Alan M. Voorhees Transportation Center

An evaluation of property values in New Jersey Transit Villages

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Executive Summary

This report provides an analysis of whether the New Jersey Transit Village Initiative has led to increases in property values in municipalities that have joined the program. Our results suggest that for residential property values there is likely an association between higher property values and being designated a Transit Village; however, we cannot show that this is a cause and effect relationship. That is, we are unable to ascertain whether the Transit Village designation itself eventually leads to higher residential property values, as opposed to other factors. We also analyzed commercial rental rates, for industrial, office, and retail uses. Our dataset for this component of the study was insufficient to draw confident conclusions from our analysis. In general, there appear to be no effects, the exception perhaps being a negative association with office rental rates, but our confidence in this result is low.

To supplement our statistical analysis, we also examined trends in residential property values and commercial rental rates graphically. This analysis provides additional evidence of a positive divergence in residential property values from the regional average in which the municipality is located (North, South, and Central). It also provides evidence that not all Transit Villages saw a difference from the background trend, and that the timing of any divergence was not necessarily linked to when the municipality received the Transit Village designation, suggesting that other factors are at play in how property valuations change. We also graphically examined trends in commercial rental rates; these tended to show less of a direct effect associated with the Transit Village designation and also demonstrated that the data was relatively noisy (something that is reflected by the poor results of the statistical analysis).

We also conducted site visits to six Transit Villages. These were Belmar, Bound Brook, Burlington City, Journal Square (Jersey City), Metuchen, and Pleasantville. This provided some insights into the actual changes that have occurred around the station area and any development activities or design changes that may have been made to date. There was substantial variation in the progress that each Transit Village has made, ranging from very little in Bound Brook and Burlington City, to some mixed use development in Metuchen and Belmar. The Journal Square area seems poised and ready for major new developments in what is already an urbanized area, while Pleasantville is a relatively low income area that currently appears somewhat depressed. If anything these results confirm the variability in progress and the apparent variability in particular of commercial rental rates.

Some municipalities tend to be more pro-active in their planning and likely have more professional staff with the savvy to make things happen. Our case studies support this view as some have invested in developing plans, while others have not. We suspect that the ability and commitment to develop around the transit station may be the critical component that can increase property values; being designated a Transit Village happens after this has begun. Our graphical analysis suggests that in those areas with a positive divergence in property values, it begins prior to the Transit Village designation.

Our statistical analyses attempted to control for many other factors known to affect property values. These included crime rates, school quality, population density, housing supply, and tax rates among other variables. One difficulty with our statistical analyses was that our expectations of the effect of some of these variables were not supported by the data. In particular, in our cross-sectional time-series analysis, the data suffered from serial correlation; while we were able to correct for this, we were unable to specify a stable dynamic model with the proper estimation technique. This was a function of the data we had. Our cross-sectional analysis of residential property values, however, was able to show expected effects and provided a good fit to our data.

To summarize, our overall findings on commercial rental rates are weak, while our findings on residential property values suggest an association between Transit Village designation and increases in property values. However, this latter result does not imply that the designation of being a Transit Village causes an increase in residential property values. Rather, other factors likely do this. Our case studies, as well as our graphical analysis, supports the view that those municipalities who are committed to increased development and investment around their transit stations are those more likely to see appreciation in property values.

Introduction

The New Jersey Transit Village initiative has been in existence since 1999 and is designed to encourage "smart growth" development near transit stations. To date, 20 municipalities have been designated as Transit Villages. One indicator of the success of this initiative is to determine whether these communities have actually seen any increase in intensity of development as well as changes that might lead to increased transit ridership due to proximity to their rail station. This study seeks to examine how property values may have changed in response to the Transit Village initiative as we expect any changes in property values to reflect increased demand for housing and commercial real estate within these municipalities.

Our approach to analyzing this question is both analytical and based on selected case studies. We visited six Transit Villages (Belmar, Bound Brook, Burlington City, Journal Square, Metuchen, and Pleasantville City) to document their current status as transit-oriented developments and any recent development activity. We gathered data on both residential property values and commercial rental rates in order to conduct a statistical analysis; we also gathered many other variables that are known to influence property values, ranging from school test scores to crime rates. Various models were tested and discussed, including the estimation difficulties associated with some of our models. We also visually analyzed trends in property values using a graphical analysis; this supplies some supporting conclusions to our overall modeling and case study discussion.

The report begins with an overview and background on the Transit Village initiative, followed by a detailed discussion of our six case study cities. We then proceed to our residential property value analysis, which includes both a cross-sectional time-series analysis, as well as a simple cross-sectional analysis. The theoretical rationale for these modeling approaches is discussed. We follow this with an analysis of commercial rental rates using data obtained from CoStar. We conclude by noting the various caveats in our analysis and draw some potential conclusions from our work.

The Transit Village Initiative

In 1999 the New Jersey Transit Village Initiative was created as a "smart growth" strategy designed to foster transportation-efficient community redevelopment and revitalization around transit facilities (stations and bus hubs) and to reduce traffic congestion and improve air quality by increasing transit ridership. The New Jersey Department of Transportation (NJDOT,) in partnership with NJ Transit, administers the initiative. To be considered for designation, a municipality must have adopted the land use entitlements necessary to advance transit-oriented development (TOD) and demonstrated its commitment to redeveloping the half-mile area around the transit facility into compact, mixed-use neighborhoods with a strong residential component.[1] Specifically, municipalities applying for Transit Village designation are expected to have either undertaken a TOD vision plan, adopted a TOD redevelopment plan or adopted TOD zoning, any of which would demonstration a commitment to TOD.

The rail network in New Jersey is relatively extensive, providing ample opportunity for TOD planning throughout the state. The network consists primarily of the commuter rail service provided by NJ Transit. This includes eight lines, with the main focus being Penn Station in New York City and the terminus in Hoboken directly across the Hudson River from New York. The latter has both ferry and PATH subway connections to Manhattan. PATH serves Hoboken, Jersey City, Newark and Manhattan.

[1] In the New Jersey context, a Transit Village is a municipality that has been designated by the New Jersey Department of Transportation. It is not a single transit-oriented development project, and is not used here to denote such projects. Outside of New Jersey, "Transit Village" is typically used to denote these kinds of projects.

The Hudson-Bergen Light Rail serves communities in Hudson County (connecting Bayonne, Jersey City, Hoboken, Weehawken, Union City and North Bergen) in an area that has seen major development over the last decade. Newark is another focal point of the rail system, lying along the Northeast Corridor. The city is also served by the Newark Light Rail system, historically a relatively small subway system for the city that has been expanded to connect the city's two rail stations, Newark Penn Station and Broad Street Station. In South Jersey, NJ Transit provides rail service between Philadelphia and Atlantic City, SEPTA provides service from two stations in and near Trenton to Philadelphia, and PATCO provides service from Philadelphia to the South Jersey suburbs. The RiverLine, completed in 2004, runs between Trenton and Camden, and was developed partly to spur economic development in older industrial communities along the Delaware River.

According to the 2009 Statement of Qualification for Transit Village Designation[2], several measures are used to evaluate potential Transit Villages, including the presence and potential for:

- Affordable housing
- Bicycle and pedestrian improvements
- Placemaking efforts (e.g., public amenities, such as parks, plazas, and information on historic resources)
- Existence of a local management organization (e.g., Special Improvement Districts, Chamber of Commerce, Urban Enterprise Zone or Main Street organization)
- Community events

To promote TOD, Transit Villages are encouraged to pursue mixed-use redevelopment strategies that include new housing, retail, commercial, and office space while minimizing traffic and improving pedestrian and bicycle access. Non-compatible land uses, such as drive-thru businesses, are to be actively discouraged. Additionally, municipalities applying for Transit Village designation are evaluated on programmatic uses of space, such as farmers' markets, street fairs and other activities that encourage livability.

Designation enables municipalities to deal directly with multiple state agencies through the Transit Village Task Force. The Transit Village Task Force is comprised of the New Jersey Department of Transportation, NJ Transit, the New Jersey Council on the Arts, the New Jersey Department of Environmental Protection, the New Jersey Department of Community Affairs, the New Jersey Economic Development Authority, the New Jersey Housing and Mortgage Finance Agency, the New Jersey Office of Smart Growth, the New Jersey Redevelopment Authority and Main Street New Jersey. In addition, designated municipalities qualify for priority funding and technical assistance from some state agencies, as well as for NJDOT grants. In addition, once a municipality receives a designation, it is entitled to a $100,000 grant, which is typically used for planning but may also be used for physical infrastructure improvements.

Since the program's inception in 1999 the state has designated 20 Transit Villages. These are listed in Table 1 along with the year in which they were designated, the municipality and county in which they are located and the rail line that runs through them. Figure 1 displays these on a map along with the rail network. All except Pleasantville, located near Atlantic City, are at rail stations. Pleasantville is focused on a bus terminal.

[2] Available at: http://www.state.nj.us/transportation/community/village/application.shtm

Table 1: Transit Village Stations

Station	County	Municipality	Rail line	Year designated Transit Village
Belmar	Monmouth	Belmar	North Jersey Coast Line	2003
Bloomfield	Essex	Bloomfield	Montclair-Boonton Line	2003
Bound Brook	Somerset	Bound Brook	Raritan Valley Line	2003
Burlington City	Burlington	Burlington City	RiverLine	2007
Collingswood	Camden	Collingswood	PATCO	2003
Cranford	Union	Cranford	Raritan Valley Line	2003
Elizabeth	Union	Elizabeth	Northeast Corridor	2007
Journal Square	Hudson	Jersey City	PATH	2005
Matawan	Monmouth	Matawan	North Jersey Coast Line	2003
Metuchen	Middlesex	Metuchen	Northeast Corridor	2003
Morristown	Morris	Morristown	Morristown Line	1999
Netcong	Morris	Netcong	Morristown Line	2005
New Brunswick	Middlesex	New Brunswick	Northeast Corridor	2005
Orange	Essex	Orange	Morristown Line	2009
Pleasantville	Atlantic	Pleasantville	Bus Terminal	1999
Rahway	Union	Rahway	Northeast Corridor	2002
Riverside	Burlington	Riverside	RiverLine	2001
Rutherford	Bergen	Rutherford	Bergen County Line	1999
South Amboy	Middlesex	South Amboy	North Jersey Coast Line	1999
South Orange	Essex	South Orange	Morristown Line	1999

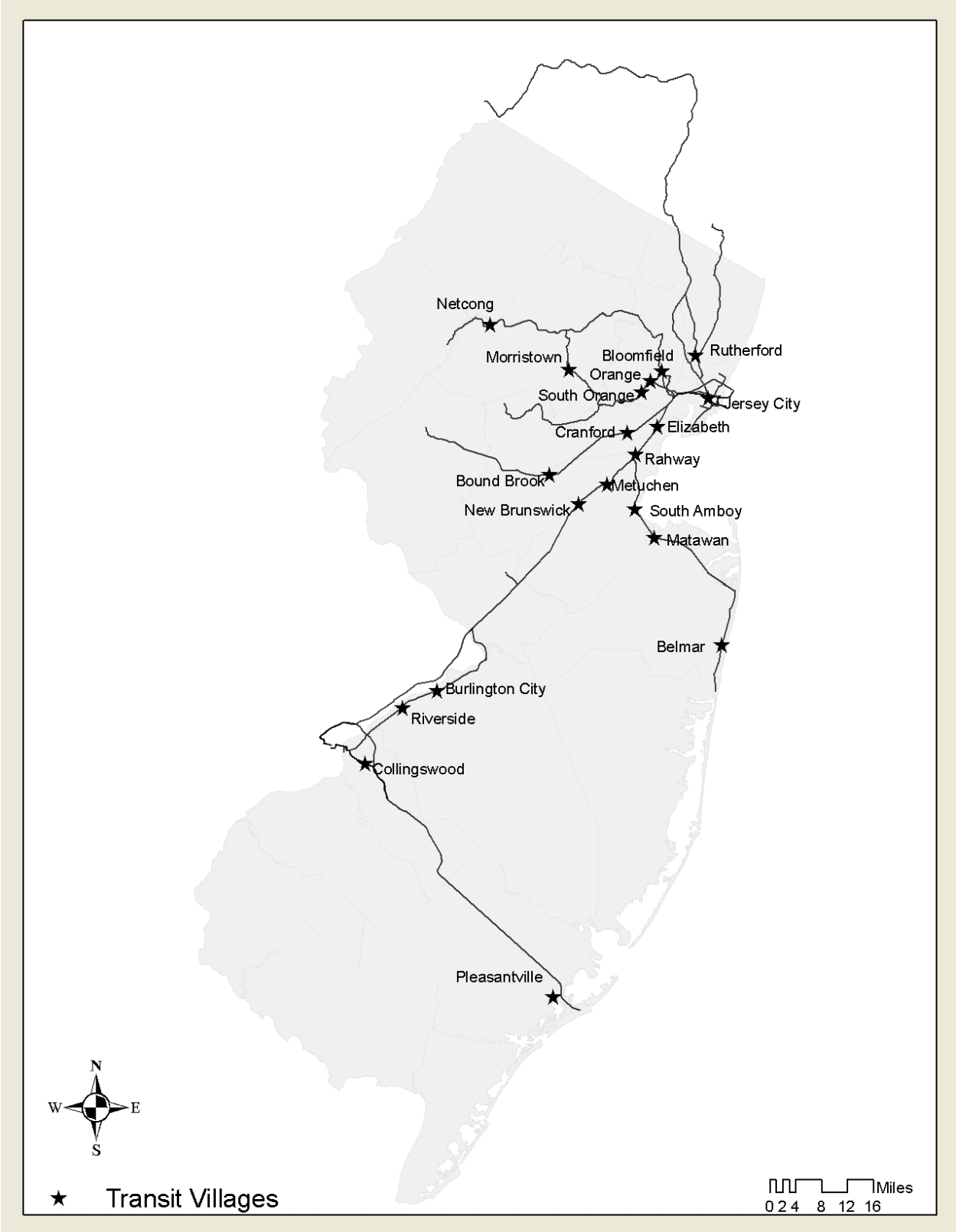


Figure 1: Locations of Transit Villages

Despite the copious nature of the Transit Village application, that evaluation fails to address many of the factors that affect success of a Transit Village.[3] The first comprehensive evaluation of the Transit Village Initiative was conducted in 2003 and identified a number of these factors, both those affecting success as well as those acting as obstacles to the successful creation of Transit Villages in New Jersey.[4] The 2003 Transit Village Initiative Evaluation report concluded that the success of the initiative relied on a strong partnership between State and local government and the private sector, and spelled out factors appropriate for each of these three actors. Success factors related to municipal government is of particular interest for this investigation. These include:

- Strong local leadership
- A history of municipal planning and a sustained vision of redevelopment
- Entrepreneurial attitude
- 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
- Sensitivity to "quality-of-life" issues by including parks, recreation areas, and cultural assets in redevelopment goals

All of these factors can be difficult to engender and to sustain. For example, in Burlington City, former Mayor Darlene Scocca championed the application to the Transit Village Initiative. However, with a change in administration and personnel, support for previously initiated efforts was redirected to other efforts. In the case of Bound Brook, lack of consistent leadership as well as the lack of an on-staff planner has resulted in little improvement in the Transit Village.

Obstacles to Transit Village implementation identified in 2004 were:

- The complicated and expensive process of cleaning up contaminated sites
- Assembling and acquiring properties for redevelopment
- Dealing with the bureaucracy of state agencies to access incentive programs and navigate development review and approval processes[5]
- The overall high cost of development in urban environments
- Parking requirements and costs
- Difficulties related to financing projects and conflict in funding sources
- Resident and local official fears that any new housing development will result in an influx of school children and associated tax increases.

To some extent, most of these difficulties and obstacles represent the issues that good planning can overcome, or at least find cooperative solutions to. So to a large extent, the Transit Village Initiative is an attempt to enhance the planning process by providing a focal point for development. The objective of this study is to evaluate the impact on the value of both residential and commercial real estate. The difficulties of implementation and the sporadic political support in some municipalities actually makes

[3] Success is not explicitly defined, making it impossible to truly assess success against objective measures.

[4] Wells and J. Renne, *Transit Villages in New Jersey: Success Factors, Obstacles, and Recommendations*, New Brunswick, NJ: Voorhees Transportation Policy Institute, 2003.

[5] In the case of Bound Brook, we would add the difficulty with working with federal agencies as an obstacle.

evaluation easier as we are less likely to have an endogenous effect; that is, it is not the Transit Village designation that drives change, but underlying factors that lead to the Transit Village designation.

Transit Village Site Visits

To better inform our statistical analysis we visited six Transit Villages that were of specific interest to the NJAR® Governmental Research Foundation. The site visits allowed us to visually document the development that has taken place, the opportunities that might be present, and the overall walkability of the Transit Village site. The Transit Villages visited are listed in Table 2 **a**nd each is discussed in turn. We include a graphical analysis of residential property price trends for these six Transit Villages, based on average residential sale prices and average equalized housing values for the entire municipality. These values are further indexed to the housing CPI (details on these variables are provided in the Data section). Appendix 1 contains trend graphs for the other Transit Village municipalities. These all show trends relative to the average for either North, South, or Central Jersey respectively. We link this narrative to our discussion of statistical results later in this report.

Table 2: Transit Village Site Visits

Transit Village	Year Designated	Site Visit
Belmar	2003	May 2010
Bound Brook	2003	July 2009
Burlington City	2007	January 2008 & May 2010
Journal Square (Jersey City)	2005	May 2010
Metuchen	2003	July 2009
Pleasantville	1999	June 2010

Belmar Borough

Year Designated: 2003
County: Monmouth
Total Population: 6,045 (2000); 5,908 (2008 est.)
Estimated Transit Village Population: 4,984 (2000)[6]
Transit: NJ Transit rail (North Jersey Coast Line) and bus
Daily rail boardings: 402 (FY08)

Background

Located on the 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 two 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. The completion of the ARC tunnel in 2017 will allow for increased capacity on the line. This, together with a planned change to dual fuel engines, is expected to shorten travel times.

According to local officials, the borough wishes to transform itself into “a sustainable year-round community” by fostering development and redevelopment near the train station and waterfront.

[6] Population living within a half mile of the station, based on 2000 Census.

Discussions concerning redevelopment in Belmar began as early as 1991 and focused on an area located in the northwestern part of the borough. This area was later designated 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 of 2003 Belmar was designated a Transit Village.

Recent planning and development activity

In 2003, Belmar received a $200,000 grant for traffic calming improvements, including diagonal parking. In 2005 the borough was awarded two $50,000 grants from the New Jersey Office of Smart Growth—one for "Development and Redevelopment Plan Assistance" and another for the "Belmar Train Station Redevelopment Project."

Belmar designated Gale Belmar, LLC, a subsidiary of Mack-Cali, as Master Redeveloper of the Seaport Village Redevelopment Area in 2005. The first phase of Belmar's Seaport project began with the demolition of the former DiFeo Seacoast new and used car lots in the summer of 2007. These properties are located at 800 and 710 Main Street, about one block from the station. Remediation of the sites began and continued through 2008. Plans call for the construction of 38 residences, including townhouses and condominiums, 9,500 square feet of ground-floor retail, and covered parking spaces. The project, which is known as East Light, is the product of a joint venture agreement between the DiFeo family and the Master Redeveloper, Gale Belmar LLC. The project has also been recognized for its public outreach efforts. Borough officials and developers met with community members in a series of public meetings and charettes so as to gain input. One outcome of those meetings was the "Presumptive Redeveloper status" of existing property owners, which affirms the rights of property owners to redevelop their own property and limits the use of eminent domain. The East Light project won NJ Future's 2007 Smart Growth Award for its efforts to capitalize on mixed-use, transit-friendly development.

Site visit observations

The area surrounding the Belmar Station appears to be experiencing a transition. The area is currently dominated by surface parking as well as several unoccupied parcels (the former car lots discussed above). However a newly completed project indicates what the future might hold. That project, at the corner of 10th Avenue and Main Street is a three-story, mixed use, residential over retail building. This building type represents a good example of the type of building that would be suitable for a suburban TOD location.

Directly to the east of the station and rail right-of-way is a large shopping center comprised of several one-story buildings and copious surface parking. The buildings are oriented toward the parking, not the street, creating an unpleasant pedestrian environment. A large pedestrian plaza is located between the shopping and Main Street. A potential amenity, though the plaza is not well connected to the station, nor does it have adequate street furniture for prospective visitors.

Residential property value trends

Graphical analysis of the residential property values for Belmar shows that the trend diverged starting about 2001/2002, just prior to Belmar being designated a Transit Village. Planning efforts had begun several years earlier, so we cannot precisely explain this divergence from trends in other parts of Central Jersey, but it may also have been a forerunner to designation as a Transit Village. Post-designation, the divergence in growth rates seems to have persisted.

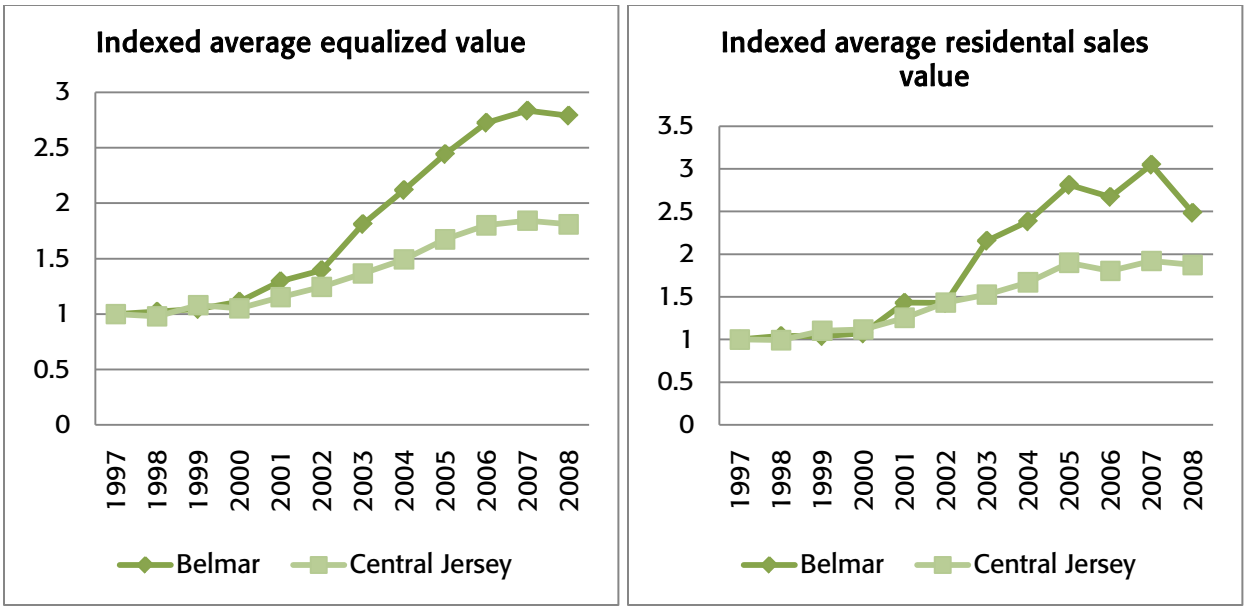


Figure 2. Belmar Transit Village vs. Central Jersey Counties (Hunterdon, Mercer, Monmouth, Middlesex and Ocean Counties)

Figure 3: Shopping center

The station backs up to several one-story retail buildings

Figure 4: Pedestrian Plaza

Located within shopping center, on Main Street

Figure 5: New mixed use

Southwest corner of Main Street & 10th Avenue
Recently completed residential over retail—Nicchio Ristorante (Sign—Condos for rent, MacGowan Agency, 732-280-8100)

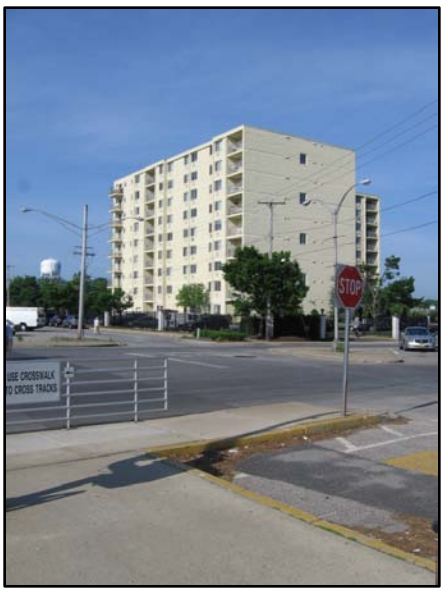


Figure 6: Housing near station

Multistory residential building surrounded by surface parking

Figure 7: Unoccupied lot

Southwest corner of Main Street and 8th Avenue (less than ¼ mile from station)

Figure 8: Unoccupied lot

Northwest corner of Main Street and 8th Avenue
Land is adjacent to parochial school

Bound Brook Borough

County: Somerset
Year Designated: 2003
Total Population: 10,155 (2000); 10,365 (2008 est.)
Estimated Transit Village Population: 4,078 (2000)
Transit: NJ Transit rail (Raritan Valley Line) and bus
Daily rail boardings: 726 (FY08)

Background

Bound Brook was designated a Transit Village in 2003 and is served by NJ Transit's Raritan Valley Line. Trains traveling inbound from Bound Brook terminate at Newark Penn Station. Twenty-five trains travel daily from Bound Brook Station to Newark Penn Station with an average travel time of 47 minutes. Travel to New York Penn Station requires a change of trains at Newark and takes about 77 minutes. A planned change to dual fuel engines and increased capacity into New York Penn Station that will come with the completion of the ARC tunnel in 2017 is expected to shorten travel times and increase service to/from Bound Brook.

