus, the municipal level should average out these very localized effects and give a better indication of whether the New Jersey transit village designation has any effect on overall municipal housing values. In an analysis of Philadelphia suburban house values, one study found little difference between aggregate census tract and microdata estimations, which lends additional support to a municipality-based analysis (11).

A cross-sectional model of the change in property values between 2000 and 2008 is estimated on the basis of average equalized assessment values. This allows determination of whether property price changes between 2000 and 2008 have been stronger in New Jersey transit villages (as identified in 2008) than elsewhere in the state, *ceteris paribus*. Average residential sales data are also available but provide only a sample of housing values based on properties that sold in a given year; sales data also include non-arm's-length transactions, which may cause additional problems. The upshot is that assessed values provide a more reliable measure of value.

The key variable of interest is whether a transit village has been designated in the municipality. Additional details are needed on each municipality's typical property characteristics: the quality and quantity of its residential structure(s) and nature of its lot sizes (q), the demographic composition of its neighborhoods (n), its access to major job and retail marketplaces (m), the quantity and quality of the public services it provides (s), the typical residence's share of the tax burden to pay for those services (t), and the magnitude of demand pressures on the municipality's residential market during the study period relative to those engaged elsewhere in the state (d). The basic model applied is

$$[\ln(P_{i2}) - \ln(P_{i1})] = \beta_1 \ln(P_{i1}) + \beta_2 q_i + \beta_3 n_i + \beta_4 m_i + \beta_5 s_i + \beta_6 t_i + \beta_7 d_i + \epsilon_i$$

where

- P = property valuation,
- i = municipality,
- β = parameter estimate, and
- ϵ = error term.

This approach of using the change in property values has been applied elsewhere (10, 12–14).

Data

Relevant data were collected at the municipality level. Data sources and additional notes on the data derivation are provided in Table 2.

The dependent variable is change in residential property valuation. The precise measure used for it is the equalized assessment value, which is an average of the preceding 3 years of the total aggregate equalized valuation by municipality. It also includes the assessed valuation of Class II railroad property. The objective of equalizing value is to adjust for any differences in assessment measures used by different municipalities. The total value, available by municipality, is divided by the total number of housing units in the municipality (obtained from the New Jersey Department of Labor and Workforce Development). The equalized values are indexed with the housing component of the area's consumer price index. The regional index for the New York metropolitan area is used for the

TABLE 2 Sources of Municipal-Level Data Used in Hedonic Models

Variable in Model	Mean or Percentage (for dummy variables)	SD	Source of Data	Notes
Change in log of average equalized assessed property value (2000–2008)	0.443	0.183	New Jersey Department of the Treasury and New Jersey Department of Labor and Workforce Development	Indexed by using housing CPI for New York City and Philadelphia from Bureau of Labor Statistics
log of average equalized assessed property value in 2000	11.325	0.681		
2008 Transit Village	3.357%	—	New Jersey Department of Transportation	
Housing attributes				
% of 2000 housing stock seasonal	4.675	14.798	2000 U.S. Census	
Rooms per unit in 2000	6.183	1.017	2000 U.S. Census	
% of homes in 2000 built before 1960	49.055	21.122	2000 U.S. Census	
Average residential parcel size in 2000	0.314	0.539	New Jersey Department of Environmental Protection	Derived by the Rutgers Center for Remote Sensing and Spatial Analysis
Neighborhood attributes				
Poverty rate in 1999	5.837	4.726	2000 U.S. Census	
% of 2000 population school aged	25.278	4.454	2000 U.S. Census	
% of population Black in 2000	0.072	0.125	2000 U.S. Census	
% of population Asian in 2000	0.039	0.051	2000 U.S. Census	
% of population Hispanic–Latino in 2000	0.073	0.104	2000 U.S. Census	
Historic preservation ordinance	4.965%	—	15	
Presence of a historic district	11.879%	—	15	
Certified Local Government Program	7.447%	—	15	http://www.nj.gov/dep/hpo/3preserve/clgmap_200901.pdf
Population density squared	3.500 E+07	2.280 E+08	New Jersey Department of Labor and Workforce Development	Land area was obtained from the U.S. Census
Market variables				
log of distance to closest CBD	3.190	0.630	Derived from GIS	
log of sum of squared distances to both New York and Philadelphia	4.378	0.202	Derived from GIS	Deviation off the Northeast corridor derived from: [(Distance to New York City) ² + (Distance to Philadelphia) ²] ^{1/2}
log of distance to New York	3.633	0.741	Derived from GIS	
Presence of PATH station	0.707%	—	Derived from GIS	Location data from PATH
Presence of PATCO station	1.237%	—	Derived from GIS	Location data from PATCO
Presence of NJ Transit commuter rail station	20.318%	—	Derived from GIS	Location data from NJ Transit
Public services				
Verbal SAT score in 2001	499.792	41.954	New Jersey Department of Education	
% of students proficient in ASK4 math test in 2000	53.076	9.309	New Jersey Department of Education	
Tax burden				
Tax rate in 2000	3.388	5.003	New Jersey Department of the Treasury	
% of revenues from state in 1990	1.887	4.030	Municipal Government Financial Statistical Summary, New Jersey Department of Community Affairs, Division of Local Government Services	Calculations from various years
Demand measures				
Land area	13.108	18.175	New Jersey Department of Environmental Protection	
% of land area undeveloped in 2000	45.239	28.262	New Jersey Department of Environmental Protection	Derived by the Rutgers Center for Remote Sensing and Spatial Analysis
Density of residential units in 2000	1,350.993	2,078.393	2000 U.S. Census	
log of housing density in 2000	6.339	1.531	2000 U.S. Census	