The borough, situated along the Raritan River in Somerset County, is subject to frequent flooding. In 1999 the borough was devastated by flooding due to Hurricane Floyd, resulting in an estimated $70 million of damage in Bound Brook.[7] Considerable flooding also occurred in the spring of 2007 and again in spring 2010. Currently the U.S. Army Corps of Engineers and the New Jersey Department of Environmental Protection (NJDEP) are advancing the final phase of the Green Brook Flood Control project which is designed to protect the borough from future inundation. In 2009 $10 million in federal funds were allocated to the Green Brook Flood Control Project, but current estimates suggest that the project will require at least $23 million to be completed. As of April 2010, the Green Brook Flood Control Commission stated that the project would take at least another two years to be completed.

In 2001, Bound Brook received a federal grant of $230,000 to update the streetscape along downtown Main St. (http://www.nj.gov/transportation/commuter/bike/projdatabase.shtml)

Recent planning and development activity

In fall 2009 the NJ Department of Community Affairs (NJ DCA) awarded Bound Brook's Economic Development Advisory Committee (EDAC) a $50,000 Smart Future grant to develop a Transit-Oriented Design Plan. The EDAC commissioned the Regional Plan Association (RPA) to consult. Together EDAC and RPA hosted a visioning session that brought together residents, business owners, elected officials and designers to discuss future economic development of Bound Brook.

Site visit observations

With flood control projects uncompleted, the Bound Brook Station area has been languishing. While considerable infrastructure improvements and repairs are done, including the traffic circle completed in 2005, uncertainty about when the entire flood improvement project will be completed and its effectiveness seems to have dampened the attractiveness of the location to residents and businesses. At the time of our visit in fall 2009, there were six commercial properties for sale and 12 for lease within

[7]According to the Green Brook Flood Control Commission. The US Army Corps of Engineers estimated total flood damage from Hurricane Floyd at $80 million.

the immediate station area. Discussions with a REALTOR® for one of the properties confirmed this observation.

Residential property value trends

Trends in residential property values in Bound Brook match those in other North Jersey municipalities. In this case we see no impact of the Transit Village designation, either proceeding or after designation. This confirms our knowledge of Bound Brook not making much progress on developing their Transit Village, partly due to the uncertainty associated with flooding.

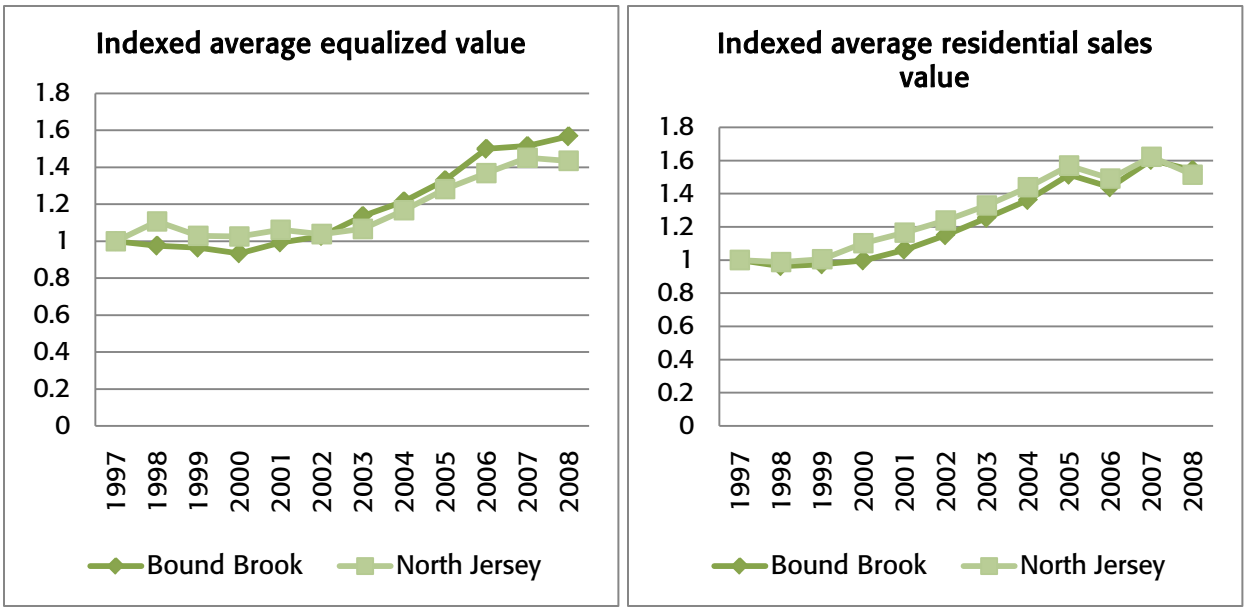


Figure 9: Bound Brook Transit Village vs. North Jersey Counties (Bergen, Essex, Hudson, Morris, Passaic, Somerset, Sussex, Union & Warren Counties)

Figure 10: Traffic circle (round-a-bout)

North end of Bound Brook's downtown

Figure 11: Unoccupied bank

Adjacent to the NJ Transit station

Figure 12: East Second Street

Photo taken during March 14, 2010 flood
Source: Andrew Miller/Courier News

Figure 13: NJ Transit Parking lot

Photo taken during March 14, 2010 flood
Source: Andrew Miller/Courier News

Figure 14: Voorhees Building

East Main Street and Maiden Lane

Figure 15: Commuter lot

Surface parking lots, located between rail right-of-way and East Main Street are potential sites for future redevelopment

Burlington City

County: Burlington
Year Designated: 2007
Total Population: 9,736 (2000); 9,396 (2008 est.)
Estimated Transit Village Population: 4,267 (2000)
Transit: NJ Transit rail (RiverLINE light rail) and bus
Daily rail boardings: 543 (FY08)

Background

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, where riders can access the Northeast

Corridor Line traveling to New York, SEPTA and AMTRAK, and to the south with Camden, where riders can reach Philadelphia using the PATCO Line. The Burlington Towne Centre Station is one of two stations in the municipality; the other is the Burlington South Station located about 0.6 miles to the south.

Recent planning and development activity

The RiverLINE has fostered what former Mayor Darlene Scocca termed a "renaissance"—with six businesses opening in the downtown area during the first year of the line's operation. Burlington City's current station area 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. The plan includes a community visioning process, a land use and circulation plan, and design guidelines to ensure the transit-friendly downtown revitalization includes community input. Burlington City is planning the redevelopment of several properties.

In 2007 the city approved a proposal for 38 townhouses to be built on the site of the former Gregory's Department Store, on Washington Avenue, between Cherry and Juniper streets. Also in 2007 Burlington City issued a request for qualifications for interested parties to develop an unoccupied parcel of land on High Street at the Delaware River waterfront that the city currently uses for overflow parking on festival days. Plans for the parcel call for mixed-use development. The waterfront location is viewed as a draw for potential development, but will entail approvals by NJDEP, given its location. The city also has a redevelopment agreement with Westrum Development Company for a new residential project to be built on a site located on Tatham Street, between East Broad and East Pearl streets. Plans for the Tatham Mews project call for between 92 and 95 residential units. This property is located along the Assisscunk Creek and is the site of a former foundry and will need NJDEP approval.

Site visit observations

Burlington City is home to a large number of historic structures reflecting its 400-year settlement history. The Burlington City historic district is comprised of 40-plus noteworthy structures; most are located along Broad Street (the RiverLINE alignment) and High Street, the community's main thoroughfare. The community is very walkable, with wide sidewalks and short block lengths, also a vestige of its past. Recent improvements to pedestrian infrastructure, including rebricking and repointing of sidewalks helps to reinforce the historic nature of the community.

Future construction in Burlington is likely to be low-rise (two- to three-stories) in keeping with the current building fabric. Other opportunities for redevelopment exist in the upper stories of existing buildings and on surface parking lots, especially the large municipal lot that is situated between High Street and Stacy Street.

Residential property value trends

Average property values in Burlington City are lower than average for South Jersey and the growth trend has also been below the average. The Transit Village designation has not had any impact on property values, although given that this occurred in 2007 it may be too early to assess. The RiverLINE was built partly as a revitalization strategy for communities along the Delaware River and having opened in 2004, we see no impact on property values in Burlington City even from the completion of the RiverLINE.

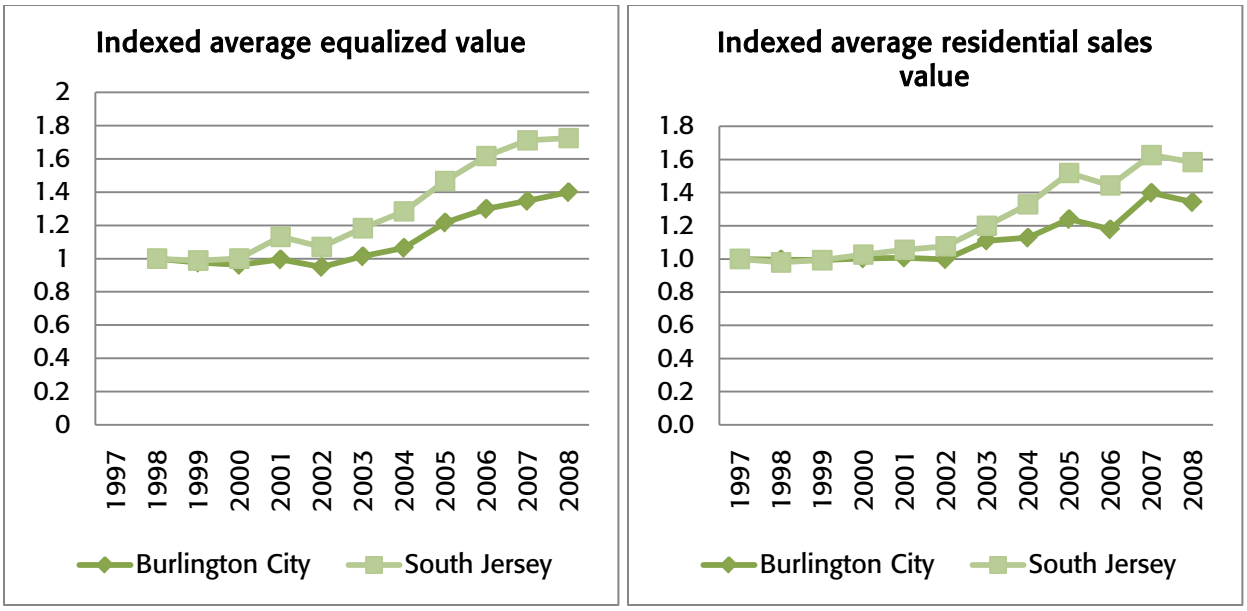


Figure 16: Burlington City Transit Village vs. South Jersey Counties (Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem Counties)

Figure 17: Burlington City Station

Figure 18: The Revell House

213 Wood Street
Built 1685, the Revell House is the oldest building in Burlington County and one of the oldest residences in New Jersey

Figure 19: Burlington Pharmacy

301 High Street, at East Union Street
Built 1731, the Burlington Pharmacy is reportedly the oldest pharmacy in continuous operation in the state and is said to have once been a center of anti-slavery activity in the county

Figure 20: Friends Meetinghouse

341 High Street, between Broad Street & Smith Lane
Built 1785 and a Quaker meeting place for over 300 years, the facility is currently available for meetings and conferences

Figure 21: The Lily Inn

214 High Street
Built in 1709 and renovated in 2008, The Lily Inn opened in fall 2008 as a five-bedroom bed & breakfast

Figure 22: Liberty Belle Ship

Delaware River, north end of High Street
Part of the city's tourist efforts, the historic 600-passenger ship is available for lease

Figure 23: The Herman T. Costello Lyceum Hall, Center for the Arts

432 High Street
Built 1839, Lyceum Hall served as Burlington City Hall from 1851 until 2003. In 2008 the city renovated the building, using $800K in its own funds and a $300K NJ Small Cities grant to make the building ADA compliant. The facility houses a 2,000 square foot flexible performance space, gallery and classroom space

Figure 24: Improved pedestrian infrastructure

Journal Square, Jersey City

County: Hudson
Year Designated: 2005
Total Population: 240,055 (2000); 241,114 (2008 est.)
Estimated Transit Village Population: 38,462 (2000)
Transit: Port Authority Trans-Hudson (PATH) and bus
Average weekday traffic: 25,217 (2007)

Background

Designated in 2005, Journal Square is the most densely populated and urban of all Transit Villages and is one of Jersey City's, and New Jersey's, transit and commercial hubs. It is anchored by a major station on the PATH transit system linking Jersey City with lower and midtown Manhattan, Hoboken and Newark. It is the site of a large bus facility. More than eight million rail and bus passengers annually use the transit facilities at the Journal Square Station. The Journal Square Station is situated midway between the 33rd Street Station in midtown Manhattan and Newark Penn Station. Travel time between Journal Square and 33rd Street Station in midtown Manhattan is 22 minutes; 26 minutes when trains also stop at Hoboken Station. Travel time between Journal Square and Newark is also 22 minutes. Travel time to the World Trade Center Station is 11 minutes. Service is frequent, regardless of destination. Trains depart every four to five minutes during commute times, every 10 to 15 minutes most of the day and evening hours, and every 30 minutes during overnight hours. Single fares cost $1.75. Commuter costs are reduced $1.30 per ride by purchasing a multiple trip SmartLinks℠ Card.

Recent planning and development activity

In October 2008 Mayor Jerramiah Healy announced an ambitious plan to transform Journal Square into a pedestrian-friendly commercial and residential urban center. Currently, the area is dominated by surface parking lots, wide streets, traffic congestion and struggling businesses. "Vision Journal Square" would remake the 244-acre site, adding more than 10,000 new housing units and millions of square feet of commercial space as well as nine acres of parks and open plazas. The creation of a two-mile greenway would connect a renovated Journal Square Station with the city's redeveloped waterfront—creating the longest continuous urban walkway in the nation. The plan calls for buses and taxis to be the only motorized traffic allowed in Journal Square. Officials haven't offered an overall cost estimate, but believe that funding will come from public-private partnerships in addition to tax abatements to encourage private investment. A number of historic structures, such as the Loew's Theater, a Journal Square landmark, will remain. The entire effort could take 15 years to complete.

Jersey City has been the site of considerable residential and non-residential redevelopment over the past several years. However most of the new construction has been near the waterfront, not in the Journal Square Transit Village district. According to city officials, the Journal Square Transit Village district saw the construction of 130 new housing units between January 2005 and December 2007. There was also one significant non-residential project in the Transit Village in 2005—the renovation of 35 Journal Square, formerly known as The Trust Building. This work entailed the rehabilitation of ground floor retail and 11 floors of office space in a 196,000 square foot building.

The groundbreaking for the Journal Square City Center Towers was held in spring 2009. This project is 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. When the project was proposed the first residential units were to be occupied in 2010. However, the project has made little progress due to current economic conditions.

Site visit observations

Journal Square is the most urban and most populated of the New Jersey Transit Villages. However, while considerable redevelopment has occurred elsewhere in Jersey City, particularly along the waterfront and near some Hudson-Bergen Light Rail stations, little has taken place at Journal Square. The Journal Square Transportation Center, dating from the 1970s, is comprised of a ten-story office tower, grade-separated pedestrian plaza, and parking deck. The area surrounding the station is currently dominated by several surface-level parking lots, traffic congestion, and marginal businesses.

Pedestrians currently are at a disadvantage, having to transverse overly wide roadways such as JFK Boulevard's nine lanes of traffic. Efforts will need to be taken to improve pedestrian amenities and to support the kind of active street life that is possible in such an urban place.

Despite Journal Square's shortcomings, the seeds of a truly livable, transit-supportive community are in place. It is clear that transit in the location is well utilized, and that many PATH riders access the station on foot or via one of numerous buses that connect to the station. Excellent transit connections to New York City make the location viable. Additionally, housing and commercial uses will enhance the location. Moreover, visitors can see vestiges of a more glorious past, the Loew's Theatre and other Art Deco façade – assets that should be preserved and used as keystones in any future redevelopment of the area.

Residential property value trends

Our valuations of property values are based on all of Jersey City, thus we cannot draw specific conclusions on trends around Journal Square. For Jersey City we see a divergence from the North Jersey average growth (starting in about 2000 when we use the equalized valuations and 2004 when we use average residential sales prices). Compared to the North Jersey average, property values are in general lower, perhaps reflecting the lower income demographic composition of much of Jersey City.

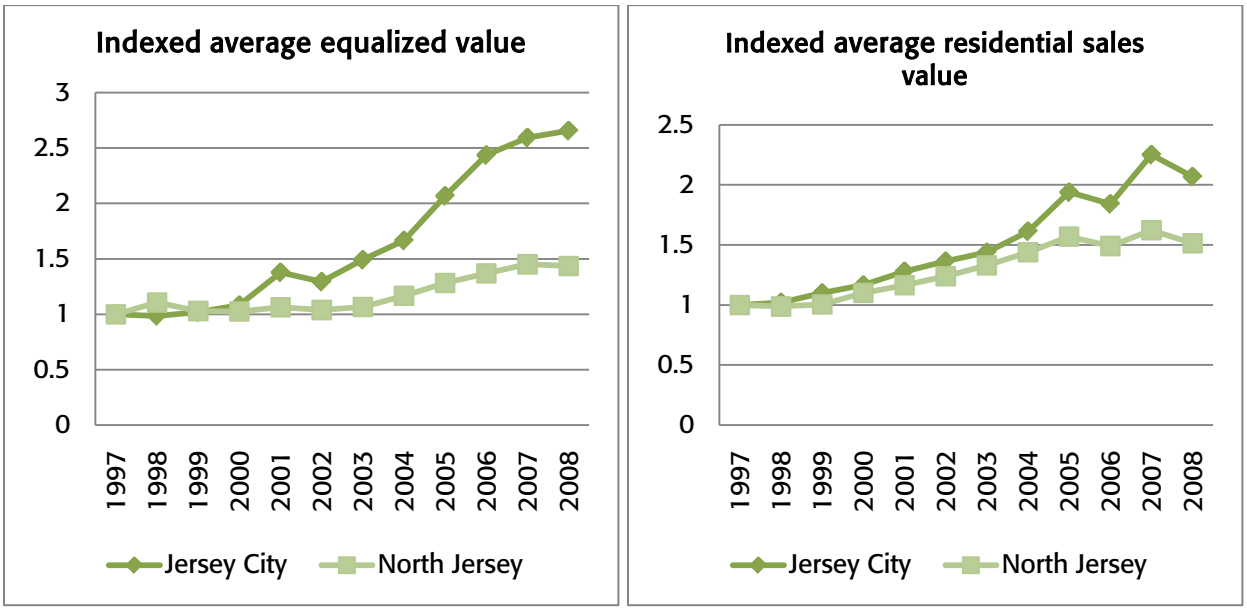


Figure 25: Jersey City (Journal Square) Transit Village vs. North Jersey Counties (Bergen, Essex, Hudson, Morris, Passaic, Somerset, Sussex, Union & Warren Counties)

Figure 26: Journal Square signage

Figure 27: Art Deco façade

Corner of Bergen Avenue and Newkirk Street
Several buildings are graced by well-preserved Art Deco facades

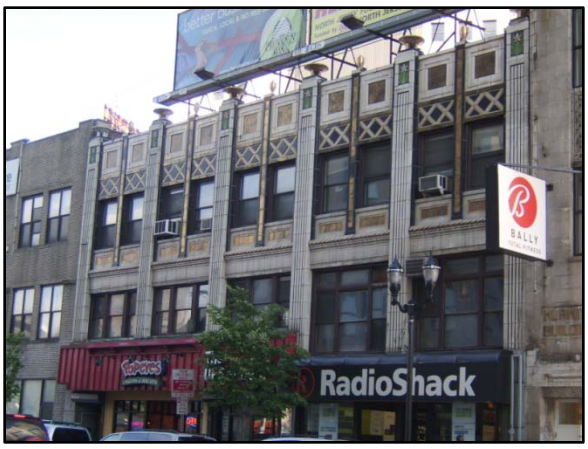


Figure 28: Historic façade

924 Bergen Avenue

Figure 29: Historic Loew's Theatre

54 Journal Square
Redevelopment of Journal Square will preserve the Loew's Theatre and several other historic structures

Figure 30: Journal Square Plaza

Site of the future Journal Square City Center Towers in background (beyond chain link fence)

Figure 31: Pedestrian conditions

Pedestrians face difficulty when crossing nine lanes of traffic at John F. Kennedy Boulevard. Medians partially mitigate conditions, but additional improvements are needed

Metuchen Borough

County: Middlesex
Year Designated: 2003
Total Population: 12,840 (2000); 13,098 (2008 est.)
Estimated Transit Village Population: 5,906 (2000)
Transit: NJ Transit rail (Northeast Corridor Line) and bus
Daily Rail boardings: 4,001 (FY08)

Background

In 2003 Metuchen was designated New Jersey's eighth Transit Village. Metuchen's NJ Transit station is located on the Northeast Corridor Line and provides easy access to Newark and New York City to the north and New Brunswick, Princeton and Trenton to the south. Express service to Newark takes 30 minutes. The station is an important contributor to Metuchen's lively downtown. 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.

Recent planning and development activity

The borough has helped to foster redevelopment and infill of over 100 acres of land into mixed-use, commercial and civic space and has created over 500 affordable and market rate residential units within a ten minute walk of the station. For example, in 2002 the Franklin Square resulted in 105 new residences of infill development.

The borough has also sought to enhance its pedestrian amenities. A major campaign focusing on traffic calming 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.

In 2007 Metuchen received a $50,000 New Jersey Department of Community Affairs (NJ DCA) Smart Future grant to support its community design efforts. The grant funded public outreach efforts that explored issues related to the borough's redevelopment. Workshops, site visits and open houses were held as part of planning for redevelopment along the New Street corridor—the street that connects Metuchen's Main Street and Lake Avenue (Route 27)—and the parking lots located along New Street and the rail line, including the municipally-owned Center Street and New Street parking lots.

Work has begun on the redevelopment of the former supermarket site, located at the corner of Lake Avenue and Middlesex Avenue. The District at Metuchen will include four mixed-use retail and residential buildings providing a minimum of 121 new residences and a new 15,600 square foot grocery store. Plans call for a parking structure to be wrapped by other uses. Overall 501 parking spaces will be provided including on-street parking, surface parking and in the garage.

Site visit observations

Metuchen has made efforts to enhance its central core, which includes the area near the station. The borough has a lively downtown district, located along Main Street, primarily between the rail station and Middlesex Avenue. This district is comprised mostly of first floor businesses with office and residential uses above that create a continuous street wall and an attractive shopping district. This is despite the nearby presence of significant auto oriented shopping along Routes 1 and 27.

Improvements to pedestrian amenities are apparent – attractive paving, pedestrian activated warning lights, and street furniture. The surrounding neighborhood is predominately single family homes, with some multifamily and the aforementioned Franklin Square development.

A long term plan to redevelop numerous surface parking lots is underway, starting with redevelopment of the former supermarket site, located in the western part of the Transit Village, about a quarter mile from the station. Other surface parking lots are located along the rail right-of-way and behind the Main Street shops.

Residential property value trends

Residential property values in Metuchen are slightly below the average for Central Jersey. The growth trend is also somewhat lower. This is surprising as Metuchen has some very attractive features for a transit-oriented development. Our evaluation of commercial real estate trends does not show much effect, except for industrial rents (see discussion in section on commercial real estate).

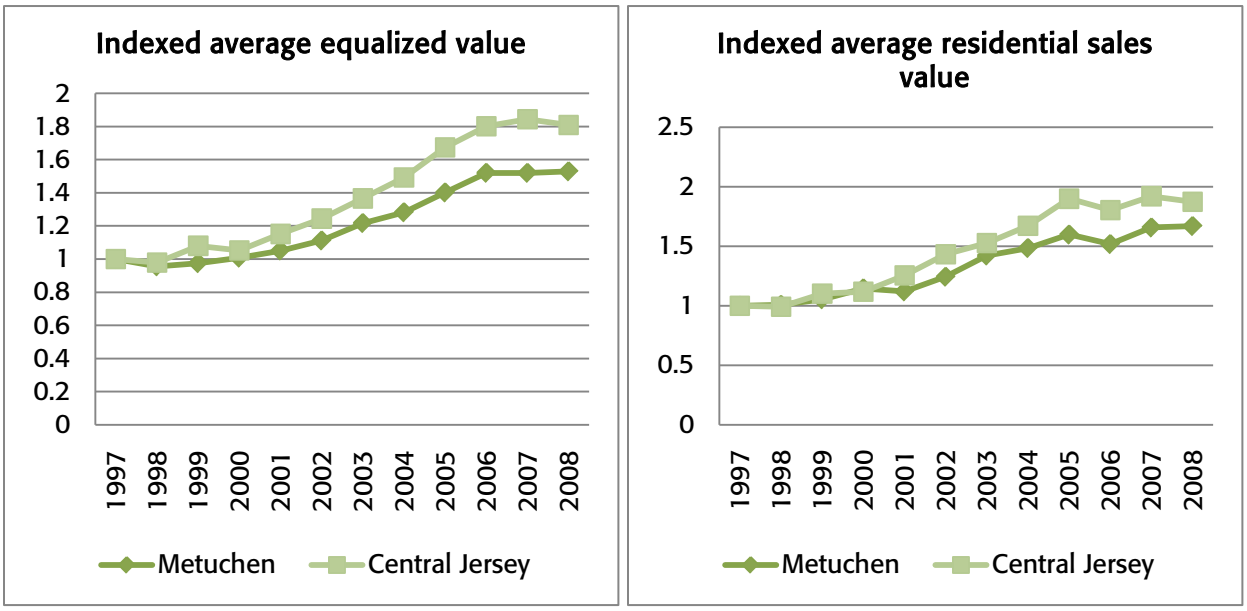


Figure 32: Metuchen Transit Village vs. Central Jersey Counties (Hunterdon, Mercer, Monmouth, Middlesex and Ocean Counties)

Figure 33: Demolition of former supermarket

Corner of Lake Avenue & Middlesex Avenue
Future home of The District at Metuchen, mixed-use retail and residential

Figure 34: Franklin Square

Built in 2002, Franklin Square added 105 residences to Metuchen's downtown

Figure 35: Project on Middlesex Avenue

Work on this mixed-use project stalled due to economic conditions

Figure 36: Metuchen Concierge Company

No longer in operation, the Metuchen Concierge Company provided personal services to transit riders and others

Figure 37: Walking map

The Robert Wood Johnson Foundation funded "Walk Metuchen" program mapped routes throughout the borough. The paths connect outlying neighborhoods with the downtown and the station

Figure 38: Pedestrian amenities

Metuchen improved its walking environment by installing pedestrian activated warning lights

Figure 39: Street furniture

Metuchen maintains excellent benches and other amenities for pedestrians

Figure 40: Freedom Plaza, Metuchen Station

East bound entrance to station

Figure 41: Street life

Metuchen's businesses enliven the community through sidewalk cafés and other activities

Pleasantville City

County: Atlantic
Year Designated: 1999
Total Population: 19,012 (2000); 18,853 (2008 est.)
Estimated Transit Village Population: 7,134 (2000)
Transit: NJ Transit bus (ridership figures are not available)

Background

The city of Pleasantville was one of the first five communities to be designated a Transit Village. It has the distinction of being the only bus-oriented Transit Village to date. The focal point of the Pleasantville Transit Village is the Pleasantville Bus Terminal, located on East West Jersey Avenue. Built in 1999, the terminal provides an indoor commuter waiting room, restrooms and a concession. Bus service connects Pleasantville with many of its surrounding communities including Hamilton Township (the site of Atlantic Cape Community College), Egg Harbor Township, Ocean City, Linwood and Atlantic City. More than 13 percent of the city's work force commutes each day by bus.

Parts of the Transit Village are located within Pleasantville's urban enterprise zone. The municipality has been the recipient of numerous grants that have benefited the Transit Village district. Recently the city has invested significant funding to improve the streetscape and façades along Main Street and West Jersey Avenue.

Recent planning and development activity

Pleasantville adopted its City Center Redevelopment Plan in 2006. The plan, now in its second phase, envisions redevelopment of 30 acres of the downtown. In summer 2008, the city began negotiations with River Development, LCC of Port Monmouth for a project known as The District. The District project would redevelop the blocks bounded by West Jersey Avenue, North 2nd Street, West Grant Avenue and Main Street. In November 2009 Pleasantville signed a master developer's agreement with River

Development for the City Center Redevelopment project. Plans call for the shops, restaurants and a grocery store at store level, with office and residential space above. The initial phase of the project calls for 300 workforce housing units and 20,000 square feet of retail space. The project, by virtue of its location in the Pleasantville Urban Enterprise Zone (UEZ), will use Zone Assistance funds for professional services to implement the redevelopment as well as other UEZ funds to purchase properties within the redevelopment area.

Site visit observations

Pleasantville is the only New Jersey Transit Village that is served solely by buses. The area is primarily low-scale (one- and two-story) buildings. The area has been hard hit by the downturn in the economy. Many of those living in Pleasantville work (or worked) in Atlantic City, which has experienced a 25 percent decline in revenues between 2009 and 2010.

The downturn in the economy is reflected in Pleasantville's retail properties. Many of the downtown's shops are vacant and there appears to be little recent investment. The only new construction within the Transit Village area is the One Stop Workforce Center, located at the corner of South Main and East Washington, about a block from the bus terminal. Additionally, façade improvements have been made along Main Street. However, retail viability within the Transit Village may be hindered by the presence of several strip shopping centers located along the Black Horse Pike (highway) no more than a mile from the bus terminal. A freight line is also located behind the bus terminal, which may reduce pedestrian connectivity to the north of the terminal.

That being said, site preparation is progressing on The District project as several buildings within the development area have been razed. On the day of the site visit, the bus terminal was well patronized.

Residential property value trends

In general, residential property values in Pleasantville are below average, reflective of the demographics of the community. Despite this, valuations seem to have tracked average growth and have not diminished in value. This is reflected in the trend graph for equalized values. The average residential sale price shows a one-time drop in 1998, which may be an aberration in the data as growth generally tracks the average thereafter. We also present this figure indexed to 1998 to show that the residential sales value tracks the average if the 1997 value is omitted. While the Transit Village designation does not seem to have had an effect, it is possible that it enabled property values to maintain a growth rate similar to the rest of South Jersey.

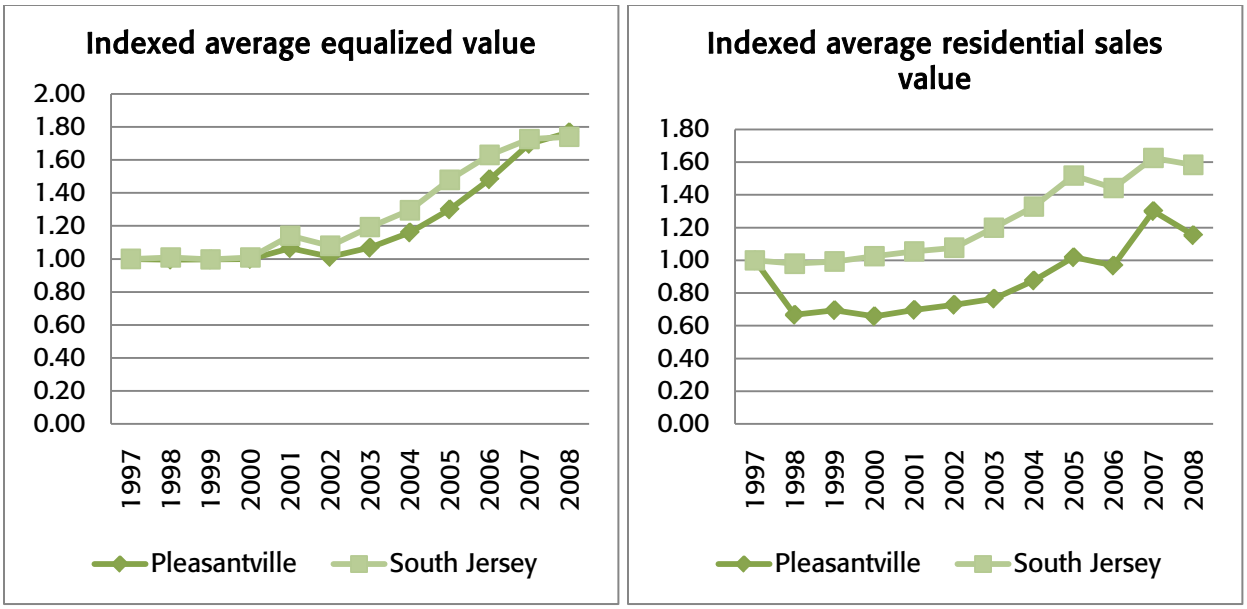


Figure 42: Pleasantville Transit Village vs. South Jersey Counties (Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem Counties)

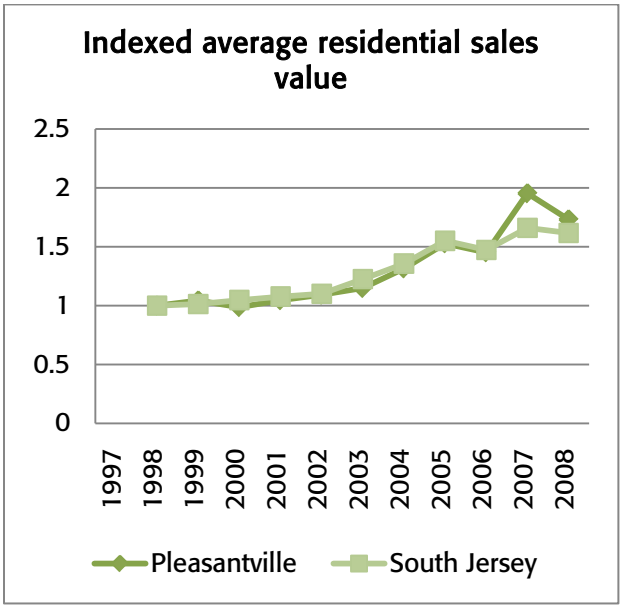


Figure 43: Pleasantville Transit Village vs. South Jersey Counties indexed to begin in 1998.

Figure 44: Pleasantville Bus Terminal

The terminal faces E West Jersey Avenue, which has received new paving and street lighting

Figure 45: Pleasantville Bus Terminal

Passengers await arrival of bus

Figure 46: View from Bus Terminal Plaza

W West Jersey Avenue and South Main
Note pedestrian improvements—sidewalk, crossings, street lighting

Figure 47: Façade improvements

South Main Street
Recently renovated mixed use, residential over retail (retail was unoccupied at time of visit)

Figure 48: Façade improvements

Faux second floor facades were added to maintain street wall

Figure 49: One Stop Career Center

New construction

Evaluation of Residential Property Prices

Academic research has typically found that people will bid up the price of housing that is accessible to good transportation and in particular good transit access. Thus, we would expect that municipalities with good transit access, especially to New York and Philadelphia, would have relatively higher prices, all else equal, than municipalities with less access. The Transit Village Initiative is designed to encourage more development, both commercial and residential, near transit stations. Our analysis, therefore, focuses on whether residential property prices have increased for those municipalities with Transit Villages.

One of the key issues is that the price of housing is not determined solely by access to good transit. For this reason, our modeling work included other control variables, such as the crime rate, school quality, and population density. We attempted several approaches, including a time-series cross-sectional model, as well as a cross-sectional model of changes in prices. We find some small statistically significant association between increased residential property prices and whether there is a Transit Village designation, but there are various statistical issues with the analysis that imply these results should be interpreted cautiously.

Research to evaluate how housing prices are affected by various factors usually uses the actual sale price for individual units. We opted to use average municipal values (using two different measures of value) for several reasons. First, the data at the municipality level allows us to use panel data methods that account for heterogeneity across municipalities. Simply put, this allows us to control for unmeasured attributes that may affect housing values. Second, much of the readily available data is recorded at the level of municipalities, making this a convenient unit for analysis. Finally, as we are seeking to determine how the Transit Village may affect the municipality as a whole, our approach uses the relevant unit of analysis. Further, when individual housing units are analyzed, one requires detailed information on housing characteristics which may not be available. Another issue is that often housing values are lower when very close or adjacent to a rail station due to various negative externalities such as increased traffic and noise, and possibly perceptions of crime; however, values increase within a short walking distance (Bowes, Ihlanfeldt 2001). Thus, our averaging at the municipal level will average out these extreme localization effects.

The following presents details on our analytical approach, discusses the source of our data, and then presents the results of our analysis. We discuss various caveats to our analysis, and draw some tentative conclusions on the effect of the Transit Village program on housing values.

Theory and methods

Theoretically we expect that those areas with a Transit Village may have greater accessibility and thus we would see an increase in property values. Our analytical approach seeks to examine how housing values are affected both by the designation of a Transit Village and other factors that are typically associated with housing values. Specifically we include information on population density, crime, the effective property tax rate, school test scores, and the number of riders using the rail station.

One difficulty with this sort of modeling is that our independent variables are not strictly exogenous. Some may be the result of higher housing prices. For example, better test scores may reflect socio-economic factors that are a result of higher housing prices. The designation of a Transit Village may also be endogenous in that those areas that were designated may have been seen as ripe for development due to increased demand and higher property values.

Another modeling issue is that property values are largely dependent on the property value in prior years. Thus, we need to include the prior year's property value as a lagged dependent variable in our

model. This introduces a problem of serial correlation which leads to a violation of the statistical assumptions in a basic ordinary least squares regression model in that the error term is no longer independently distributed. For practical purposes this means that the test statistics are unreliable. We use the Prais-Winsten method to correct for this and we discuss these estimates in our results section. Using a lagged dependent variable also provides the opportunity to develop a causal model using a Generalized Methods of Moment estimator, which uses instruments of both lags and differences of the dependent variables. However, these methods are very sensitive and as we discuss below our instruments are very weak, making the estimates unreliable and potentially erroneous.

Our theoretical model is the following:

$$\ln(P_{it}) = \beta_1 \ln(P_{i,t-1}) + \beta_2 D_{it} + \beta_3 S_{it} + \beta_4 C_{it} + \beta_5 T_{it} + \beta_6 R_{it} + \beta_7 V_{it} + \sum_{1}^{t-1} \beta_t Y_t + \alpha_i + \eta_{it},$$

where *P* is the average sales price for the spatial unit of analysis, in this case a municipality, which is also lagged by one year on the right-hand side. *D* represents the population density (which proxies for demand for housing), *S* is school quality (based on test scores), *C* is crime (total murders or violent crime rates), *T* represents the tax rate, *R* represents the number of rail riders accessing stations in the municipality, and V represent the designation of whether it is a Transit Village. We also include a year dummy variable, Y, which controls for similar factors that vary over time in each municipality. The β are parameters which are estimated, the α is a fixed effect parameter, and η is the error term. The estimate is across all spatial units, *i*, and time series, *t*.

Other variables would in theory be desirable to include. These include the relative walkability of the station area, a measure of distance to the station, and distance from New York or Philadelphia. However, some of these variables do not change over time (or we do not have time-varying data available); in a fixed effects model they will be correlated with the fixed effect term and will thus drop out of the model. In theory these types of time-invariant measures are controlled for by the fixed effect term (a categorical variable for each municipality less one) but we cannot draw any conclusions about how they may affect the dependent variable. This shortcoming is actually one of the benefits of using a panel fixed effect method, as it enables us to control for unmeasured attributes that likely affect the dependent variable. This is beneficial given our focus on assessing the Transit Village variable.

The specification of the equation above is log-linear. This involves taking the logarithm of the dependent variable regressed against the linear values of the independent variables (except for the lag of the dependent variable which is also in logarithmic form). This is considered a better specification for hedonic models of this type.

We have various expectations about the effects we expect from our modeling. First, our working hypothesis is that we will find that Transit Village designation increases housing values. It is possible however, that Transit Villages will see an increase in the supply of housing that leads to an indeterminate effect on the value of housing. We control for the number of housing units and expect this to exhibit a negative sign; although higher housing values may also be contemporaneous with increased supply. Crime is assumed to have a negative association with housing values, as are poor student test scores. Other control variables include the population density, which could work both ways; first, higher densities typically are associated with higher land values, however this may not affect housing values if supply is adequate, so the effect may be indeterminate. The effective property tax rate is also used as a control and our expectation is that this would have a negative association.

In the next section we discuss the data used in the analysis and the source of the data. This is followed by our analysis results.

Data collected

Our analysis strategy was designed to model housing prices based at the municipal level. This allows us to take advantage of municipal level features that are hypothesized to have an effect on housing values. Therefore, we collected relevant data at the level of the municipality over a number of years to produce a cross-sectional time-series data base for analysis. We also had some data that was only available as a cross-section which we also used in a cross-sectional analysis that could not take advantage of changes over time.

Educational variables (2000-2008)

The New Jersey Department of Education (NJDOE) administers testing of public school students and makes these results public. From 1997 to 2002 NJDOE administered the Elementary School Proficiency Assessment (ESPA) at grade four to measure student achievement in core curriculum—verbal knowledge and mathematics. In 2003, the NJDOE replaced EPSA with the New Jersey Assessment of Skills and Knowledge (NJ ASK). The NJ ASK also tests proficiency in verbal and mathematical skills for students in grades three through eight as well as proficiency in science in grade four. Though the two tests are not directly comparable (and should not be used to measure change in a single school or district over the entire period), taken together, the assessments provide a good measure of the overall quality of a district compared to other districts within a given year, however we opted not to use this given the discrepancy between years.

The NJDOE also makes available Scholastic Assessment Test (SAT) scores by school starting in 2001. These scores were averaged for all schools within a school district and associated with the appropriate municipalities. In order to gauge school quality within a municipality, school districts were mapped and assigned to the appropriate jurisdiction. When residents of municipalities send students to schools located outside its borders (to a regional school or through send/receive relationships) municipalities were associated with the appropriate district. We use the sum of the Math and Verbal SAT scores.

The series is generally complete with only one municipality not having data (and also lacking crime data). In total, only 11 missing values occur across all municipalities and years. The NJ ASK4 data has 116 municipalities with data missing for some years and a total of 306 missing records in total.

Crime (1994-2008)

The Federal Bureau of Investigation (FBI) collects and makes available data on offenses known to law enforcement. These data are available by municipality annually and include information on violent and nonviolent crime. The perception of crime (or lack of safety due to crime) was considered for its impact on property values. In particular, we included violent crime, murder (murder and non-negligent man-slaughter) and aggravated assault in our models. Municipalities with fewer than 10,000 residents tended not to have crime data available from the FBI database, thus we lose 75 municipalities in any analysis that includes this variable. None of these are Transit Village communities and none have rail stations, so we don't expect this omission to affect our results.

Ridership (2000-2008)

VTC received data on the ridership from providers for each fixed transit (RR, LR, HR, CR) station within the state. Data were provided by NJ TRANSIT, PATH, SEPTA, and PATCO. These data were aggregated to the municipal location of the station and standardized (averaged) across the number of stations within the municipality.

Population, Land Area, Population Density (2000-2008)

Population estimates for municipalities were obtained from the NJ Department of Labor and Workforce Development. Land Area was obtained from the US Census. Population density was calculated for each municipality.

Tax Rates (2000-2008)

Information on tax rates is derived using the equalized tax rate. This is a tax rate that equalizes the relative assessment across municipalities. The state creates a statistically designed measure based on sales data to develop state equalization ratios. This ratio is then multiplied with the general tax rate to determine the equalized tax rate. Data was obtained from the NJ Department of the Treasury.

Number of Housing Units (2000-2008)

The number of housing units within the municipality was obtained from the NJ Department of Labor. This is used to control for the supply of housing.

Property Valuation Variables (1994-2008)

The property valuation is our key dependent variable. We use two different variables obtained from the NJ Department of the Treasury. One measure is the equalized value. This is an average of the preceding three years of the total aggregate equalized valuation by municipality. This 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. To obtain a per unit measure we divide by the total number of housing units in the municipality.

We also used the average residential sale price of all units within a municipality. This averages the transactions that occurred within a given year and thus provides a measure of actual value. It may be somewhat biased downwards because of non-arms-length transactions, but assuming that this bias is the same across municipalities and years it should not affect our analysis.

Both measures of valuation are indexed using the Consumer Price Index for housing. For the north Jersey counties within the North Jersey Transportation Planning Authority region we use the regional index for the New York metropolitan area and for the south Jersey region (all the other counties) we use the regional index for the Philadelphia metropolitan region.

Cross-sectional Variables

Various time-invariant features cannot be used in a cross-sectional time-series fixed effects analysis, but are used in our cross-sectional analysis. Using GIS, VTC determined the distance from the municipality centroid (geographic center) to both New York City and Philadelphia. We also calculated a variable to proxy for distance off of the Northeast Corridor. This was the $[(\text{Distance to NYC})^2 + (\text{Distance to Philadelphia})^2]^{1/2}$.

Land use/land cover data is a composite of 1995/97 land use/land cover analysis developed by NJDEP and updated for 2000 using information developed by Richard Lathrop at The Center for Remote Sensing and Spatial Analysis at Rutgers University using satellite images. From this the undeveloped land variable is derived, less acreage acquired as open space, as a percentage of total acreage as of 2000 for each municipality.

Data on tax rates, commercial and residential land values, and the ratios of assessed property values to market values are from the New Jersey Department of Community Affairs. We calculate changes between 2000 and 2008 for the cross-sectional analysis.

Various data was compiled from the 2000 US census. This included: Median number of rooms per housing unit for each municipality in 2000, average residential lot size in acres for each municipality in 2000, percentage of total housing units that were built prior to 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 of age for each municipality in 2000.

Analysis results

We analyzed the available data in three different ways. First, we examined the trends in housing prices in just the Transit Villages, comparing these to average values throughout the comparable area of New Jersey (North, Central or South). We then discuss our cross-sectional time-series analysis of data for all of New Jersey and for a sub-sample of those municipalities with rail stations. Finally, we also conduct a cross-sectional analysis which allows us to explicitly control for various time-invariant features associated with municipalities.

Graphical analysis

Some of our initial graphical results were discussed above for the six case study Transit Villages. Complete results are in Appendix 1. This is summarized in Table 3 based on the year that property values appear to diverge and the direction of that divergence. Most of the Transit Villages that saw a positive divergence in their residential equalized assessment or sale price, were located in North Jersey. Overall 8 of 20 Transit Village municipalities appear to have seen an increasing trend in residential property values, compared to the regional background trend, while 5 of the 20 had a decreasing trend. All 3 of the Transit Villages in South Jersey had a trend below the regional average. While a graphical analysis is not sufficient to draw a statistical inference, what is apparent is that the divergence in values in many cases seems to occur prior to the municipality being designated a Transit Village. This divergence suggests that it is not the designation itself that may lead to higher property values, but other factors occurring within the community. Our discussion of the six case studies suggests that one factor may be a clear commitment on the part of the community to redevelop and improve the area around the transit station.

Table 3: Transit villages and divergence in property values from average trends

Municipality	Year designated Transit Village	Year and direction of divergence apparent in graphical analysis			
		Equalized value		Average sale price	
Belmar	2003	2001	+	2002	+
Bloomfield	2003	2002	+	None	
Bound Brook	2003	None		None	
Burlington City	2007	2001	-	2002	-
Collingswood	2003	None		None	
Cranford	2003	None		None	
Elizabeth	2007	2002	+	2003	+
Jersey City	2005	2000	+	2004	+
Matawan	2003	2001	-	1998	-
Metuchen	2003	2001	-	2001	-
Morristown	1999	None		None	
Netcong	2005	None		None	
New Brunswick	2005	None		None	
Orange	2009	2005	+	None	
Pleasantville	1999	2002	-	None	
Rahway	2002	2002	+	2007	+
Riverside	2001	2001	-	2003	-
Rutherford	1999	2001	+	2005	+
South Amboy	1999	None		None	
South Orange	1999	2001	+	2001	+

+ positive divergence, - negative divergence

Our cross-sectional time-series analysis of the data attempts to examine the causal factors associated with the rise in housing values and whether the Transit Village designation played a role.

Cross-sectional time-series analysis

We initially estimate models using a simple fixed effects approach which includes dummy variables for all municipalities (less one) in the sample. This is a common approach for cross-sectional time-series data and allows one to control for unmeasured attributes by use of the fixed effects; i.e., a dummy variable for the cross-sectional units. Results are shown in Table 4 for estimates with both the equalized housing value and the average residential sale price as dependent variables. We use both dependent variables and also model the entire sample of municipalities plus only those with rail stations. The latter model helps to factor out any influence of higher housing prices from being near a rail station, as we cannot control for this other than through the fixed effects when using the full sample. We also tested whether a random effects specification might be appropriate, but the Hausman test rejected the random effects model.

Table 4: Fixed Effects Models

Dependent variable	**ln (equalized housing value, indexed)**	**ln (average residential sale value)**	**ln (equalized housing value, indexed)**	**ln (average residential sale value)**
Sample used	**All municipalities**		**Rail station municipalities**	
Lag of ln (equalized housing value, indexed)	0.652		0.603	
	(51.4)		(24.2)	
Lag of ln (average residential sale value)		0.406		0.279
		(24.6)		(8.59)
housing units (divided by1000)	0.00823	0.0300	0.00969	0.0386
	(1.88)	(4.36)	(1.31)	(3.47)
population density (divided by 1000)	0.0000658	-0.00924	-0.00494	-0.0223
	(0.011)	(-0.95)	(-0.55)	(-1.66)
Lag of total murders	-0.000606	-0.00105	-0.000727	-0.00178
	(-0.80)	(-0.88)	(-0.79)	(-1.28)
Effective tax rate	0.0157	0.0354	0.0450	0.0526
	(3.02)	(4.45)	(4.77)	(3.85)
Average ridership per station in municipality (divided by 1000)	0.00295	-0.000902	0.00212	-0.00223
	(2.17)	(-0.42)	(1.41)	(-0.99)
Total average SAT score in municipality	-0.000203	-0.000114	-0.000193	-0.0000713
	(-5.03)	(-1.78)	(-2.66)	(-0.65)
Transit Village dummy	0.0200	0.0343	0.0280	0.0515
	(1.70)	(1.86)	(2.28)	(2.79)
Constant	4.058	6.600	4.700	8.137
	(26.3)	(31.3)	(15.6)	(20.3)
Number of Observations	3735	3719	1031	1023
R^2	0.942	0.336	0.878	0.000387
δ	0.969	0.970	0.984	0.989

Year effects omitted for brevity

Two issues arise in these estimates. First, the use of a lagged dependent variable potentially leads to biased and inconsistent coefficient estimates. This is due to the lagged dependent variable potentially being correlated with the fixed effects. Another issue with this data is that the panel exhibits a high degree of serial correlation in the error term, as shown by the high value of δ. This implies that we need to correct for serial correlation as these estimates are likely inefficient. As can be seen our key variable of interest, the Transit Village dummy is statistically significant (at 90% levels and 95% levels when only rail municipalities are included in the sample). The potential bias, inconsistency, and inefficiency of the estimate can result in unreliable inferences.