NOTE: SD = standard deviation; ASK4 = New Jersey Assessment of Skills and Knowledge; CPI = consumer price index; GIS = geographic information system; — = not applicable.

northern New Jersey counties within the North Jersey Transportation Planning Authority region, and the regional index for the Philadelphia metropolitan region is used for the southern New Jersey region (the remaining counties).

The key independent variable of interest is whether the municipality is a designated New Jersey transit village. These data (including year of designation) were obtained from the New Jersey Department of Transportation.

Two educational variables were collected: SAT scores and the New Jersey Assessment of Skills and Knowledge percent proficiency levels. These scores were averaged for all schools within a school district and associated with the appropriate municipalities. To gauge school quality within a municipality, school districts were mapped and assigned to the appropriate jurisdiction. When residents of municipalities sent students to schools located outside their borders (to a regional school or through send–receive relationships) these municipalities were associated with the appropriate district. (SAT scores and New Jersey Assessment of Skills and Knowledge proficiency levels are compiled by the New Jersey Department of Education, which also maintains a list of sending–receiving agreements. Regional school service areas were determined by staff.)

Population estimates for municipalities were obtained from the New Jersey Department of Labor and Workforce Development. Land area was obtained from the U.S. Census. Population density was calculated for each municipality.

Tax rate information is derived from the equalized tax rate, which equalizes the relative assessment across municipalities. The state creates a statistically designed measure based on sales data to develop state equalization ratios, which are multiplied by general tax rates to calculate equalized tax rates. Data were obtained from the New Jersey Department of the Treasury.

Derived variables include geographical measures, such as the distances from the municipality centroid to New York City and to Philadelphia. From this value, a variable is calculated to proxy for distance from the Northeast Corridor (largely following the rail line between Philadelphia and New York City): $[(\text{distance to NYC})^2 + (\text{distance to Philadelphia})^2]^{1/2}$. Transit station locations were geocoded to identify municipality locations.

Land use and land cover data are a composite of a land use and land cover analysis developed by the New Jersey Department of Environmental Protection for 1995 through 1997, updated for 2000 with image information developed at the Rutgers University Center for Remote Sensing and Spatial Analysis. From these data, the undeveloped land variable—less acreage acquired as open space—is derived as a percentage of total acreage in the year 2000 for each municipality. Average residential lot size (in acres) in 2000 also was derived from these data for each municipality.