Dynamic panel models are typically estimated using the Generalized Methods of Moment (GMM) estimator. We estimated the system GMM model proposed by (Arellano, Bover 1995) and (Blundell, Bond 1998) and results are shown in Table 5. This approach has the additional advantage of specifying instruments for the independent variables. This is done by using both lags and differences of the independent variables as instruments in the model. The use of instruments allows one to estimate a causal model, rather than just determining associations between the variables. GMM models, however, tend to be quite unstable and can give very different results depending on the specification of the lag structure. Our estimates assume that all lags and differences are used as instruments, rather than using ad-hoc specifications. There is one major problem with the models in Table 5. The Sargan test is used to determine the validity of the instruments used and the P=0.000 suggests that we must reject their validity as instruments. The Arellano-Bond AR2 test evaluates the correlation between the difference of the residuals, which is used to determine whether the levels are serially correlated. In our model this does not seem to be a problem and we can reject the null hypothesis of serial correlation.

The GMM approach to dynamic panel models is increasingly seen as unreliable and potentially leading to misleading results (Roodman 2009). While it solves one estimation problem, the existence of weak instruments potentially makes the overall results worse than trying to control for the bias and inconsistency of a fixed effects model with a dynamic lag. As we discuss below, the GMM model does provide more theoretically consistent results on most of the variables. We also estimated the System GMM model with the Windmeijer (2005) correction to the covariance matrix in a two-step model (Table 6). These are considered more robust, but we still have the problem of instrument validity.

With these estimation problems in mind we use a fixed effects method with a correction for serial correlation within panels. This provides estimates using the Prais-Winsten method. These results are shown in Table 7. In these models, we find that the Transit Village dummy variable exhibits a small but statistically significant effect on housing valuations, when measured by average residential sale prices, but not by equalized housing valuations. However, for both these models are R^2 value is very low, suggesting little explanation for the variance in average residential sale price.

The values of the other coefficient estimates in the model do not conform to our theoretical expectations. For example, we would expect population density to be associated with higher housing values, but we find it has a negative effect (and significant at the 95% confidence level for our rail station municipality sample). Those areas with higher population density may tend to be either higher income (e.g. parts of Jersey City along the Hudson River) or lower income (e.g. other parts of Jersey City). Increased density is a response to high land values leading to high-rise development or multi-family units, but this also partially mitigates the cost of the units.

Table 5: System Generalized Method of Moments model

Dependent variable	**ln (equalized housing value, indexed)**	**ln (average residential sale value)**	**ln (equalized housing value, indexed)**	**ln (average residential sale value)**
Sample used	**All municipalities**		**Rail station municipalities**	
Lag of ln (equalized housing value, indexed)	0.960		0.986	
	(235.1)		(218.8)	
Lag of ln (average residential sale value)		0.917		0.952
		(139.2)		(85.9)
housing units (divided by1000)	-0.000581	-0.000446	-0.000176	-0.000170
	(-2.95)	(-1.37)	(-0.68)	(-0.39)
population density (divided by 1000)	-0.0000951	0.00207	-0.000187	0.000525
	(-0.39)	(4.60)	(-0.59)	(0.93)
Lag of total murders	-0.00173	-0.00117	-0.00132	-0.000970
	(-5.78)	(-2.30)	(-3.93)	(-1.69)
Effective tax rate	-0.0422	-0.0614	-0.0122	-0.0276
	(-17.3)	(-14.6)	(-3.27)	(-4.03)
Average ridership per station in municipality (divided by 1000)	0.00129	0.000496	0.00105	0.000462
	(4.81)	(1.10)	(3.39)	(0.89)
Total average SAT score in municipality	-0.000206	-0.0000736	-0.000162	-0.0000751
	(-9.31)	(-2.16)	(-6.11)	(-1.57)
Transit Village dummy	**-0.00874**	**0.00135**	**0.00284**	**0.00386**
	(-1.40)	**(0.13)**	**(0.41)**	**(0.33)**
Constant	0.840	1.318	0.348	0.679
	(12.7)	(11.6)	(6.29)	(5.35)
Number of Observations	3735	3719	1031	1023
Sargan (p)	0.000	0.000	0.000	0.000
AB AR1 (p)	0.000	0.000	0.000	0.000
AB AR2 (p)	0.492	0.636	0.713	0.134

Year effects omitted for brevity

Table 6: System Generalized Method of Moments model with Windmeijer's finite-sample correction for the two-step covariance matrix

Dependent variable	**ln (equalized housing value, indexed)**	**ln (average residential sale value)**	**ln (equalized housing value, indexed)**	**ln (average residential sale value)**
Sample used	**All municipalities**		**Rail station municipalities**	
Lag of ln (equalized housing value, indexed)	0.960		0.987	
	(78.7)		(113.2)	
Lag of ln (average residential sale value)		0.917		0.954
		(57.5)		(35.1)
housing units (divided by1000)	-0.000590	-0.000451	-0.000164	-0.000243
	(-1.65)	(-0.92)	(-0.63)	(-0.63)
population density (divided by 1000)	-0.000110	0.00208	-0.000119	0.000752
	(-0.29)	(2.20)	(-0.32)	(0.98)
Lag of total murders	-0.00174	-0.00117	-0.00129	-0.000950
	(-3.30)	(-1.34)	(-3.10)	(-1.29)
Effective tax rate	-0.0422	-0.0612	-0.0122	-0.0279
	(-5.95)	(-5.54)	(-2.74)	(-2.20)
Average ridership per station in municipality (divided by 1000)	0.00130	0.000495	0.00101	0.000449
	(2.35)	(0.50)	(3.30)	(0.88)
Total average SAT score in municipality	-0.000207	-0.0000731	-0.000161	-0.0000796
	(-4.82)	(-1.32)	(-4.14)	(-1.15)
Transit Village dummy	**-0.00881**	**0.00119**	**0.00259**	**0.00574**
	(-1.06)	**(0.100)**	**(0.42)**	**(0.70)**
Constant	0.744	1.327	0.338	0.651
	(1.63)	(4.81)	(3.65)	(2.09)
Number of Observations	3735	3719	1031	1023
Sargan (p)	0.000	0.000	0.000	0.000
AB AR1 (p)	0.00000193	0.000	0.0236	0.000908
AB AR2 (p)	0.516	0.737	0.718	0.442

Year effects omitted for brevity

Table 7: Fixed Effects with AR1 correction

Dependent variable	**ln (equalized housing value, indexed)**	**ln (average residential sale value)**	**ln (equalized housing value, indexed)**	**ln (average residential sale value)**
Sample used	**All municipalities**		**Rail station municipalities**	
Lag of ln (equalized housing value, indexed)	0.358		0.177	
	(22.6)		(5.67)	
Lag of ln (average residential sale value)		0.0519		-0.0454
		(2.58)		(-1.22)
housing units (divided by1000)	0.0198	0.0465	0.0182	0.0490
	(2.74)	(3.92)	(1.40)	(2.74)
population density (divided by 1000)	-0.00707	-0.0227	-0.0322	-0.0515
	(-0.93)	(-1.79)	(-2.27)	(-2.60)
Lag of total murders	-0.000441	-0.00119	-0.000273	-0.00150
	(-0.57)	(-0.90)	(-0.32)	(-1.06)
Effective tax rate	0.00734	0.0211	0.0530	0.0326
	(1.13)	(1.98)	(3.73)	(1.62)
Average ridership per station in municipality (divided by 1000)	0.00369	-0.000699	0.00426	-0.000471
	(2.22)	(-0.25)	(2.12)	(-0.15)
Total average SAT score in municipality	-0.0000632	-0.0000614	-0.0000199	-0.0000742
	(-1.67)	(-0.95)	(-0.32)	(-0.69)
Transit Village dummy	**0.0117**	**0.0539**	**0.0154**	**0.0615**
	(0.74)	**(2.03)**	**(0.90)**	**(2.32)**
Constant	-0.678	10.89	9.552	12.09
	(-4.51)	(61.8)	(44.1)	(35.9)
Number of Observations	3266	3252	896	889
R^2	0.303	0.000735	0.0473	0.0147
δ	0.325	0.302	0.449	0.309
Baltagi-Wu LBI	2.095	2.108	2.127	2.090
Bhargava DW	1.725	1.738	1.725	1.739

Year effects omitted for brevity

The effective tax rate is included as we assume that higher tax rates will reduce the value of property. However, we reject this hypothesis as we actually find an opposite and significant effect. Higher tax rates appear to be associated with higher property values. A possible explanation is that those areas that accept higher taxes are areas with higher incomes and property values.

Our expectation is that a larger housing supply should decrease housing values, but this may be partly an issue of timing. We examined whether a lagged housing supply variable would provide a negative coefficient, but found that it was still positive and statistically significant. Another possible explanation is that this could be due to an increase in housing supply representing an increase in housing quality, as these would most likely be newly constructed units that may command a premium price.

To model crime we include the total murders within the municipality, lagged by one year. The reason for including total murders, rather than the murder or assault rate, is that this is more likely to affect perceptions of the desirability of a municipality. As an example, while Camden typically has a high number of murders, in some years its rate of murders and assaults is not as high as some other areas (e.g. Franklin Township in Somerset County). It is possible that in some higher crime areas such as Camden assaults are under-reported, especially as many of these are likely to be domestic assaults, while in more suburban municipalities, these are more likely to be reported. We find that our lagged total murder variable is not statistically significant.

We also estimated additional models with the lagged murder and assault rate and found this be negative and statistically significant in our residential sale model (see Table 8 and Table 9), but insignificant in the model with equalized valuations. Other variables in these models are relatively robust compared to the model in Table 7 suggesting this might be a better measure of crime than the total number of murders.

Table 8: Additional models, Fixed Effects with AR1 correction

Dependent variable	**ln (equalized housing value, indexed)**	**ln (equalized housing value, indexed)**	**ln (equalized housing value, indexed)**	**ln (equalized housing value, indexed)**
Sample used	**All municipalities**		**Rail station municipalities**	
Lag of ln (equalized housing value, indexed)	-0.380	0.363	0.694	0.185
	(-49.4)	(22.9)	(32.1)	(5.93)
Transit Village dummy	**0.0186**	**0.0118**	**0.0347**	**0.0155**
	(0.75)	**(0.75)**	**(2.79)**	**(0.91)**
housing units (divided by1000)		0.0194		0.0178
		(2.70)		(1.39)
population density (divided by 1000)		-0.00710		-0.0318
		(-0.94)		(-2.26)
Lag of assault and murder rate		0.182		0.144
		(0.96)		(0.80)
Effective tax rate		0.00751		0.0539
		(1.16)		(3.83)
Total average SAT score in municipality		-0.0000654		-0.0000247
		(-1.73)		(-0.40)
Average ridership per station in municipality (divided by 1000)		0.00358		0.00418
		(2.16)		(2.08)
Constant	15.75	-0.676	3.476	9.464
	(963.8)	(-4.44)	(14.6)	(43.4)
Number of Observations	5595	3265	1064	896
R^2	0.560	0.316	0.989	0.0477
δ	0.814	0.321	0.0294	0.442
Baltagi-Wu LBI	2.093	2.101	2.160	2.145
Bhargava DW	1.412	1.731	1.959	1.741

Year effects omitted for brevity

Table 9: Additional models, Fixed Effects with AR1 correction

Dependent variable	**ln (average residential sale value)**	**ln (average residential sale value)**	**ln (average residential sale value)**	**ln (average residential sale value)**
Sample used	**All municipalities**		**Rail station municipalities**	
Lag of ln (average residential sale value)	0.596	0.0363	0.421	-0.0503
	(59.2)	(1.81)	(14.1)	(-1.36)
Transit Village dummy	**0.0362**	**0.0525**	**0.0591**	**0.0609**
	(2.63)	**(1.97)**	**(1.81)**	**(2.30)**
housing units (divided by1000)		0.0448		0.0445
		(3.72)		(2.51)
population density (divided by 1000)		-0.0243		-0.0539
		(-1.90)		(-2.71)
Lag of assault and murder rate		-11.06		-15.78
		(-5.30)		(-2.85)
Effective tax rate		0.0189		0.0333
		(1.76)		(1.65)
Total average SAT score in municipality		-0.0000521		-0.0000662
		(-0.81)		(-0.62)
Average ridership per station in municipality (divided by 1000)		-0.000914		-0.000691
		(-0.33)		(-0.22)
Constant	4.480	11.10	6.737	12.25
	(39.7)	(64.5)	(39.3)	(0.21)
Number of Observations	7213	3251	1087	889
R^2	0.932	0.000503	0.923	0.0445
δ	-0.00816	0.318	0.507	0.316
Baltagi-Wu LBI	2.199	2.100	2.172	2.091
Bhargava DW	2.007	1.728	1.866	1.736

Year effects omitted for brevity

The school quality variable, the total SAT scores for the municipality, is in most cases statistically insignificant; and in some models actually negative and with a small level of statistical significance. This is unexpected as we hypothesized that better school quality would increase housing values.

The average station ridership by municipality is statistically significant in our equalized housing value models (see Table 7 and Table 9), but not when our dependent variable is the average residential sale price.

As mentioned previously, each Table also includes models that have only municipalities with rail stations. This was done as it is possible that the Transit Village dummy was simply picking up the effect of having a rail station, rather than the effect of the Transit Village program. We could not control for the presence of a rail station as for most municipalities there was no change over the time series in the number of stations (minor changes did occur, in particular the opening of the RiverLine in 2004 and some extensions to the Hudson-Bergen Light Rail). Overall, we do not find major differences in the estimate for our Transit Village dummy variable. The model with AR1 corrections (Table 7) is very robust with the average residential sale price model having similar parameter values on the transit dummy variable, despite the different and smaller size of the sample with rail stations.

To further test for the robustness of our result, we estimate models that omit some variables in Table 8 (for the equalized housing value) and Table 9 (for the average residential sale price). These are estimated using the fixed effects model with a correction for autocorrelation. First we omit all other variables and include just the Transit Village dummy and year fixed effects. We find that the Transit Village dummy is statistically significant when the average residential sale price is used as the dependent variable (Table 9); at the 95% confidence level when all municipalities are included and 90% when only rail station municipalities are included. For the equalized housing valuation model we find that the Transit Village dummy is only statistically significant in the model with just rail station municipalities (Table 8).

These results suggest that there is some association between being designated as a Transit Village and having higher residential property values. Our graphical analysis also supports this conclusion. However as the discussion above has shown, when additional covariates are included in the model, this effect is less apparent, and we are unable to determine whether there is a causal effect. Our preferred model is the fixed effects model with a correction for autocorrelation, and while these tend to show a significant effect for the Transit Village dummy, when the average residential sale price is used, the R^2 values drop substantially, suggesting that the overall fit of the model is not good.

Cross-sectional analysis

As an alternative to the cross-sectional time-series analyses performed above, more traditional cross-sectional analyses were performed as well. This meant that the dependent variable was the change in residential property sales prices rather than the price itself. But the object of the analysis was similar—to find out if property-price changes between 2000 and 2008 have been stronger in New Jersey's Transit Villages (as identified in 2008) than they have been elsewhere within the state, *ceteris paribus*. The main difference is that only one observation exists per municipality, rather than one for each year of the study. Hence, factors absorbed as fixed effects in the panel analyses are articulated, insofar as possible. This meant that details were needed on each municipality's typical property characteristics: the quality and quantity of its residential structure(s) and the 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***.

Because the object of the analysis is identifying the determinants of property price changes, the property and municipal characteristics should be evaluated both as a function of their initial state (in the year 2000) as well as a function of the change in the quantity/intensity and price of the characteristics

between 2000 and 2008. For example, the magnitude of a particular property's price changes is a function of its initial price, the extent of investments that the owner has put into the property, and the change in tastes of consumers for existing housing attributes (which affects the relative price of the attributes). As in the case of the panel analysis above a log-linear functional form was applied as has been suggested by (Cropper, L. Deck & KE 1988). As a result, the basic model applied was that shown below, where the notation detailed above includes both the state and change version of the characteristics.

In the case of the analysis presented here ***q*** consisted of the municipality's average number of rooms per unit, average residential parcel size, percent of residential stock in 2000 that was built prior to 1960, the share of the housing stock that was composed of seasonal units, and the municipality's overall density of housing units. The vector of ***n*** demographic characteristics consisted of shares of total population in 2000 composed of minorities (Black, Hispanic, and Asian), population density in 2000, the poverty rate in 1999, and the percent of the population that was school-aged in 2000. Vector ***m*** was composed of the distance between the municipality and Downtown Manhattan (distances to Center City Philadelphia are highly correlated), and distance to the central city of the closest New Jersey metropolitan area (Vineland, Atlantic City, Camden, Trenton, New Brunswick, Newark, and Jersey City). With regard to public services, ***s***, it was theorized that variations in school quality likely affected home prices most. Hence the focus was on scores on statewide exams: the share of area junior high students that demonstrated proficiency on the ASK4 Math Test in 2000 and the local high schools' average SAT scores in 2001. But municipal interest in historic preservation both through district designation and application to be a certified local government were also controlled for. Since the math and verbal scores were highly correlated, only the verbal aspect of the score was chosen. With regard to the residential tax burden, ***t***, the local property tax rate in 2000 and the share of municipal revenues received from the state in 1990. Finally the change in housing density for the 2000-2008 period and share of municipal land that was undeveloped in 2000 were applied to control for the local intensity of housing demand (***d***) during the period.

The cross-sectional residential price change was modeled in four configurations. First, we applied equalized assessed values that were price adjusted separately to reflect the very high market segmentation between the northern and southern parts of the state. We investigated the basic model using average residential property sales prices. Special criteria were used by the state when designating municipalities as Transit Villages. Because of this, some possibility exists that the Transit Village variable embodies the essence of the selection criteria rather than the Transit Village status itself. If so, then the statistical problem of endogeneity arises in both of the above models. In an attempt to correct for this issue, we also attempted to instrument for the Transit Village variable. We noticed that Transit Village designation tended to occur in fairly densely populated municipalities that seemed to be fairly savvy with respect to town planning. Hence, we used as instruments for the Transit Village variable the log of municipality population density and the municipality decision to establish its own ordinance for historic preservation.

As can be seen in Table 10, Table 11, and Table 12, only the model that showed Transit Villages might have a statistically significant effect on residential property values was that for equalized assessed property values without instruments. According to the results of this model, New Jersey's Transit Villages had an appreciable effect between 2000 and 2008. In the alternative models (the instrumented version of the average home price sales model is not displayed in this report), the Transit Village variable is not at all close to being statistically significant. The instrumental variable regression provides a good

Sargan test suggesting the model is not overidentified, but the instruments remain weak, which can cause estimation problems.

We focus our examination of results for control variables upon those in Table 10, which displays the most positive results for New Jersey's Transit Villages. With regard to housing attributes ***q***, we note that a greater share of seasonal housing units tended to improve rates of appreciation in New Jersey and that more rooms per unit, larger shares of older housing stock, and larger than average parcel sizes tended to dampen the ability of residential properties to appreciate during the study period in New Jersey. Municipalities with higher housing unit densities also yielded higher appreciation rates. Of these, only the value-dampening effect of larger parcel sizes appears somewhat perverse. Of course, this variable could also proxy for suburban locations in close proximity to the state's central cities.

For neighborhood attributes ***n***, the municipality poverty rate and share of population that is school-aged had positive effects. But a high share of population with minority status, presence of a national historic district, and population density had deleterious effects on appreciation rates. Of these, the dampening effect of a national historic district was unexpected given findings from many studies of residences outside of New Jersey using 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. While a positive effect of low poverty rates might be somewhat unexpected, it undoubtedly is displaying a convergence effect: that is, the parameter for poverty rates, rather than that for low property values, shows that properties with lower values tend to appreciate percentagewise more rapidly than do properties with higher values.

Table 10: Log-Linear regression of the determinants of change in the indexed average equalized property value for New Jersey municipalities between 2000 and 2008

	Coefficient	**t-test**
Constant	0.70466*	(2.28)
2008 Transit Village	**0.07312***	**(2.41)**
Average equalized assessed property value in 2000	0.01161	(0.81)
Distance to New York	-0.00197	(-1.77)
Square of the Distance to New York	0.00002*	(2.30)
Log of the sum of squared distances to both New York and Philadelphia	-0.12363**	(-2.93)
Log of the Distance to the closest CBD	0.04786***	(3.85)
% of 2000 population school-aged	0.00666***	(4.13)
% of 2000 housing stock seasonal	0.00432***	(8.43)
Rooms per unit 2000	-0.0075	(-0.86)
Density of residential units 2000	0.00002**	(2.87)
Change in unit density 2000-2008	-0.00003	(-0.43)
Log of housing density 2000	0.03100**	(2.66)
Average residential parcel size in 2000	-0.04662**	(-3.00)
% of homes in 2000 built before 1960	-0.00163***	(-4.60)
Percent of land area undeveloped in 2000	0.00102	(1.94)
% of revenues from state in 1990	-0.00553***	(-3.32)
Tax rate in 2000	-0.00259	(-0.70)
Tax rate 2008/tax rate 2000	-0.00988**	(-3.18)
Verbal SAT score in 2001	-0.00076***	(-3.65)
Change in average Verbal SAT score 2001-2008	-0.00068	(-1.93)
% of student proficient in the ASK4 math test in 2000	0.00155	(1.65)
Change in % ASK4 math test proficiency 2000-2008	0.00023	(0.34)
Presence of Path station	0.18648**	(2.73)
Presence of PATCO station	0.02031	(0.37)
Presence of NJ Transit commuter rail station	-0.00603	(-0.41)
Presence of a historic district	-0.07771**	(-2.99)
A Certified Local Government	0.08184*	(2.54)
Population density^2	0	(-1.96)
% of population Black in 2000	-0.11731	(-1.87)
% of population Asian in 2000	-0.25567	(-1.88)
% of population Hispanic/Latino in 2000	0.10982	(1.32)
Poverty rate in 1999	0.00344*	(2.05)
R^2	0.473	
N	514	

The market variables ***m*** show more agreement with expectations. Homes further from old urban cores tended to appreciate more. Being away from the main New York-Philadelphia corridor also was associated with lower appreciation rates as well. Still, homes closer to New York City did not appreciate as quickly as those further from it. Finally, municipalities with a PATH station tended to have higher than expected appreciation rates, even after omitting Jersey City from the analysis. But those with a PATCO or NJ Transit commuter rail station had appreciation rates that were not superior to those without them, after controlling for all other cross-sectional variables.

Public services ***s*** was strictly measured in the form of education—SAT verbal scores and math proficiency in junior high schools. Junior high school math proficiency had no statistically significant bearing on appreciation rates. But area municipalities with students who attained higher than average SAT verbal scores tended to have properties that did not appreciate very rapidly. Like poverty rates, this latter effect may also be one of convergence since SAT scores are perhaps the single-best known measure of school quality as perceived by homeowners and they are fairly stable over time. Hence, places with higher than average SAT scores tend to have higher property values to begin with. This may also explains the lack of statistical significance for this variable in the cross-sectional time-series analysis.

Tax burden ***t*** results met expectations. Municipalities with relatively high and rapidly rising tax rates tended to have home values that rose less quickly. Also municipalities that were able to secure large shares of funding from the state—those that tended to have relatively poor tax bases—tended to grow more slowly.

Finally demand-based pressures ***d***, tended to show no effect at all. That is, the share of land in the municipality that was undeveloped and the change in housing unit density had no systematic effect at all on residential appreciation rates in New Jersey from 2000-2008.

In sum the cross-sectional analysis reveals some evidence that if there is an association between Transit Village designation and residential property values, and it is a positive one. Still, this finding is not robust to the use of more sophisticated statistical approaches or to the use of residential property sales prices, as opposed to indexed equalized assessed values (although the former gave better results in our cross-sectional time-series analysis). The overall implication is that, while residential properties in New Jersey's Transit Villages may have appreciated more than they did elsewhere in the state, the rises may have been due to characteristics of the transit-village municipalities prior to the actual designation. That is, the density of the municipalities and the forward-looking character of their policymakers that enabled their designation as Transit Villages may well have been the root cause of any growth in home prices that might be observed, rather than the privilege and rewards of designation itself.

Table 11: Log-Linear regression of the determinants of change in the indexed average equalized property value for New Jersey municipalities between 2000 and 2008 (with Transit Village binary variable instrumented)

	Coefficient	**t-test**
Constant	1.14942*	(2.42)
2008 Transit Village	**-0.36334**	**(-1.18)**
Average equalized assessed property value in 2000	-0.00187	(-0.10)
Distance to New York	-0.00273	(-1.96)
Square of the Distance to New York	0.00003*	(2.36)
Log of the sum of squared distances to both New York and Philadelphia	-0.17216**	(-2.89)
Log of the Distance to the closest CBD	0.05453***	(3.61)
% of 2000 population school-aged	0.00811***	(3.82)
% of 2000 housing stock seasonal	0.00460***	(7.36)
Rooms per unit 2000	-0.00755	(-0.75)
Density of residential units 2000	0.00002	(1.67)
Change in unit density 2000-2008	0.00004	(0.38)
Log of housing density 2000	0.02837*	(2.09)
Average residential parcel size in 2000	-0.04093*	(-2.22)
% of homes in 2000 built before 1960	-0.00107	(-1.88)
Percent of land area undeveloped in 2000	0.00071	(1.10)
% of revenues from state in 1990	-0.00537**	(-2.79)
Tax rate in 2000	-0.00431	(-0.96)
Tax rate 2008/tax rate 2000	-0.00731	(-1.82)
Verbal SAT score in 2001	-0.00103***	(-3.35)
Change in average Verbal SAT score 2001-2008	-0.00061	(-1.48)
% of student proficient in ASK4 math test in 2000	0.00206	(1.80)
Change in % ASK4 math test proficiency 2000-2008	0.0003	(0.39)
Presence of Path station	0.25323**	(2.76)
Presence of PATCO station	0.08569	(1.10)
Presence of NJ Transit commuter rail station	0.03547	(1.05)
Presence of a historic district	-0.05301	(-1.53)
A Certified Local Government	0.05433	(1.29)
Population density^2	0	(-1.84)
% of population Black in 2000	-0.09136	(-1.22)
% of population Asian in 2000	-0.24089	(-1.53)
% of population Hispanic/Latino in 2000	0.09701	(1.01)
Poverty rate in 1999	0.00437*	(2.13)
R^2	0.246	
N	514	
Sargan test	0.603	

Table 12: Log-Linear regression of the determinants of change in average residential property sales price for New Jersey municipalities between 2000 and 2008

	Coefficient	**t-test**
Constant	5.97434***	(5.96)
2008 Transit Village	**0.047**	**(0.54)**
Average property price in 20000	-0.46385***	(-7.61)
Log of the Distance to New York	-0.18277***	(-4.27)
Log of the sum of squared distances to both New York and Philadelphia	0.04794	(0.52)
Log of the Distance to the closest CBD	0.19552***	(5.18)
% of 2000 population school-aged	0.00173	(0.36)
% of 2000 housing stock seasonal	-0.00233	(-1.06)
Rooms per unit 2000	0.02642	(0.99)
Density of residential units 2000	-0.00003	(-1.54)
Change in unit density 2000-2008	0.00040*	(2.02)
Log of housing density 2000	0.06278	(1.76)
Average residential parcel size in 2000	0.05006	(1.07)
% of homes in 2000 built before 1960	-0.00200*	(-1.97)
Percent of land area undeveloped	-0.00106	(-0.72)
% of revenues from state in 1990	-0.00639	(-1.25)
Tax rate in 2000	-0.00556	(-0.52)
Tax rate 2008/tax rate 2000	-0.01722	(-1.93)
Verbal SAT score in 2001	-0.00054	(-0.85)
Change in average Verbal SAT score 2001-2008	-0.00206*	(-1.97)
% of student proficient in ASK$ math test 2000	-0.00008	(-0.03)
Change in % ASK4 math test proficiency 2000-2008	-0.00437*	(-2.25)
Presence of Path station	0.08102	(0.41)
Presence of PATCO station	0.07201	(0.46)
Presence of NJ Transit commuter rail station	-0.05077	(-1.19)
Presence of a historic district	-0.18435*	(-2.49)
A Certified Local Government	0.24786**	(2.67)
Population density^2	0	(0.25)
% of population Black in 2000	-0.30543	(-1.70)
% of population Asian in 2000	-0.29431	(-0.75)
% of population Hispanic/Latino in 2000	0.2784	(1.16)
Poverty rate in 1999	0.00104	(0.21)
R^2	0.262	
N	505	

Summary and Conclusions of Residential Analysis

Our analyses of residential property values find some evidence of an association between Transit Village designation and increases in property values. While our original intent was to develop a causal model, using an instrumental variable or GMM approach, we found that it was not possible to find a suitable instrument to represent the designation of a Transit Village. It is possible that this is not an endogenous effect; that is, the designation may be exogenous to the value of property, but we cannot say for sure. We find statistically significant associations in some of the cross-sectional time-series models, as well as our cross-sectional analysis, but our instrumental variable and GMM models fail to provide good instruments. Our graphical analysis suggests that in some Transit Villages there is a divergence in property values, although not necessarily linked to when the municipality became a Transit Village. Our case studies also suggest a wide variation in what the Transit Villages have accomplished in terms of development. There is some evidence that those municipalities that have taken steps to encourage transit-oriented development, either through pro-active planning, or professional capabilities, have seen increases in the value of residential properties. Being designated a Transit Village may be simply an indicator of how these municipalities are able to take advantage of opportunities provided by the state.

Evaluation of Commercial Real Estate Prices

The New Jersey Transit Village program could potentially have some impact on encouraging more commercial development near designated transit stations. In theory we would expect any development plans would seek to cluster retail and office establishments near transit stations. The increase in housing that would be associated with a Transit Village would provide increased demand, mainly for retail activities, thus we would expect retail rents to increase and retail activity to potentially increase. While office development may increase, rental rates might not be expected to increase as the competition for office locations is likely affected by regional accessibility patterns, including the mobility offered by existing road networks. Likewise for industrial rental rates, which we do not expect to show any pattern of increase associated with Transit Villages.

Our site visits demonstrated a variety of activities around the six Transit Villages that we visited. New developments tended to mix residential and retail uses, in line with what one would expect in a transit-oriented development, while some, such as Bound Brook basically had none. Some office development may have been present, but not on a large scale. This may be due to the nature of those Transit Villages that were visited. Journal Square is the one exception, where there clearly were some developments that would serve office development, with additional planned.

Data

To analyze these issues we obtained data from CoStar, which tracks commercial real estate rents, supply, vacancy, and other information for geo-coded locations. We were able to obtain quarterly time-series commercial real estate data surrounding all the 19 Transit Village sites plus a selection of 23 control sites based upon the same rail line (or in the case of Pleasantville, a comparable location). We collected quarterly data from between 1999 and 2008. Ideally we would want to measure commercial rents as close to the transit station as possible, normally within one-quarter mile which is a typical walking distance. Unfortunately the CoStar database access system only allowed us to extract a minimum radius around the station of one mile. We therefore extracted data for both one mile and three mile radiuses around each station, allowing us to examine distance effects. Retail, office (class A), and industrial rents were extracted, allowing us to examine the effect of a Transit Village designation on each category of commercial property at both one mile and three mile distances. We also do not have

information on the quarter that the Transit Village designation occurred, so we set our indicator variable based on the entire year.

The Transit Village stations for which data were extracted are listed in Table 1 and the comparison sites inTable 13. The municipality in which they are located, the county, the year the area became a Transit Village, and the rail line of the station (with the exception of Pleasantville which is a bus depot, and Manahawkin which is the comparison site). We do not have complete data for all years. The retail data is particularly sparse prior to 2004 and thus we have analyzed this data without these earlier years. Office and industrial data is generally more complete for all years, however for industrial data there are some stations with no records within 1 mile (Manahawkin, Oradell, Ramsey, and Watchung Ave). The dataset also contains information on the rentable building area, and we have a near complete time series for this variable.

Additional data was obtained on the capacity of the road network, which has been found to be an important determinant of commercial property values, especially office developments, in other studies (Ryan 2005). The only time-series data available is by county, thus we include the density of freeways and turnpike mileage as a proxy to represent road accessibility based on the county in which the transit station is located. We also investigate the impact of crime in the municipality, using data on aggravated assaults per capita within the municipality, so not directly linked to the immediate neighbourhood of the Transit Village. We would potentially expect this to be associated with reduced rental rates, especially for retail establishments. All rental rates were adjusted for inflation using the quarterly GDP deflator for structures.

Analysis Methods

Our initial analysis consisted of a graphical examination of the trends in the data. We examined the trend in rental rates, by type of property, and the distance radius around the transit station. These were plotted for each rail line to allow a visual examination of whether there are any underlying trends in the real rental rates that might be different for those stations that are Transit Villages. See Appendix 2 for these graphs.

What is clear from examining the data graphically is that it is both very messy and that no clear underlying patterns can be found to discern differences between those areas designated as Transit Villages and those that are not. This analysis also revealed various gaps in the dataset, but in many cases there is near complete time series data for many of the stations (for retail only after 2004).

Our next step was to conduct a statistical analysis of the data to determine whether we can find any statistically significant association between the Transit Village designation and rental rates. Our underlying hypothesis is that those areas designated as Transit Villages will see higher rental rates. To test this we specify the following model,

Where *Y* represents the rental rate for a given station, *i*, at a given time period, *t*, and T is a categorical variable with the value *1* if station *i* is a Transit Village in time period *t,* and *X* represents other control variables, namely the supply of rental building area, the density of freeway and turnpike mileage in the county, the aggravated assault rate of the municipality. The error term is and is the fixed effect term, essentially a dummy variable for each cross-sectional unit, allowing us to capture time-invariant unmeasurable factors associated with each station. A time trend, *q*, is also included in the analysis to capture constant changes over time. The parameters are represented by β, γ, and δ. The model is specified as a logarithmic model (except for the time trend and dummy variables). This is done to minimize any heteroskedasticity by reducing large variations in the data and we also found that this

gave the best fit to the data. We also do not specify this model dynamically, as we expect rental rates to be independent within a given year. Twelve models are estimated, two for each type of commercial property, one for both one mile and three mile radiuses around the station, and with two different estimation methods.

Table 13: Comparable stations along same rail line

Station	County	Municipality	Rail line
Asbury Park	Monmouth	Asbury Park	NJ Coast Line
Berkeley Heights	Union	Berkeley Heights	Raritan Valley Line
Boonton	Morris	Boonton	Montclair Boonton Line
Chatham	Morris	Chatham	Morristown Line
Cinnaminson	Burlington	Cinnaminson	RiverLine
Dover	Morris	Dover	Morristown Line
Dunellen	Middlesex	Dunellen	Raritan Valley Line
Edison	Middlesex	Edison	Northeast Corridor
Garfield	Bergen	Garfield	Main Bergen County Line
Glen Ridge	Essex	Glen Ridge	Montclair Boonton Line
Grove St	Hudson	Jersey City	Newark Light Rail
Linden	Union	Linden	Northeast Corridor
Lyndhurst	Bergen	Lyndhurst	Main Bergen Co Line
Manahawkin	Ocean	Manahawkin	Comparison for Pleasantville
Oradell	Bergen	Oradell	Pascack Valley Line
Perth Amboy	Middlesex	Perth Amboy	NJ Coast Line
Plainfield	Union	Plainfield	Raritan Valley Line
Ramsey	Bergen	Ramsey	Main Bergen County Line
Red Bank	Monmouth	Red Bank	NJ Coast Line
Somerville	Somerset	Somerville	Raritan Valley Line
Teterboro	Bergen	Teterboro	Pascack Valley Line
Watchung Ave	Essex	Montclair	Montclair Boonton Line
Westfield	Union	Westfield	Raritan Valley Line

One issue with this model is that it will only determine an association between the Transit Village indicator and the rental rates. It is possible that the designation of a Transit Village is dependent on various underlying factors associated with a given station, that is, the designation itself could be endogenous to the changes in rental rates. To control for this we estimate a two-stage least squares instrumental variable model, that uses a one period lag of the rental rate as the instrument for the Transit Village variable in addition to a fixed effects model.

Results of Analysis

Results are shown in the following tables for retail rental rates (Table 14), office rental rates (Table 15) and industrial rental rates (Table 16). Separate models are estimated for the 1 mile radius and 3 mile

radius rings around the transit stations in our data. Both a simple fixed effects model and and an instrumental variable model (to control for endogeneity) are estimated.

The data used for the retail models (Table 14) begins in 2004 up to 2009, thus the number of observations in the data are less than in the analyses of the other sectors. Models were also run with all the data, and results were not substantively different. Our key variable of interest is the Transit Village dummy which we find to be statistically insignificant, suggesting that retail rental rates were not affected either negatively or positively when a Transit Village was established. This is shown by the t-test (z-test in the IV models) that is below the standard level of statistical significance of a 95% confidence level of 1.96. The models also do not fully explain the variation in rental rates, as the R^2 for the fixed effects models are low (0.089 and 0.083). The instrumental variables models suggest that all coefficients are not significantly different than zero as the F test for the model was not significant. Also, the Sargan test suggests that instruments are weak, thus we are unable to make any reasonable inferences from these two models.

Table 14: Models with Retail Rental Rates

Log (Real rental rate)	**Retail - 1 mile**		**Retail - 3 mile**	
	FE	IV	FE	IV
Transit village dummy	**0.028 (0.37)**	**27.202 (0.97)**	**-0.01 (-0.21)**	**-20.688 (-0.97)**
Quarter	-0.016 (-7.51)	1.92 (0.55)	-0.011 (-7.76)	-05.992 (-0.70)
Log (Freeway density)	0.901 (0.86)	-0.182 (-1.04)	-0.831 (-1.81)	0.156 (0.89)
Log (Rentable building area)	0.807 (3.81)	-51.578 (-0.90)	0.121 (0.37)	-06.829 (-0.69)
Log (Assault rate)	0. (-0.02)	0.506 (0.74)	0.024 (1.46)	0.202 (0.61)
Constant	-06.005 (-1.94)		0.459 (0.09)	
N	563	524	801	784
R^2	0.089		0.083	
Sargan test		0.000		0.000

t/z-stats in parentheses

Our analysis of office rental rates provide some more interesting results, however, we cannot say with certainty which of the models provides the best results. Our initial expectation was that those areas designated as Transit Villages would see an increase in their office rental rates. Our results actually suggest that there is a negative effect. As can be seen in Table 15, the Transit Village dummy is negative and statistically significant for both the fixed effect and instrumental variable models for the 1 mile radius. This might suggest that the increased access that Transit Villages facilitate (depending on the housing development that occurs) might actually shift jobs and office development to Manhattan and Newark which would tend to have higher paying jobs. This seems like a plausible hypothesis and our data do not clearly reject this. Further support can be seen by the fact that for the 3 mile radius the Transit Village dummy is not statistically significant.

Other features of the model include a much better statistical fit for both the fixed effects models. Both instrumental variable models again suffer from weak instruments, which make their results unreliable. Other results include a downward trend in rental rates (significant in the FE models), some effect of freeway density associated with decreased rental rates in the 3-mile radius, but increased rental rates in the IV model for 1-mile radius. We would expect increases in rentable building area to reduce rental rates and the models show inconsistent results for this variable. The results for assault rates are positive and significant in the fixed effects model, which is contrary to our theoretical expectation that this

would have a negative effect on rental rates. The office models fixed effects model actually give the best overall fit of all the models estimated with a R^2 value of 0.319 and 0.267.

Table 15: Models with Office Rental Rates

Log (Real rental rate)	**Office - 1 mile**		**Office - 3 mile**	
	FE	IV	FE	IV
Transit village dummy	-0.068 (-3.26)	-06.681 (-3.35)	-0.017 (-1.47)	-15.422 (-0.99)
Quarter	-0.011 (-22.18)	-01.065 (-1.32)	-0.013 (-46.46)	-11.332 (-0.95)
Log (Freeway density)	-0.109 (-1.70)	0.061 (2.77)	-0.081 (-2.47)	0.168 (0.91)
Log (Rentable building area)	0.117 (1.45)	-03.702 (-3.03)	0.206 (3.27)	-09.266 (-0.99)
Log (Assault rate)	0.021 (1.90)	-0.137 (-1.26)	0.034 (5.78)	-0.577 (-0.88)
Constant	1.842 (1.71)		0.574 (0.61)	
N	1383	1347	1640	1638
R^2	0.319		0.267	
Sargan test		0.000		0.000

t/z-stats in parentheses

Table 16: Models with Industrial Rental Rates

Log (Real rental rate)	**Industrial - 1 mile**		**Industrial - 3 mile**	
	FE	IV	FE	IV
Transit village dummy	0.023 (0.52)	72.995 (0.49)	-0.018 (-1.16)	-13.89 (10.504)
Quarter	-0.005 (-5.15)	71.772 (0.49)	-0.01 (-24.97)	-07.568 (6.553)
Log (Freeway density)	-0.361 (-3.06)	-0.737 (-0.49)	0.132 (2.71)	0.15 (0.122)
Log (Rentable building area)	0.133 (0.700)	11.823 (0.46)	-0.162 (-1.09)	-08.794 (6.839)
Log (Assault rate)	-0.023 (-0.97)	3.591 (0.48)	0.004 (0.500)	-0.495 (0.428)
Constant	-0.613 (-0.22)		4.909 (2.06)	
N	998	946	1570	1557
R^2	0.021		0.179	
Sargan test		0.000		0.000

t/z-stats in parentheses

Our initial expectation was that a Transit Village designation would not have any impact on industrial rental rates (Table 16). This is largely shown by the lack of statistical significance in the FE model for the 1 mile radius. The IV model again has weak instruments and we cannot draw any conclusions from this. We have more confidence in the FE models as we would not expect much any endogenous effect on industrial rental rates. Looking at these models for the 1 mile and 3 mile radius the most interesting result is the effect of freeway density. This diminishes rents near a transit station but increases rents at a greater distance. This is not surprising as we would expect more demand for industrial rental space outside the immediate area near a transit station and with better access to road facilities. The 3 mile radius model also has a reasonable R^2 of 0.179, suggesting a moderately overall good fit to the model.

Summary and Conclusions of Commercial Analysis

There are many limitations to our analysis of commercial data that require cautious interpretation of these results. First, the ability to isolate properties located within a close walking distance of the transit station makes it difficult to clearly attribute changes occurring with a 1-mile radius to changes associated in the immediate environs of a station. Ideally it would be desirable to examine the rental rates within a quarter-mile of the station as we expect walking activity around the station to be one of the attractors of increased demand for commercial space, and consequent increases in rental rates, but as previously indicated this data was not available for our study.

The second difficulty is that our analysis results suggest that there are many missing factors that our regressions cannot adequately control for. In essence, as shown by the graphical analysis, the data is very messy, and we are uncertain whether this is due to data collection error or other idiosyncracies of the dataset. The lack of a longer time-series for the retail data also makes it difficult to pick up any statistical association between Transit Village designations and rental rates. Our best model is for the office rental rates within 1 mile of the station. This shows a negative association with Transit Village designation, which appears plausible if we consider the competitive effects of increased access to higher paying jobs afforded by the Transit Village. Not surprisingly we can pick up no statistical association with industrial rental rates, but the models are still relatively weak. And finally, we can say nothing about causality given the weakness of the instruments in our IV models.

Thus, our overall conclusion is that retail and industrial rental rates do not appear to have been affected either positively or negatively from the designation of a Transit Village. Our case studies to some extent support this result, as while there was some development activity at the six transit stations investigated, it was not consistent; our graphical analysis also did not reveal any clear pattern. We cannot reject the hypothesis that office rental rates have a negative association with Transit Village designation, but this conclusion requires additional more detailed investigation.

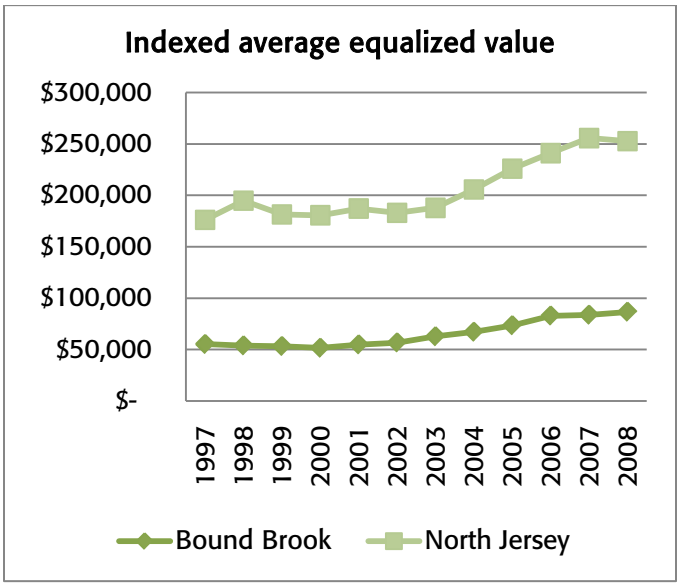
Overall Summary of Results

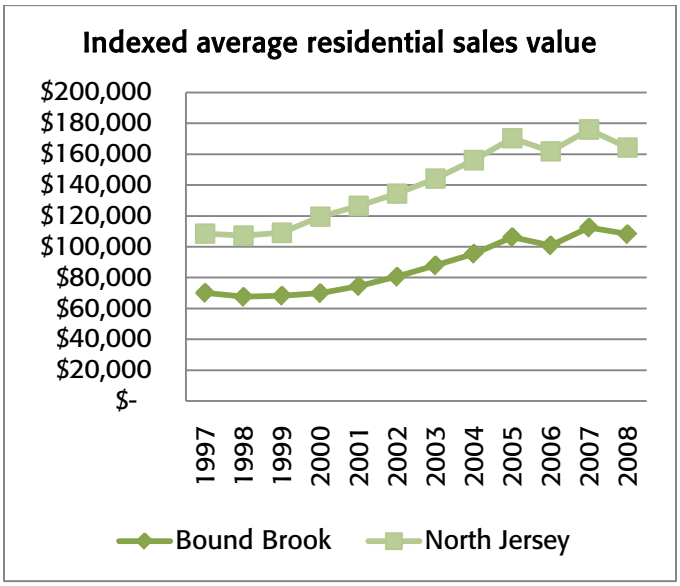
Our findings suggest that there are some associations between being designated a Transit Village and higher residential property values. We find no effect for most commercial property and potentially a negative effect for office rental rates. Many of the models analyzed suffer from various data and statistical problems and for this reason we are not overly confident in many of our modelling results. This is especially true for the commercial rental rate analysis where the dataset did not allow us to link development to the walking distance from the transit station. Despite these caveats, we do find a statistically significant association for residential property values, and our cross-sectional analysis is relatively robust at showing an association between being a Transit Village and an increase in residential property values.

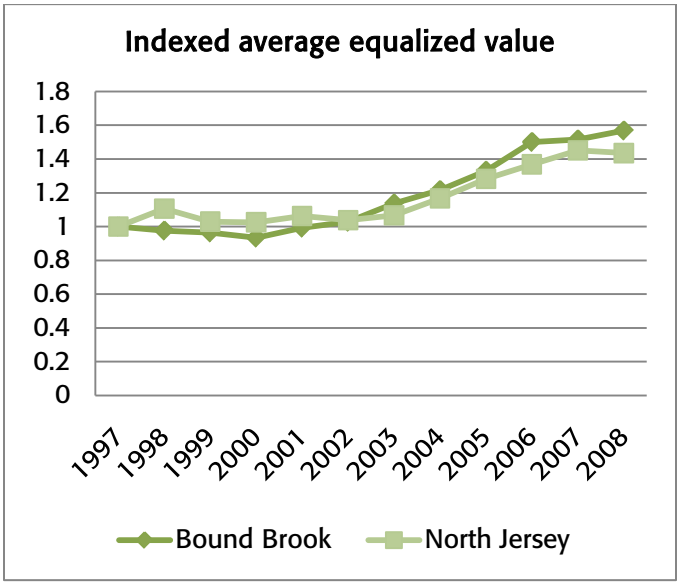
Our case studies and graphical analysis, suggest that there have been some real changes spurred by the Transit Village program, but that many of these are likely due to strong political commitment and good planning within selected communities. Being designated a Transit Village is symptomatic of having a professional staff aware of this type of opportunity offered by the state. Thus, to some extent, what our analysis likely shows is that the commitment of a municipality to improving and developing the area around a Transit Village can increase demand for properties in that municipality. The increased tax revenue is clearly a benefit for the municipality as is the improved aesthetics and amenities associated with transit-oriented development.