Municipalities with historic preservation ordinances were identified from data compiled for another study (15). Those municipalities that are part of the Certified Local Government (CLG) Program were identified. CLGs are eligible to receive grant funding for historic preservation from the U.S. National Park Service.

Various data were compiled from the 2000 U.S. Census: median number of rooms per housing unit for each municipality in 2000; percentage of total housing units that were built before 1960 for each municipality in 2000; percentage of total housing units that are seasonal units for each municipality in 2000; percentage of the total population that is between the ages of 3 and 18 years for each municipality in 2000; percentage of minority populations for each municipality in 2000; and poverty rate in 1999.

Analysis Results

The cross-sectional residential price change was modeled as the change in value between 2000 and 2008. One could hypothesize that the transit village variable is endogenous—that is, only the municipalities that are successful at development successfully apply for transit village status. An instrumental variable model was explored to examine this hypothesis, but all instruments tested were weak. Thus, the focus is on an associative analysis, and conclusions cannot be drawn about a causal effect. The case studies suggest that not all New Jersey transit villages had engaged in successful planning and development activity before designation, so this approach to the analysis is not unreasonable.

According to the results of the ordinary least squares model (Table 3), municipalities designated as New Jersey transit villages after 2000 are associated with increases in assessed values between 2000 and 2008. The coefficient value is statistically significant but relatively small, potentially for two reasons. One is that the area directly affected by proximity to the bus, the train station, or both may be small, for example, within 0.25 to 0.5 mile of the station(s); such size weakens the overall effect at the municipal level, at which measurements are made in the model. The other may be that, while statistically significant, the property value impacts of transit village status simply are not very important in the overall scheme of things. This outcome certainly appears to be the case, given that not all transit villages in New Jersey seem to have used the benefits of their specialized status to the best advantage (as discussed in the case studies).

Most of the results on the control variables meet theoretical expectations. With regard to housing attributes (q), a greater share of seasonal housing units tend to improve appreciation rates in New Jersey and more rooms per unit, larger shares of older housing stock, and larger-than-average parcel sizes tend to dampen the ability of residential properties to appreciate during the study period in New Jersey. The value-dampening effect of larger parcel sizes could imply a growing preference for smaller parcels over larger ones.

For neighborhood attributes (n), the municipality poverty rate and share of population that is of school age had positive effects. But a high share of population with minority status, the presence of a historic district or a historic preservation ordinance, and population density (squared) have deleterious effects on appreciation rates. Whereas a positive effect of low poverty rates might be somewhat unexpected, it undoubtedly displays a convergence effect; that is, the parameter for poverty rates—rather than that for low property values—shows that lower-value properties tend to appreciate more rapidly percentage-wise than do higher-value properties.

The dampening effect of a national historic district is unexpected given findings from many studies of residences outside of New Jersey that use property-level data. Perversely, it could be that those areas that are in need of economic development find a way to become a national historic district as a means to enhance value or at least development. In contrast, a positive association is found for those areas that have become members of the CLG program, which enables the areas to receive planning grants from the U.S. National Park Service for historic preservation. This effect appears to be driven by correlation with the historic district dummy variable (about 0.77), because removing the latter renders the CLG dummy insignificant. When the CLG variable is removed, the historic district dummy remains negative but with a lower significance level. Neither vari-

TABLE 3 Log-Linear Regression of Determinants of Change in Housing Values

Variables in Model	Coefficient	t-Test
Constant	0.12000	0.44
2008 transit village	0.07038	2.29
log of average equalized assessed property value in 2000	0.02546	1.81
Housing attributes		
% of 2000 housing stock seasonal	0.00484	9.88
Rooms per unit in 2000	−0.00965	−1.11
% of homes in 2000 built before 1960	−0.00126	−3.46
Average residential parcel size in 2000	−0.03081	−1.96
Neighborhood attributes		
Poverty rate in 1999	0.00466	2.85
% of 2000 population of school age	0.00670	4.15
% of population Black in 2000	−0.08566	−1.38
% of population Asian in 2000	−0.32112	−2.47
% of population Hispanic–Latino in 2000	0.04836	0.58
Presence of historic district	−0.07000	−2.47
Historic preservation ordinance	−0.04040	−1.27
Certified Local Government Program	0.07000	2.18
Population density squared	−9.53 E−11	−2.06
Market variables		
log of distance to closest CBD	0.05064	4.18
log of distance to New York	0.00785	0.58
log of sum of squared distances to both New York and Philadelphia	−0.03906	−1.24
Presence of PATH station	0.20470	3.00
Presence of PATCO station	0.02339	0.43
Presence of NJ Transit commuter rail station	−0.01340	−0.9
Public services		
Verbal SAT score in 2001	−0.00094	−4.77
% of students proficient in ASK4 math test in 2000	0.00105	1.48
Tax burden		
Tax rate in 2000	0.00459	1.71
% of revenues from state in 1990	−0.00627	−3.77
Demand measures		
Land area	0.00140	3.19
% of land area undeveloped in 2000	0.00080	1.55
Density of residential units in 2000	2.11 E−05	2.96
log of housing density in 2000	0.04238	3.48
Adjusted R^2	.491	—
N	524	—

NOTE: Dependent variable = indexed average equalized property value; — = not applicable.

able shows any interaction with the transit village dummy when removed from the model in turn. The transit village coefficient is robust with respect to these independent binary variables for these two aspects of historic designation by municipality. The full model is shown in Table 3.

The market variables (m) are more in agreement with expectations. Homes farther from the closest CBD (mostly old urban cores) tend to appreciate more. Being away from the main New York–Philadelphia corridor also is associated with lower appreciation rates. Still, homes closer to New York City do not appreciate as quickly as those farther from it. Finally, municipalities with a PATH station tend to have higher-than-expected appreciation rates, even after Jersey City is omitted from the analysis. The appreciation rates of those municipalities with a PATCO or NJ Transit commuter rail station are not superior to those without after controlling for all other cross-sectional variables.

Public services (s) were strictly measured in the form of education—SAT verbal scores and math proficiency in the fourth grade (on the ASK4 math test). Fourth grade math proficiency had no sta-

tistically significant bearing on appreciation rates. However, area municipalities with students who attained higher-than-average SAT verbal scores tend to have properties that do not appreciate very rapidly. As with poverty rates, this latter effect also may be one of convergence because SAT scores are perhaps the single-best-known measure of school quality as perceived by homeowners, and SAT scores are fairly stable over time. Hence, places with higher-than-average SAT scores tend to have higher property values to begin with.

Tax burden (t) results met expectations. In municipalities with relatively high tax rates, home values tend to rise slowly; municipalities that secured large shares of funding from the state—those that tend to have relatively poor tax bases—tend to grow more slowly.

Finally, demand-based pressures (d) have a small positive effect. Land area of the municipality has a positive appreciation effect, and share of undeveloped land in the municipality has a positive effect (albeit not statistically significant). The density of residential units leads to increased appreciation, likely representing increased demand in some municipalities.

In sum, the cross-sectional analysis reveals some evidence of a positive association between New Jersey transit village designation and increases in residential property values after controlling for many other factors that affect residential property values. Still, this finding is not robust to the use of more sophisticated statistical approaches that can control for causality. The overall implication is that whereas residential properties in New Jersey transit villages may have appreciated more than they did elsewhere in the state, the increases may have been due to unmeasured characteristics of the transit village municipalities before the actual designation. That is, the forward-looking perspectives of the policy-makers who enabled the transit village designations may well have been the root cause of any home price appreciation that might have been observed, rather than the privilege and reward of the designation itself. Evidence from the case studies supports this interpretation.

DISCUSSION AND CONCLUSIONS

This analysis of residential property values provides some evidence of an association between New Jersey transit village designation and increased property values. Although the original intent was to develop a causal model with an instrumental variable, it was not possible to find a suitable instrument to represent the designation. The New Jersey transit village designation might not be endogenous; that is, it might be exogenous to the change in value of residential property. Evidence compiled for the case studies suggests that, at times, political factors—rather than any other preceding conditions (e.g., enhanced planning)—may result in transit village designation. Statistically significant associations were found in a cross-sectional analysis.