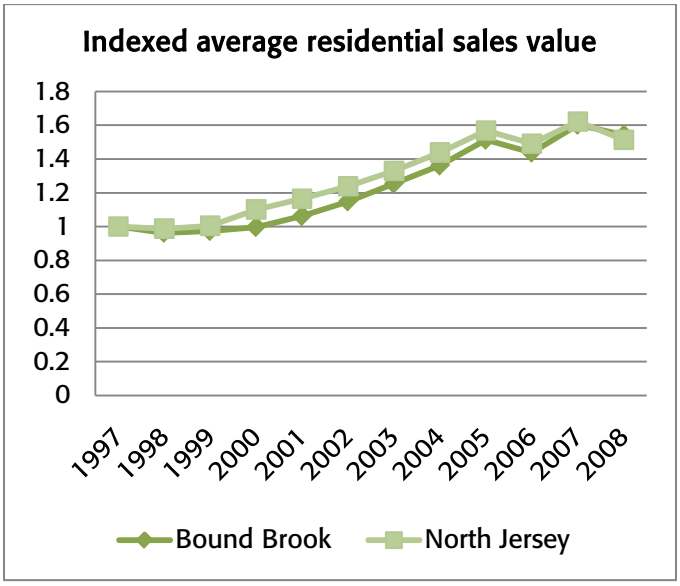
Appendix A: Graphical Depiction of Changes in Housing Values

Bound Brook Transit Village vs. North Jersey Counties
(Bergen, Essex, Hudson, Morris, Passaic, Somerset, Sussex, Union & Warren Counties)

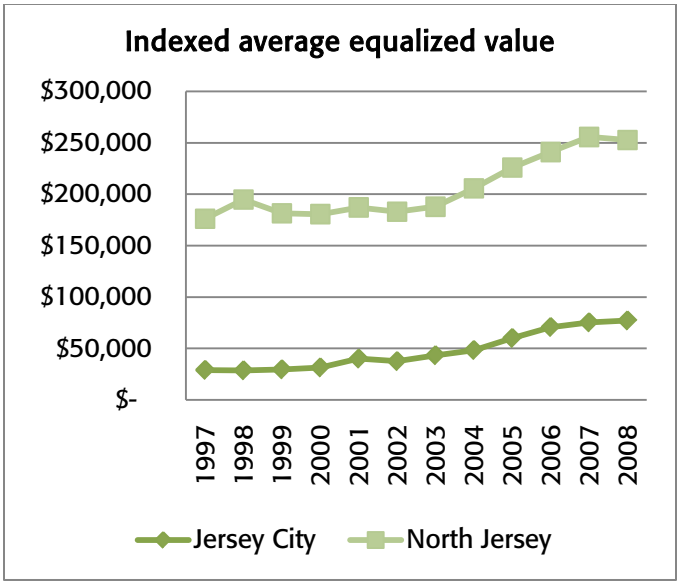


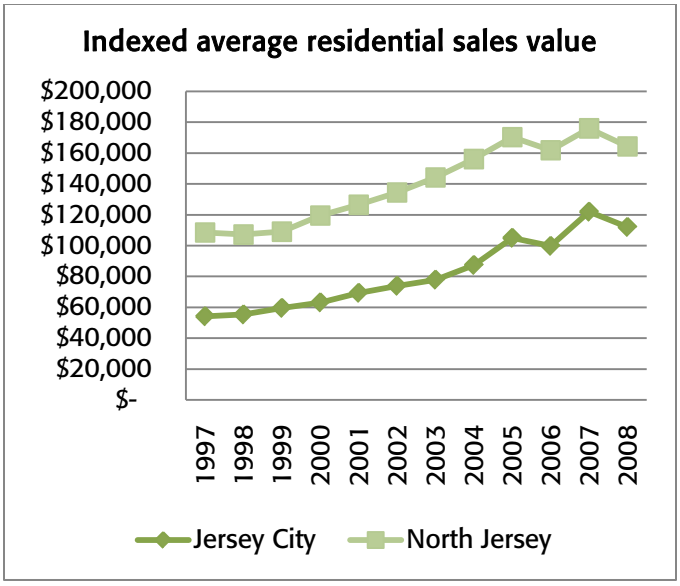


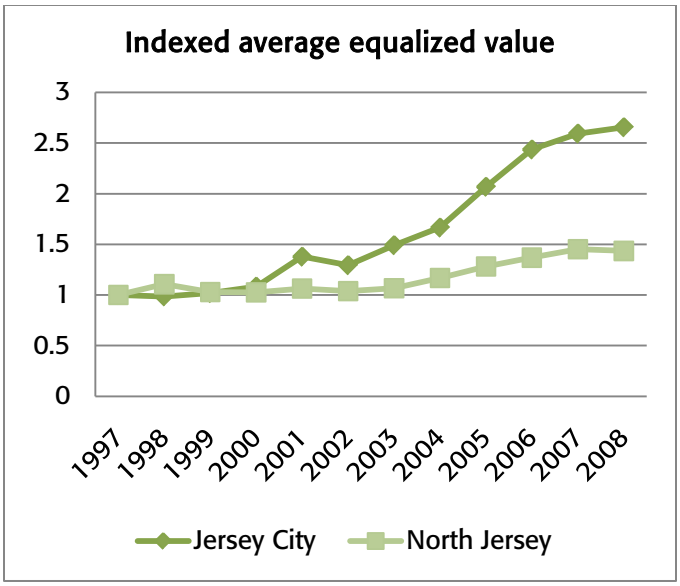


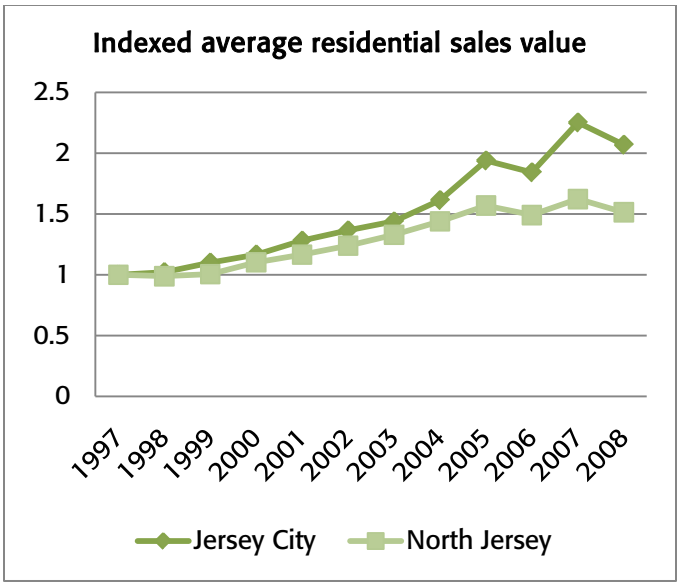


Jersey City (Journal Square) Transit Village vs. North Jersey Counties
(Bergen, Essex, Hudson, Morris, Passaic, Somerset, Sussex, Union & Warren Counties)

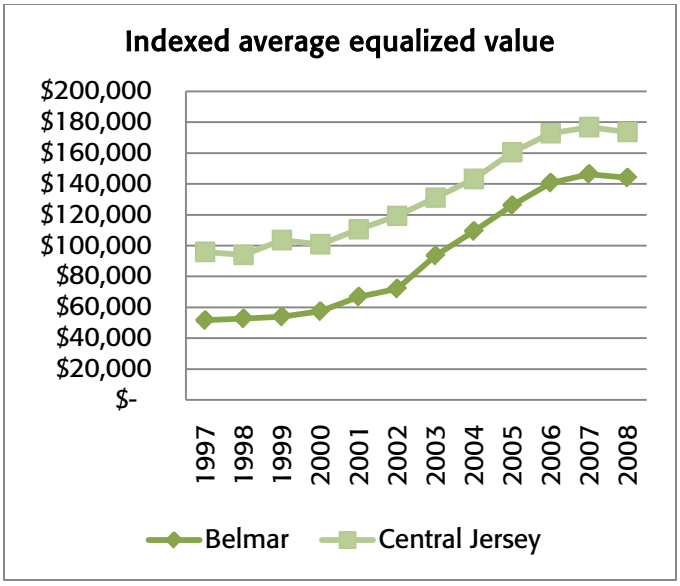


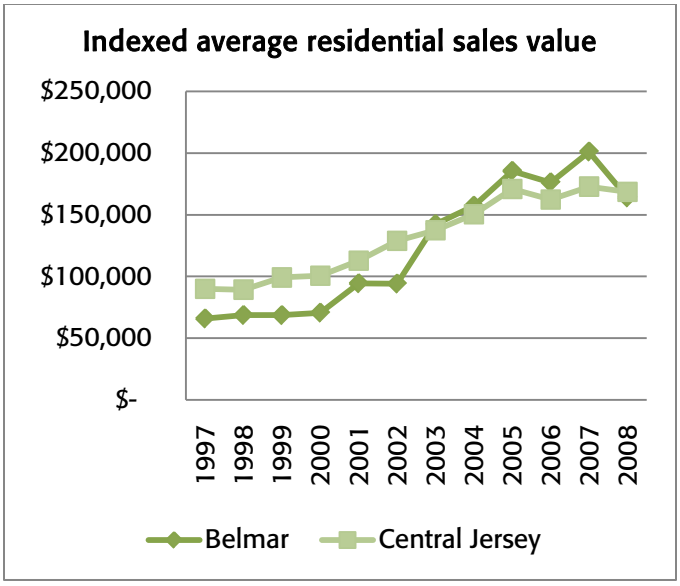


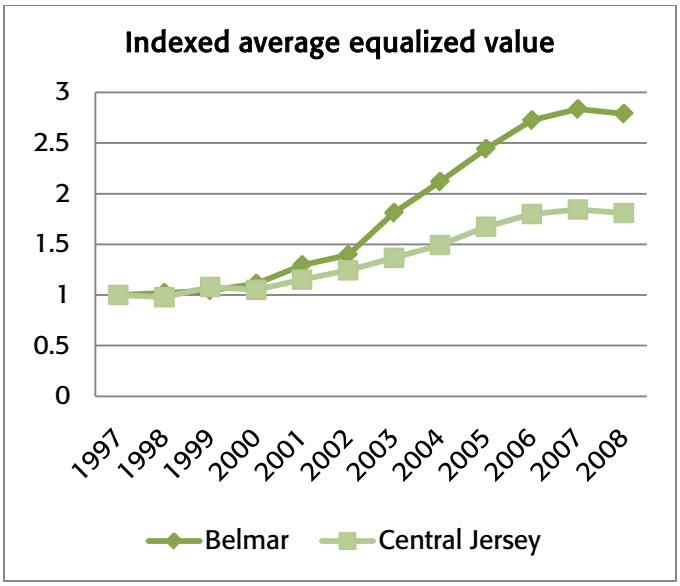


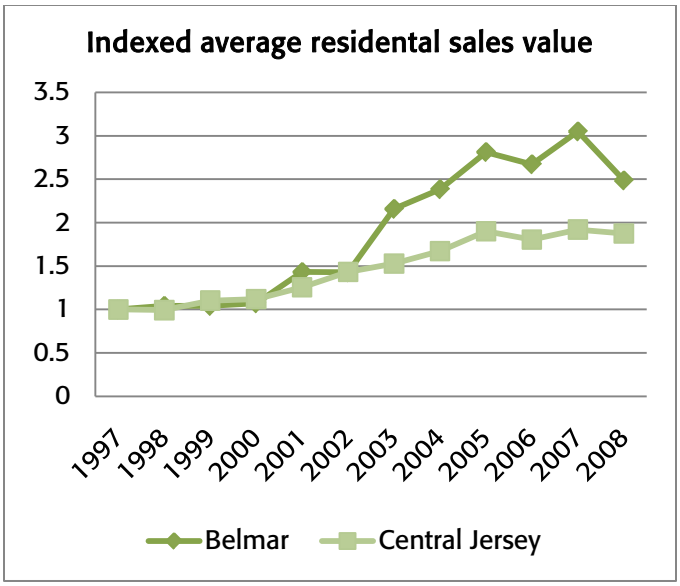


Belmar Transit Village vs. Central Jersey Counties
(Hunterdon, Mercer, Monmouth, Middlesex and Ocean Counties)

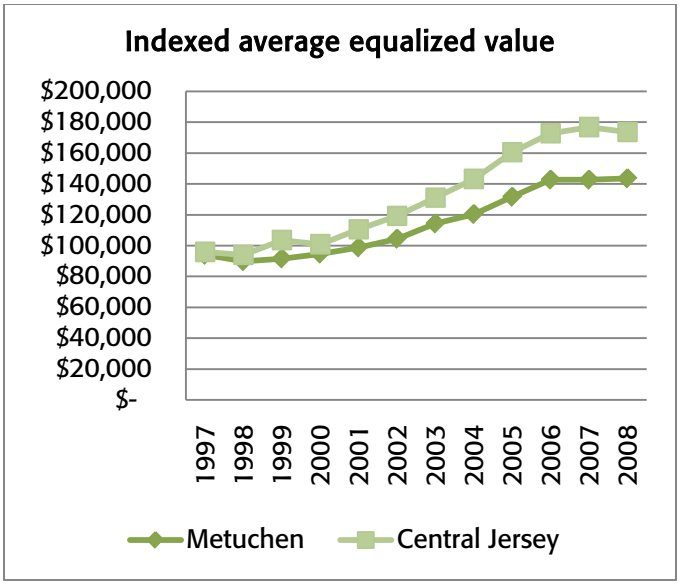


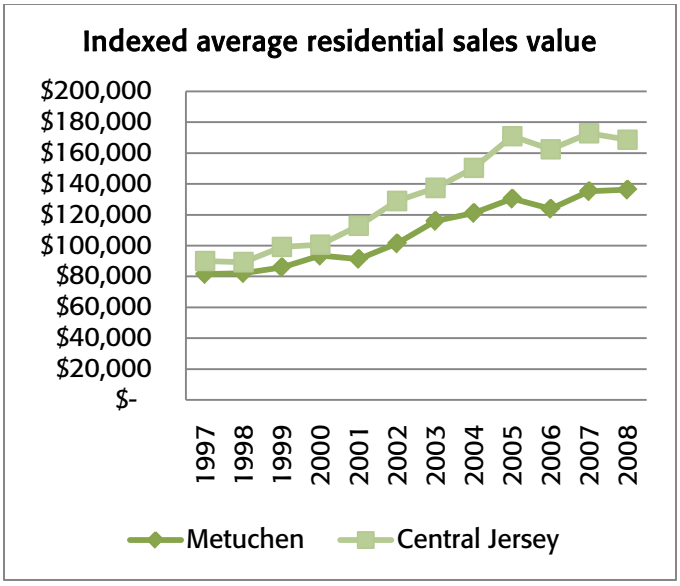


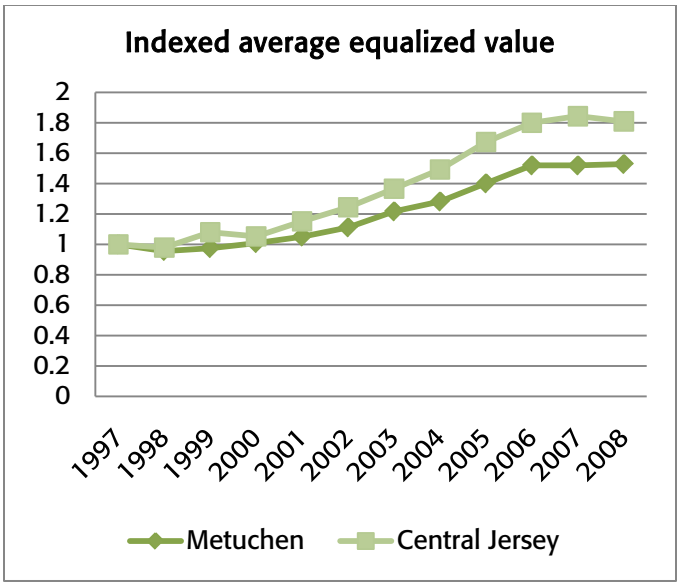


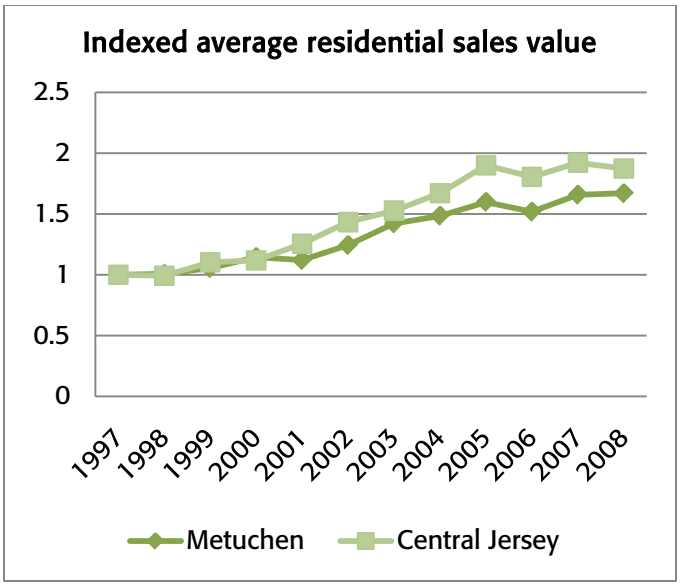


Metuchen Transit Village vs. Central Jersey Counties
(Hunterdon, Mercer, Monmouth, Middlesex and Ocean Counties)

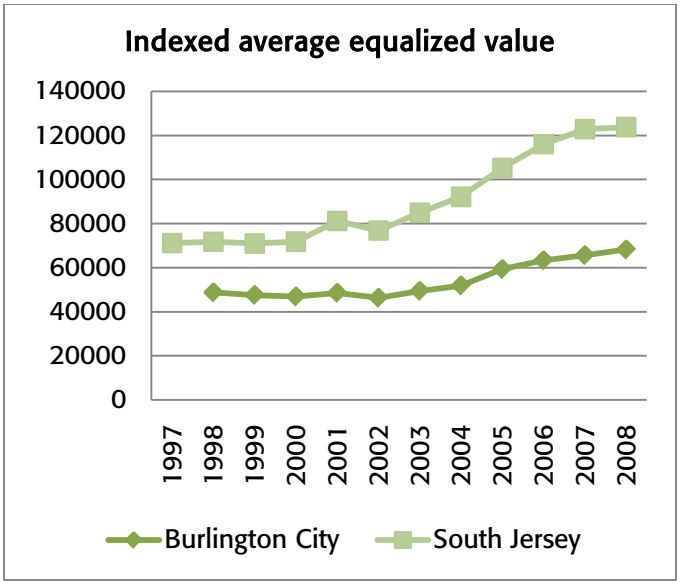


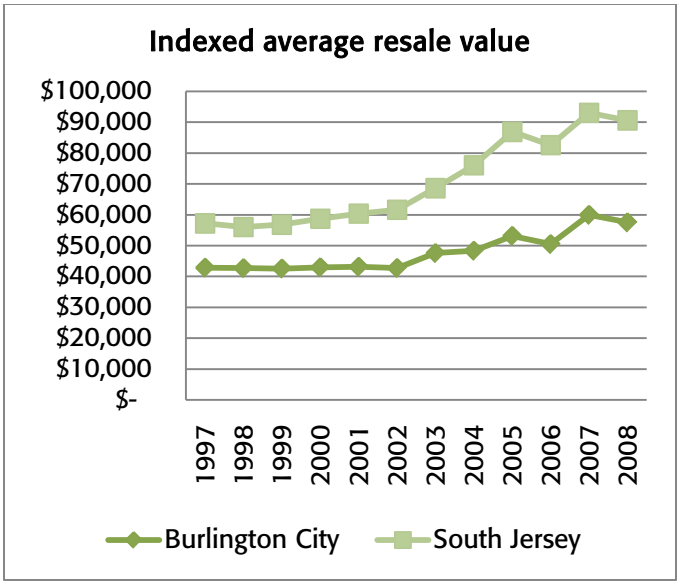


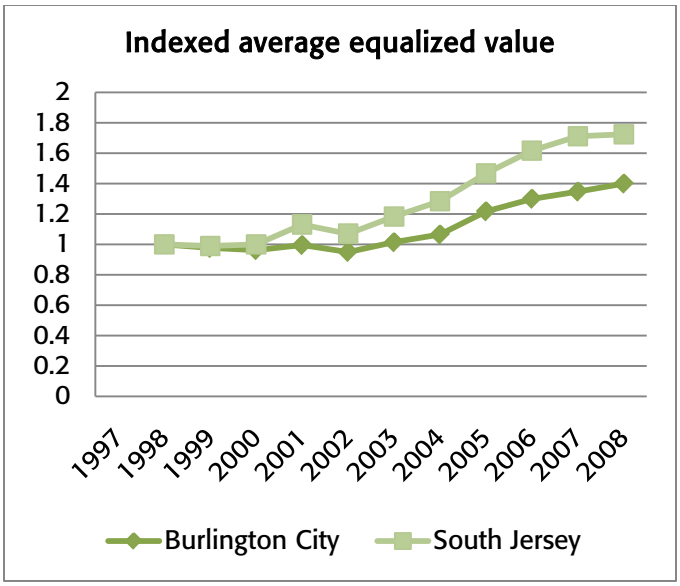


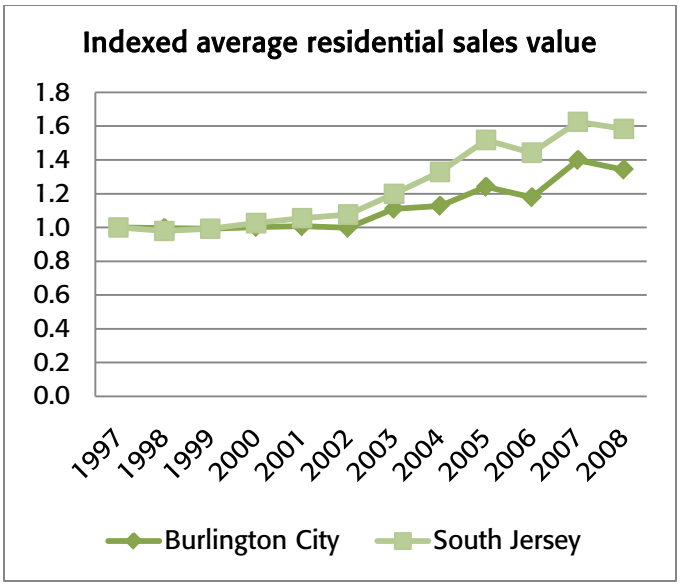


Burlington City Transit Village vs. South Jersey Counties
(Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem Counties)

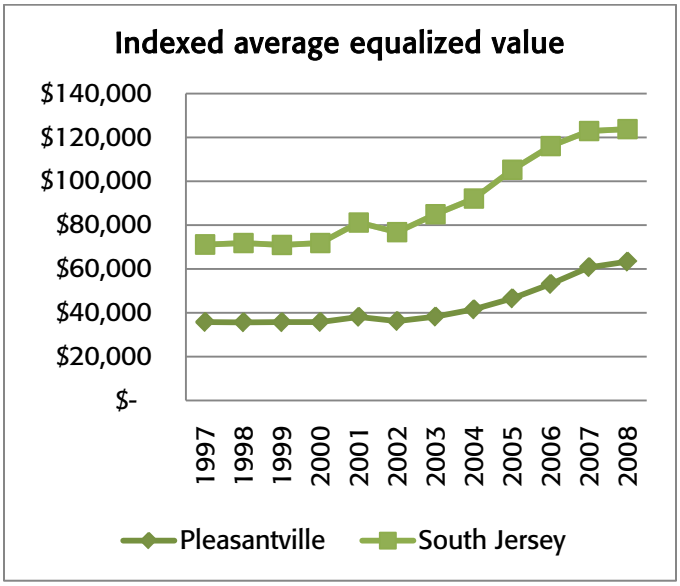


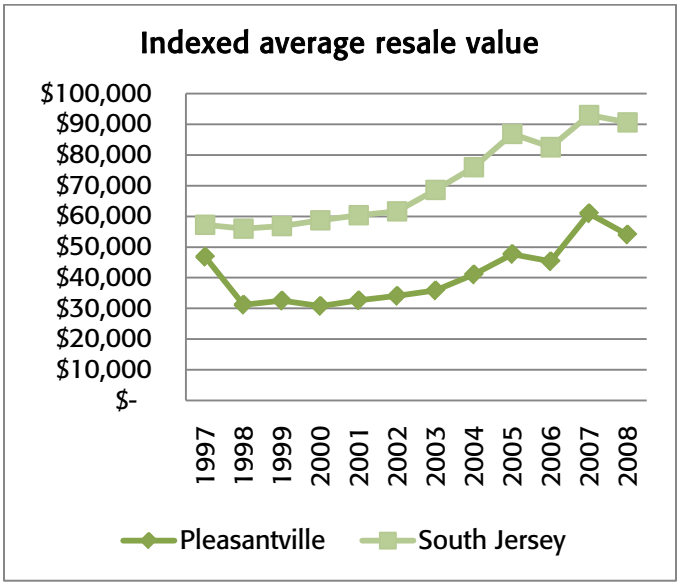


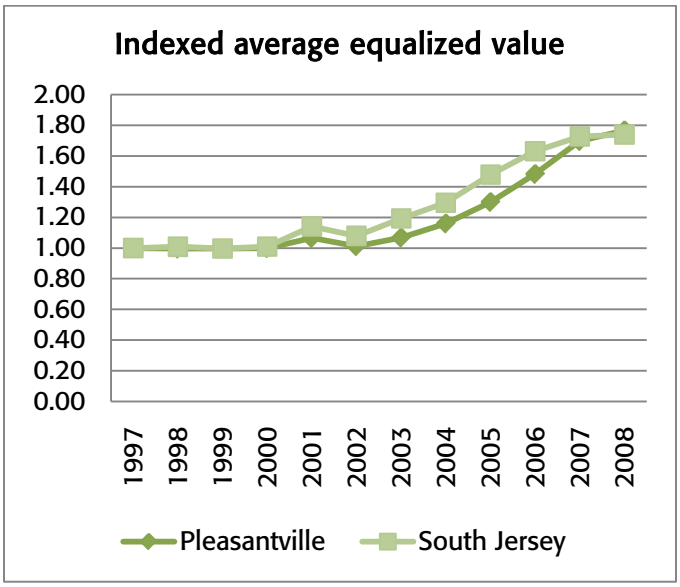


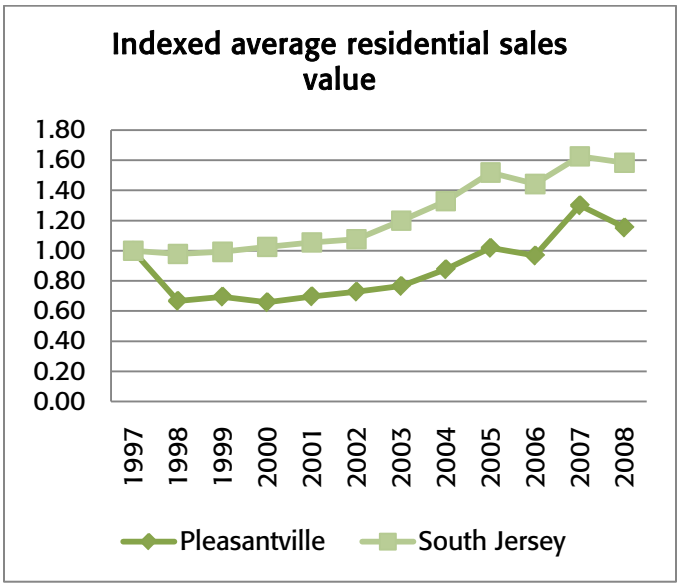


Pleasantville Transit Village vs. South Jersey Counties
(Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem Counties)