The case studies show wide variation in what the transit villages have accomplished in terms of development. Some evidence indicates that the municipalities that have taken steps to encourage TOD, through proactive planning or professional capabilities, have seen increases in residential property values. New Jersey transit village designation may simply be an indicator of how a municipality has been able to take advantage of opportunities provided by the state.

The New Jersey transit villages in the data represent many different characteristics. One is accessibility, but these areas also embody TOD amenity characteristics or at least plans to improve amenities. Thus, to a large extent, the statistical analysis captures difficult-to-measure factors in both the variety of what municipalities have accomplished and what the planning capacity within each municipality may be. Thus, even though the statistical analysis has many caveats, the fact that an association between New Jersey transit village designations and increased property values is found suggests that these difficult-to-measure factors may have a positive influence in these municipalities to some extent.

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REFERENCES

1. Wells, J., and J. Renne. *Transit Villages in New Jersey: Success Factors, Obstacles, and Recommendations*. Voorhees Transportation Policy Institute, New Brunswick, N.J., 2003.
2. Alonso, W. *Location and Land Use*. Harvard University Press, Cambridge, Mass., 1964.
3. Vessali, K. Land Use Impacts of Transit: A Review of the Empirical Literature. *Berkeley Planning Journal*, Vol. 11, 1996, pp. 71–105.
4. Debrezion, G., E. Pels, and P. Rietveld. The Impact of Railway Stations on Residential and Commercial Property Value: A Meta-Analysis. *Journal of Real Estate Finance and Economics*, Vol. 35, No. 2, 2007, pp. 161–180.
5. Bowes, D. R., and K. R. Ihlanfeldt. Identifying the Impacts of Rail Transit Stations on Residential Property Values. *Journal of Urban Economics*, Vol. 50, No. 1, 2001, pp. 1–25.
6. Bartholomew, K., and R. Ewing. Hedonic Price Effects of Pedestrian- and Transit-Designed Development. *Journal of Planning Literature*, 2011, Vol. 26, No. 1, pp. 18–34.
7. Song, Y., and G. J. Knaap. New Urbanism and Housing Values: A Disaggregate Assessment. *Journal of Urban Economics*, Vol. 54, No. 2, 2003, pp. 218–238.
8. Plaut, P. O., and M. G. Boarnet. New Urbanism and the Value of Neighborhood Design. *Journal of Architectural and Planning Research*, Vol. 20, No. 3, 2003, pp. 254–265.
9. Kim, K., and M. L. Lahr. The Impact of Hudson–Bergen Light Rail on Residential Property Appreciation. Presented at 90th Annual Meeting of the Transportation Research Board, Washington, D.C., 2011.
10. Chatman, D. G., N. G. Tulach, and K. Kim. Evaluating the Economic Impacts of Light Rail by Measuring Home Appreciation: A First Look at New Jersey's River Line. *Urban Studies*, Vol. 49, No. 3, 2012, pp. 467–487.
11. Voith, R. Changing Capitalization of CBD-Oriented Transportation Systems. *Journal of Urban Economics*, Vol. 33, 1993, pp. 361–376.
12. McDonald, J. F., and C. I. Osuji. The Effect of Anticipated Transportation Improvement on Residential Land Values. *Regional Science and Urban Economics*, Vol. 25, No. 3, 1995, pp. 261–278.
13. McMillen, D. P., and J. McDonald. Reaction of House Prices to a New Rapid Transit Line: Chicago's Midway Line, 1983–1999. *Real Estate Economics*, Vol. 32, No. 3, 2004, pp. 463–486.
14. Goetzmann, W. N., and M. Spiegel. Non-Temporal Components of Residential Real Estate Appreciation. *Review of Economics and Statistics*, Vol. 77, No. 1, 1995, pp. 199–206.
15. Montgomery, S., and M. L. Lahr. Historic Preservation, Property Values, and Tax Rates: A Municipal-Level Analysis in New Jersey. Presented at 48th Annual Meeting of the Southern Regional Science Association, San Antonio, Tex., 2009.

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