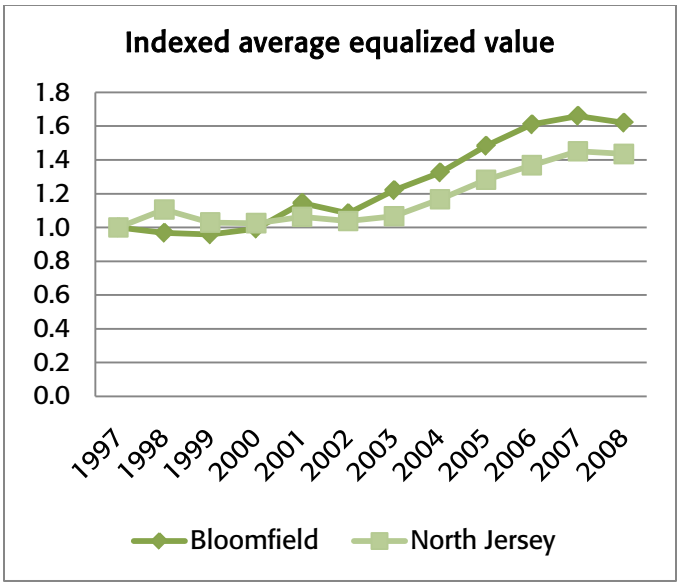


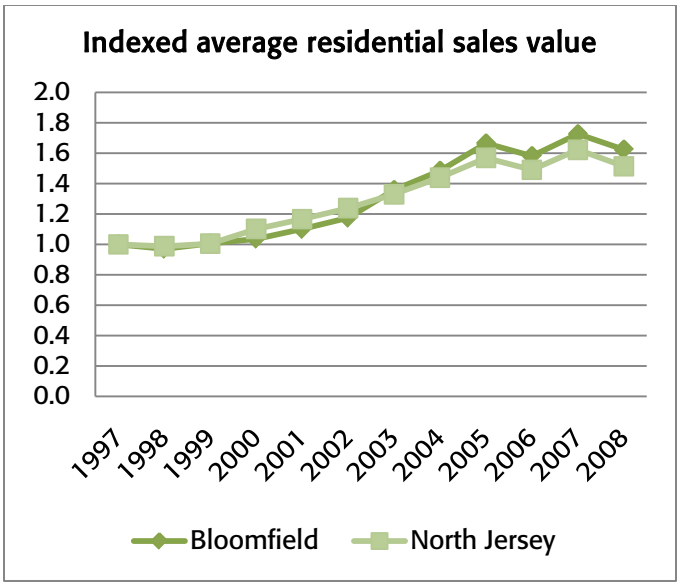




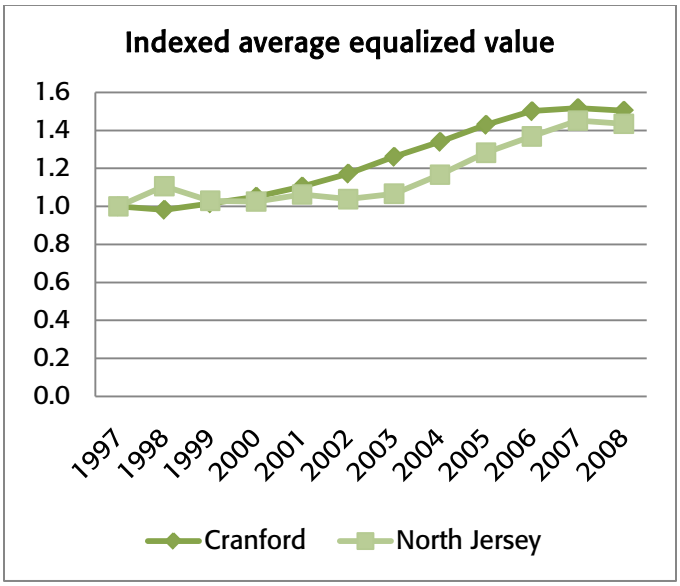
North Jersey Transit Villages

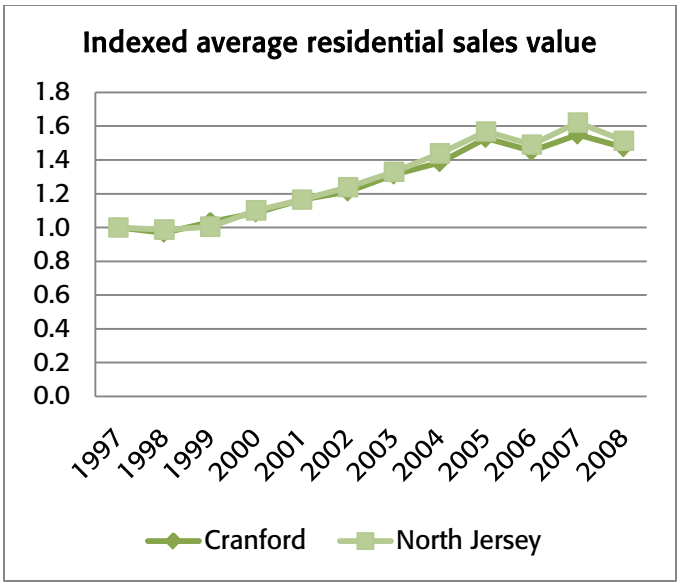
Bloomfield



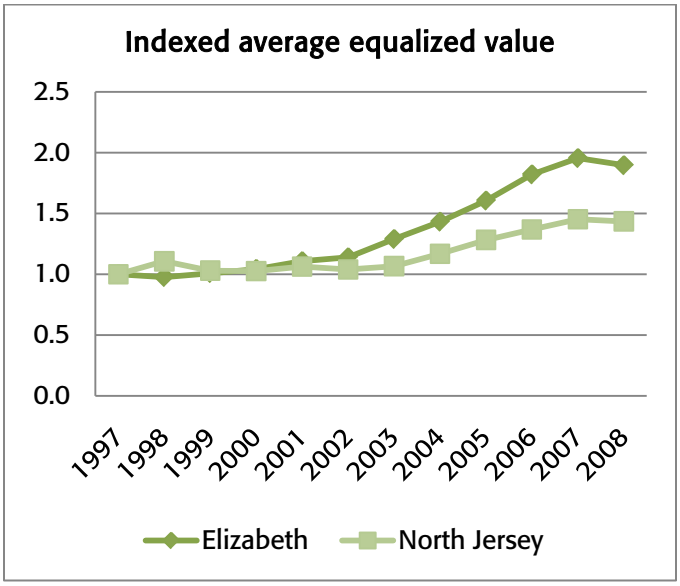


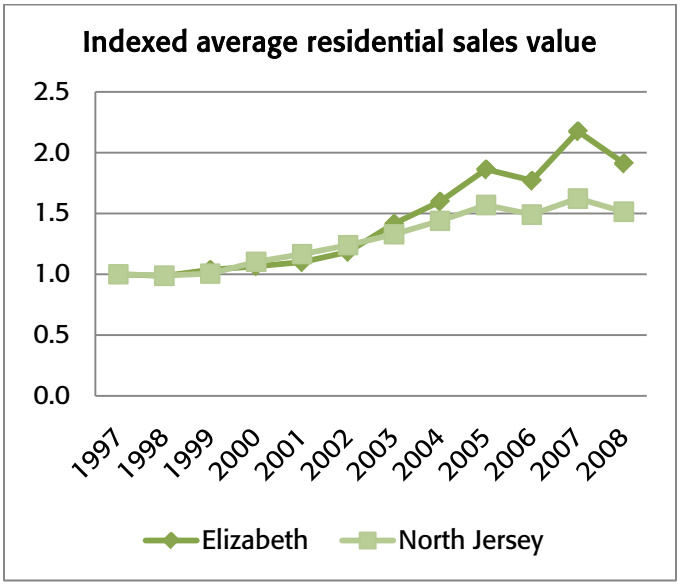
Cranford



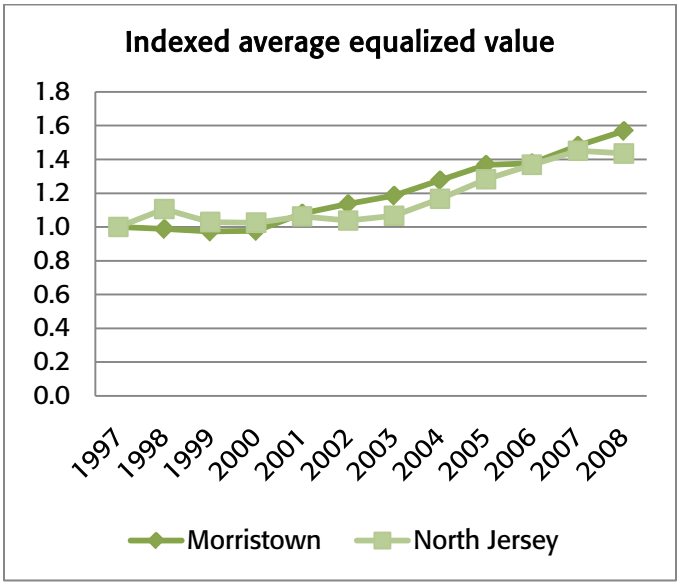


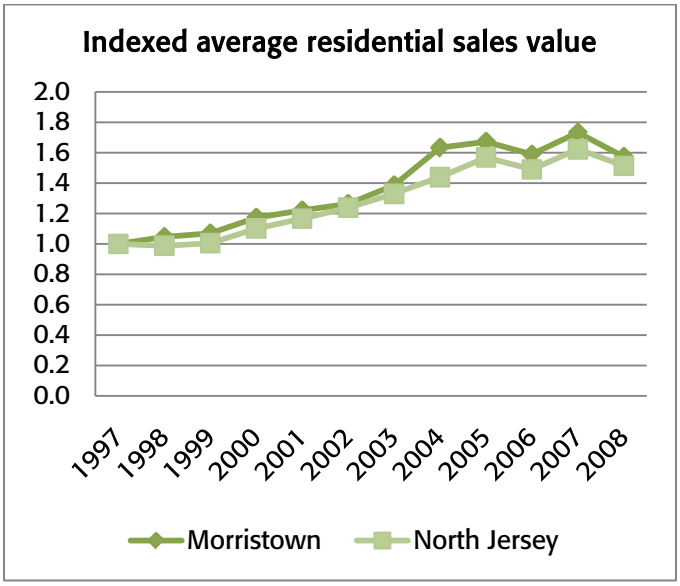
Elizabeth



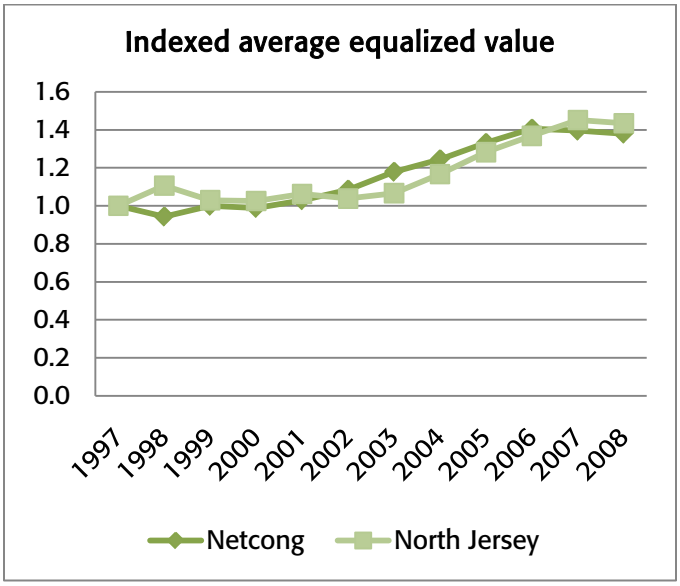


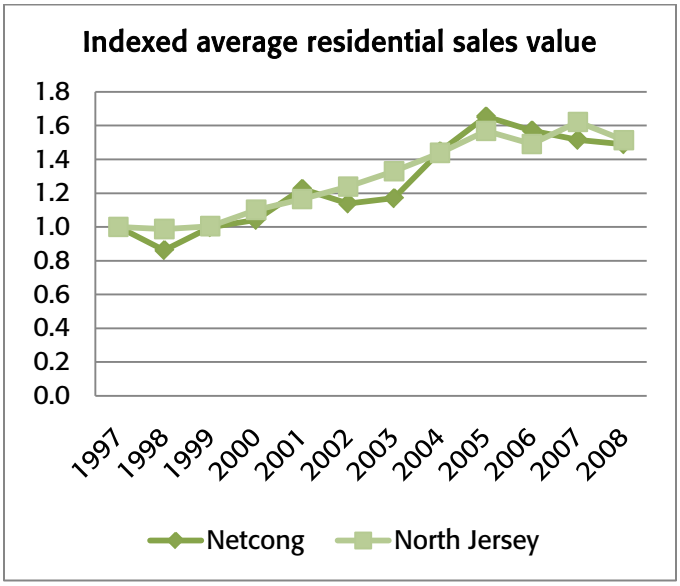
Morristown



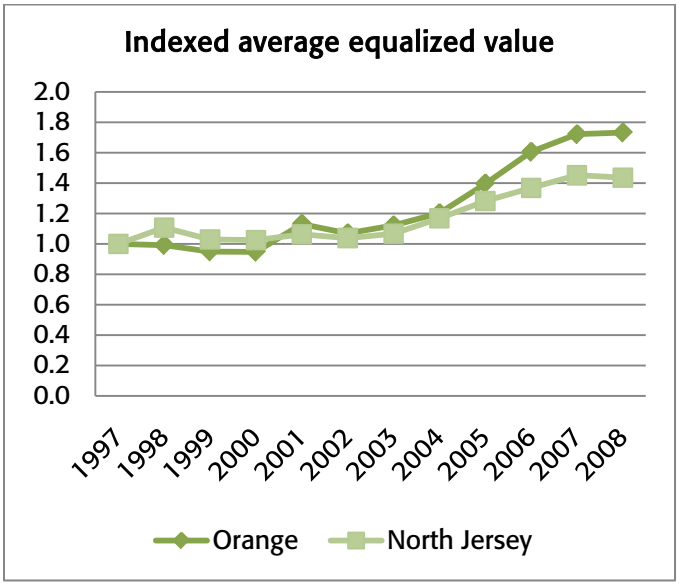


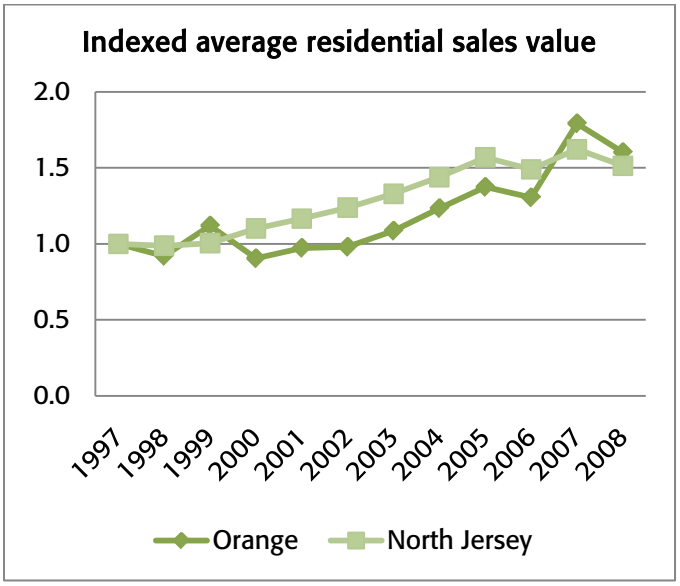
Netcong



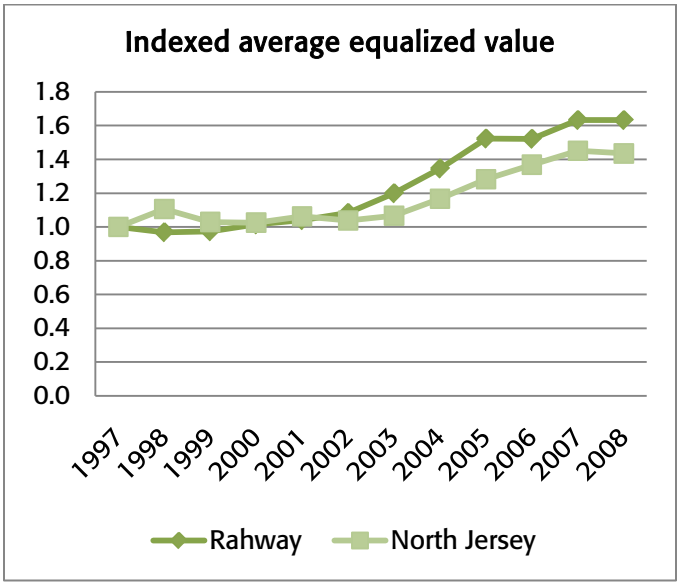


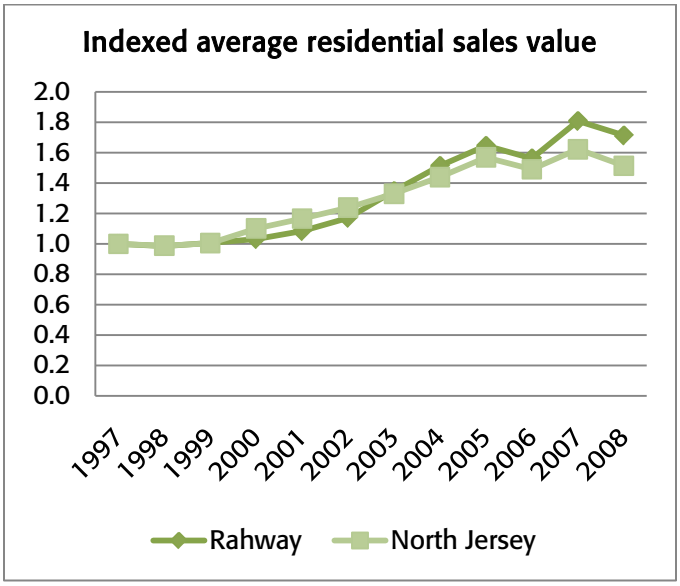
Orange



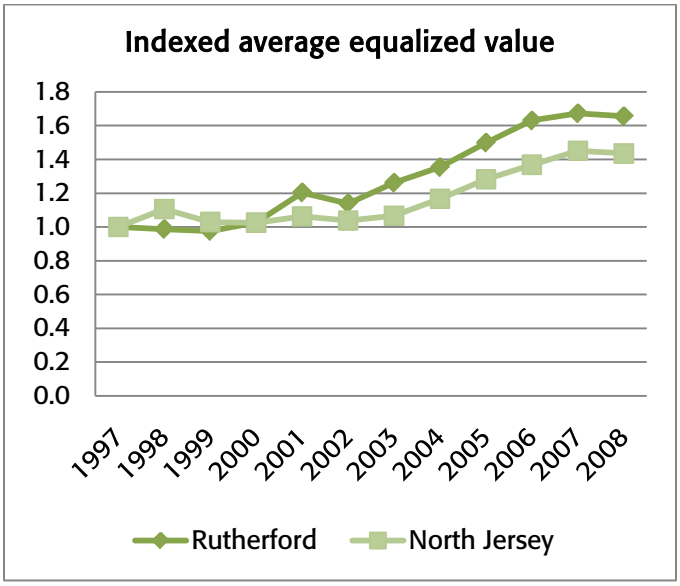


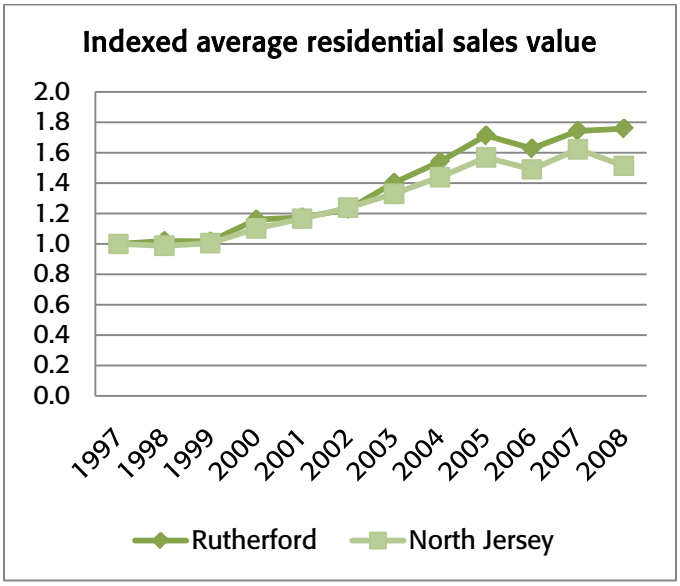
Rahway



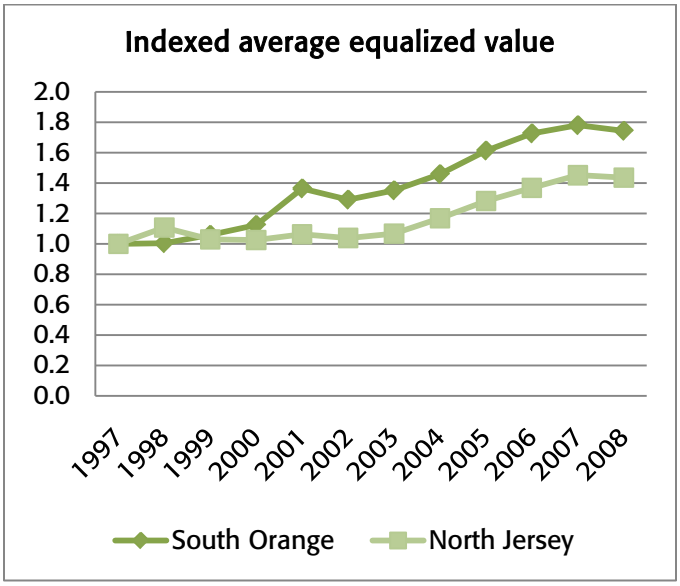


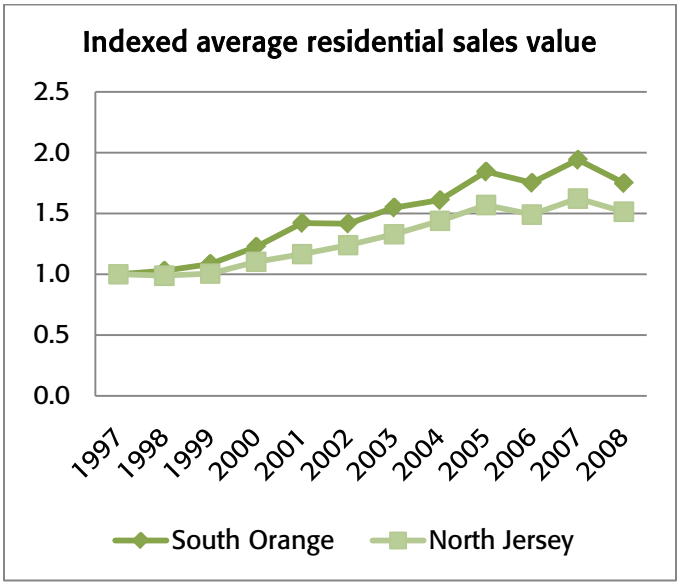
Rutherford





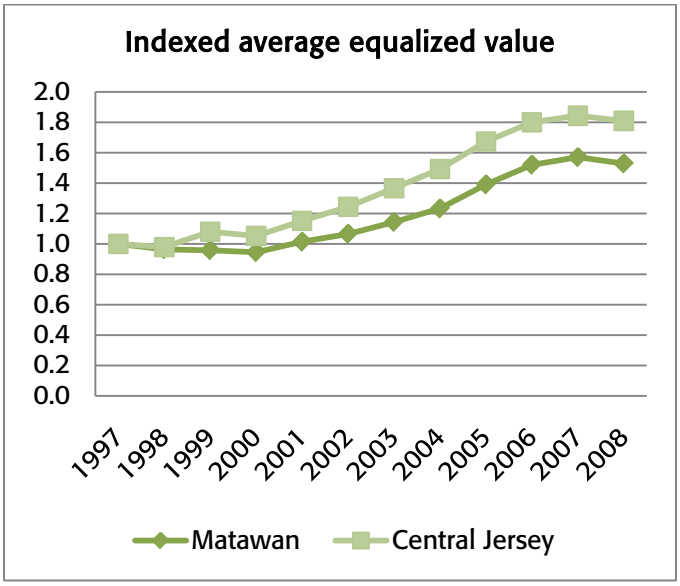
South Orange

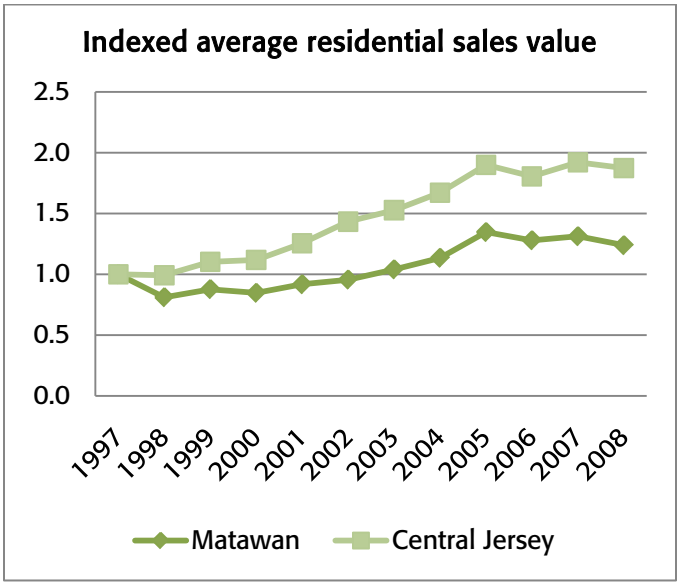




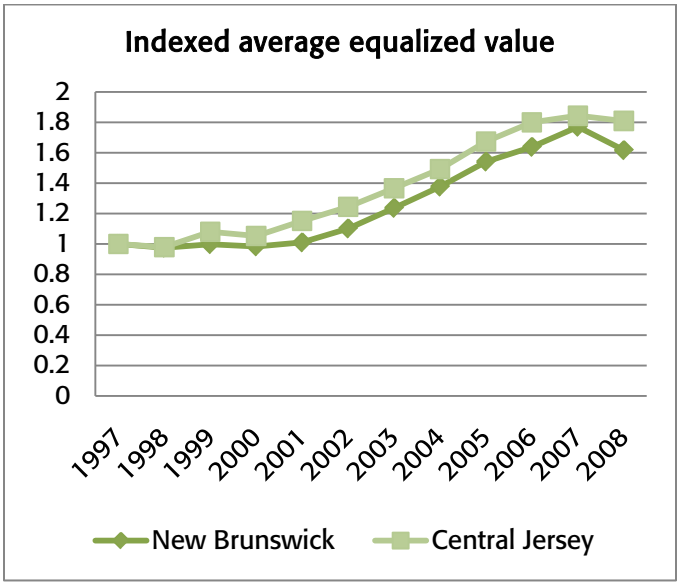
Central Jersey Transit Villages

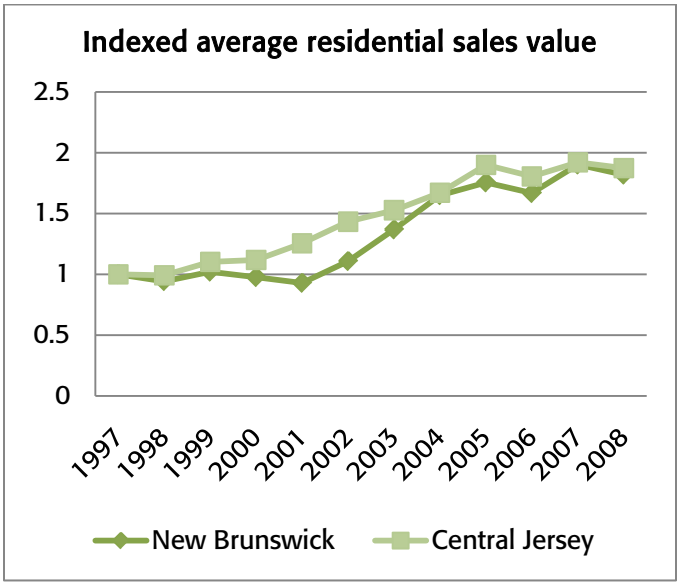
Matawan



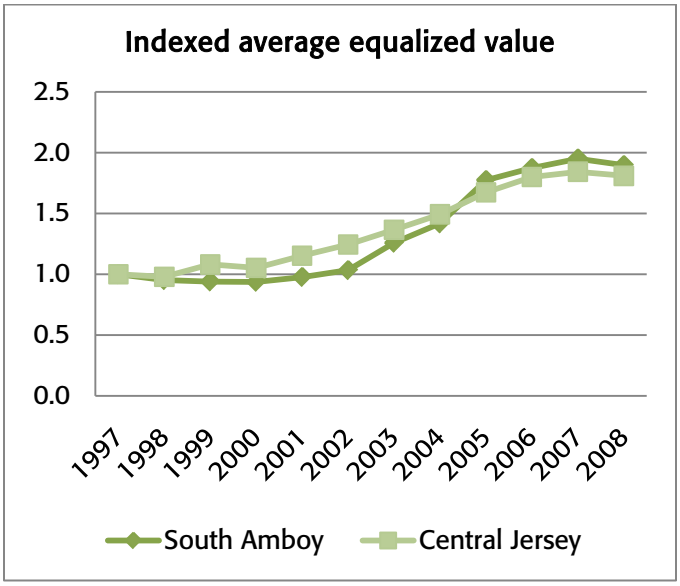


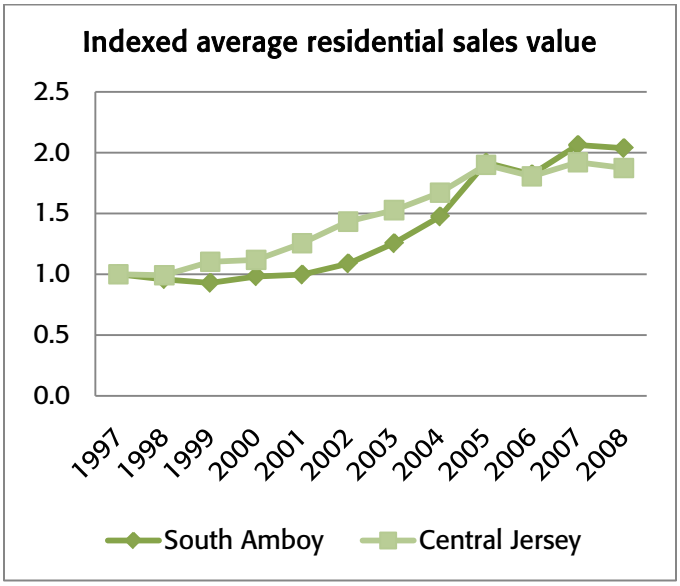
New Brunswick





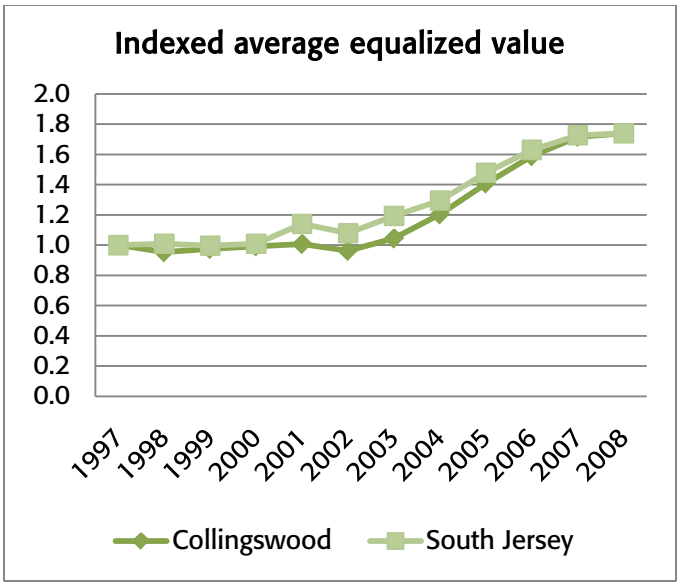
South Amboy

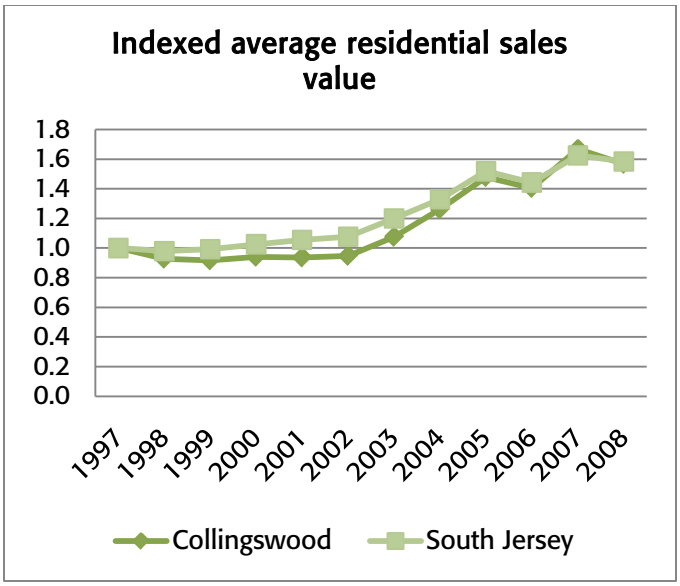

Indexed average equalized value
2.5
2.0
1.5
1.0
0.5
0.0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
South Amboy
Central Jersey


Indexed average residential sales value
2.5
2.0
1.5
1.0
0.5
0.0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
South Amboy
Central Jersey

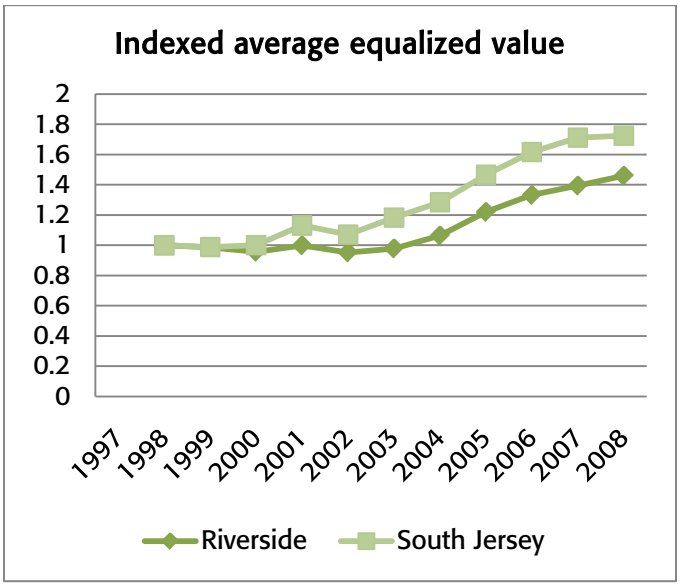
South Jersey Transit Villages

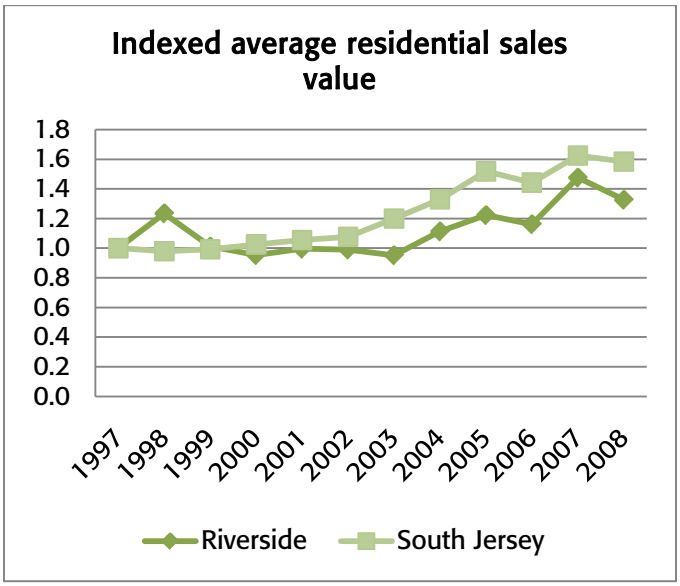
Collingswood





Riverside

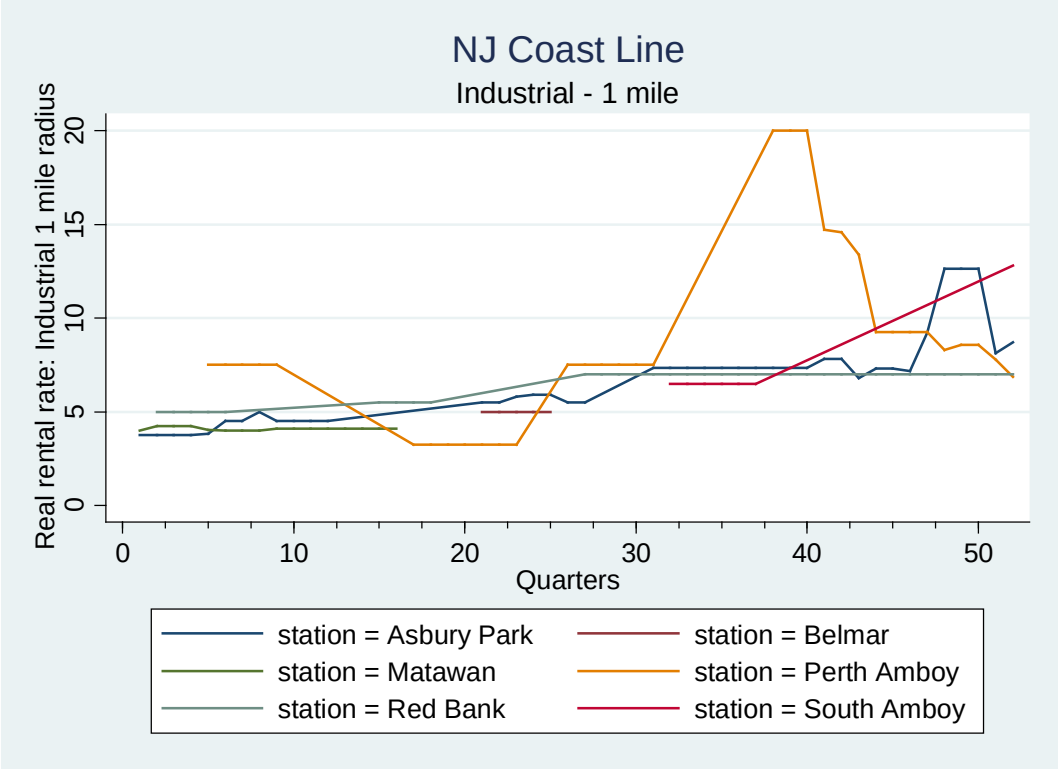


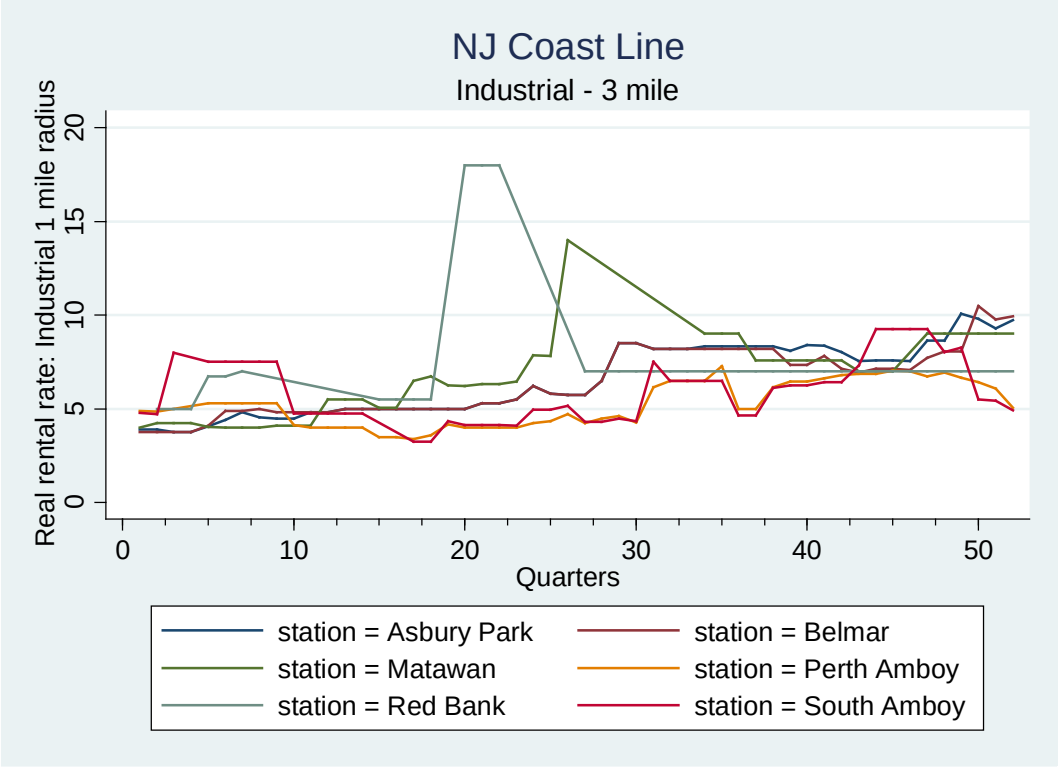


Appendix B: Graphical Analysis of Commercial Real Estate Prices

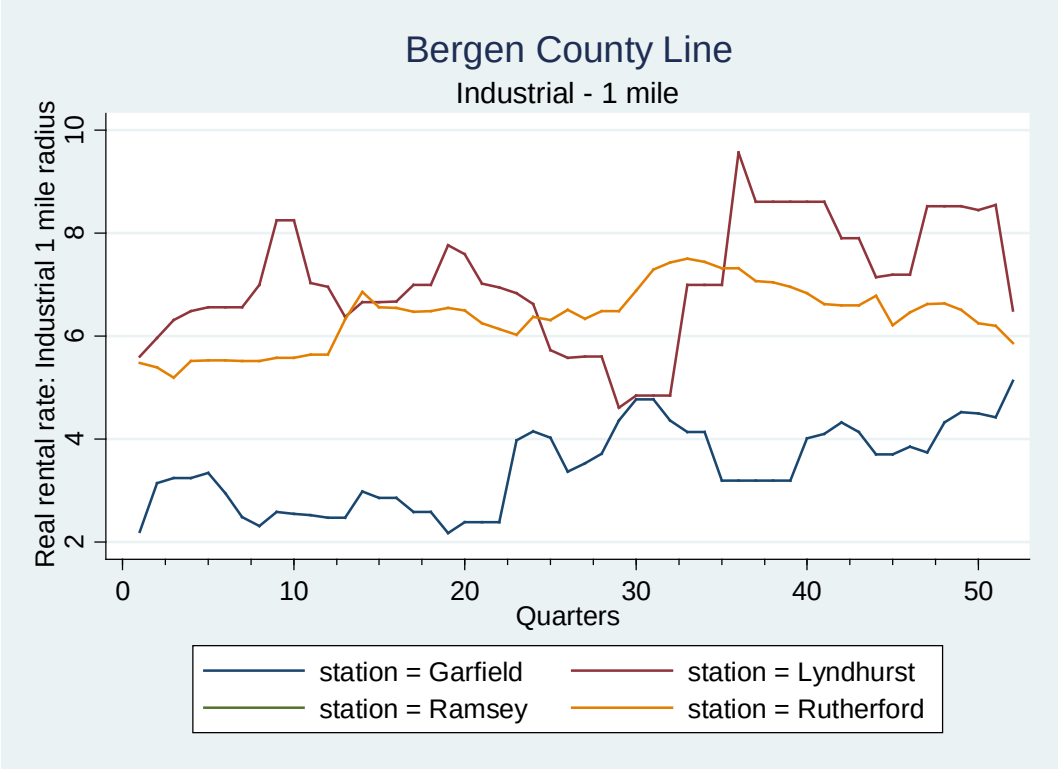
These graphs include both Transit Villages and selected control municipalities along the same rail line. Transit villages are indicated at bottom of each page. Quarters indicate data starting 1997 up till 2009. Graphs include Industrial, Office, and Retail for 1 and 3 mile radiuses.

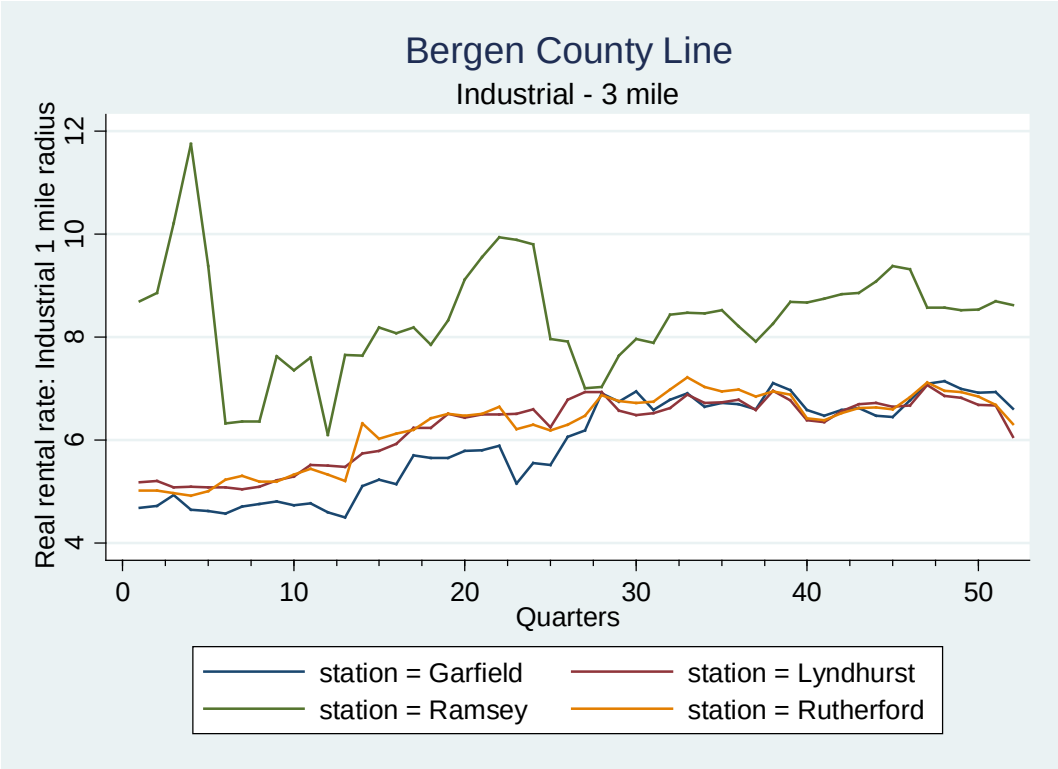
Graphs of industrial rental rates



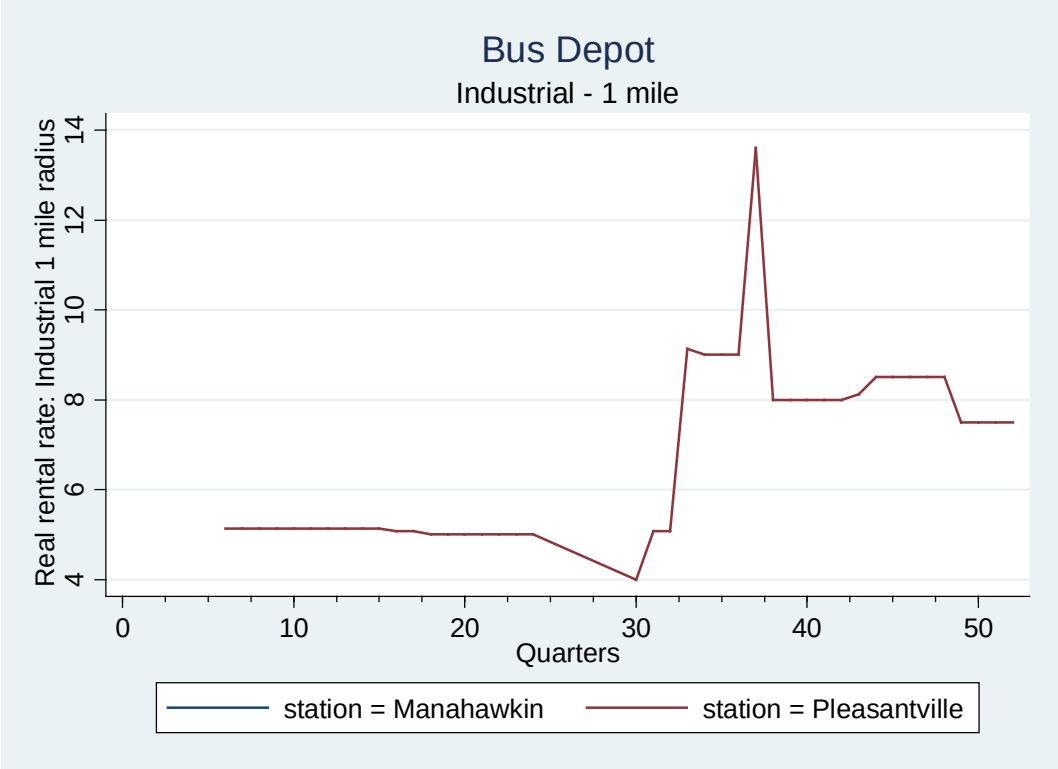


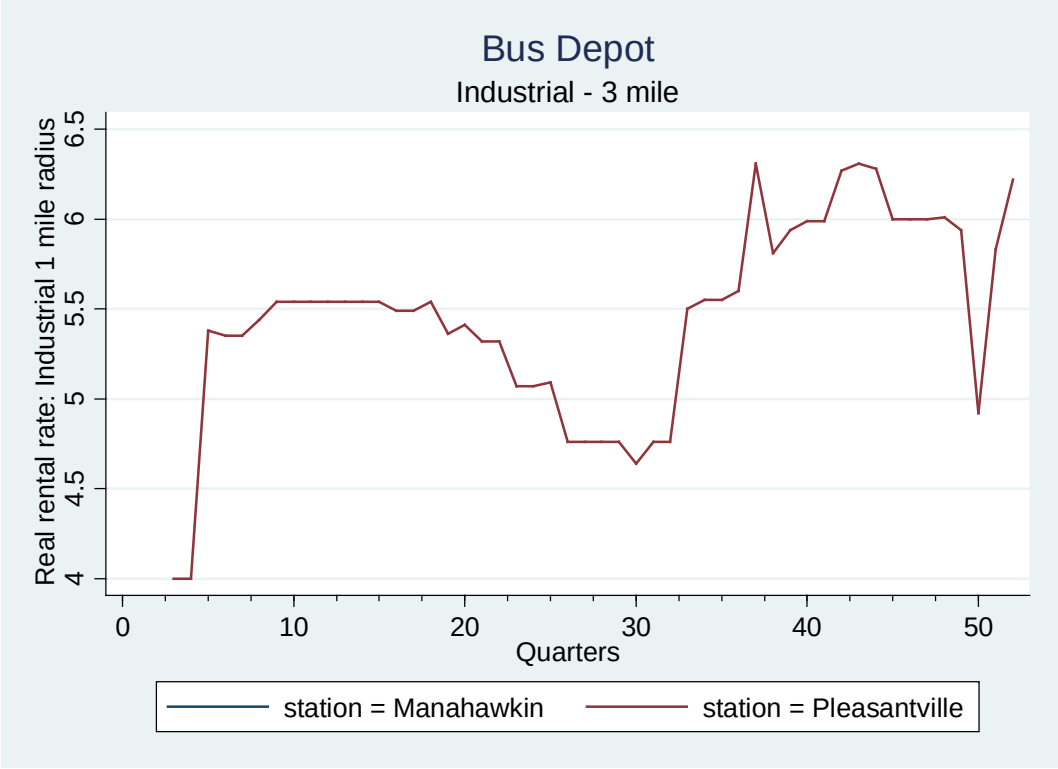
Transit village stations: Matawan (2003), Belmar (2003), South Amboy (1999)



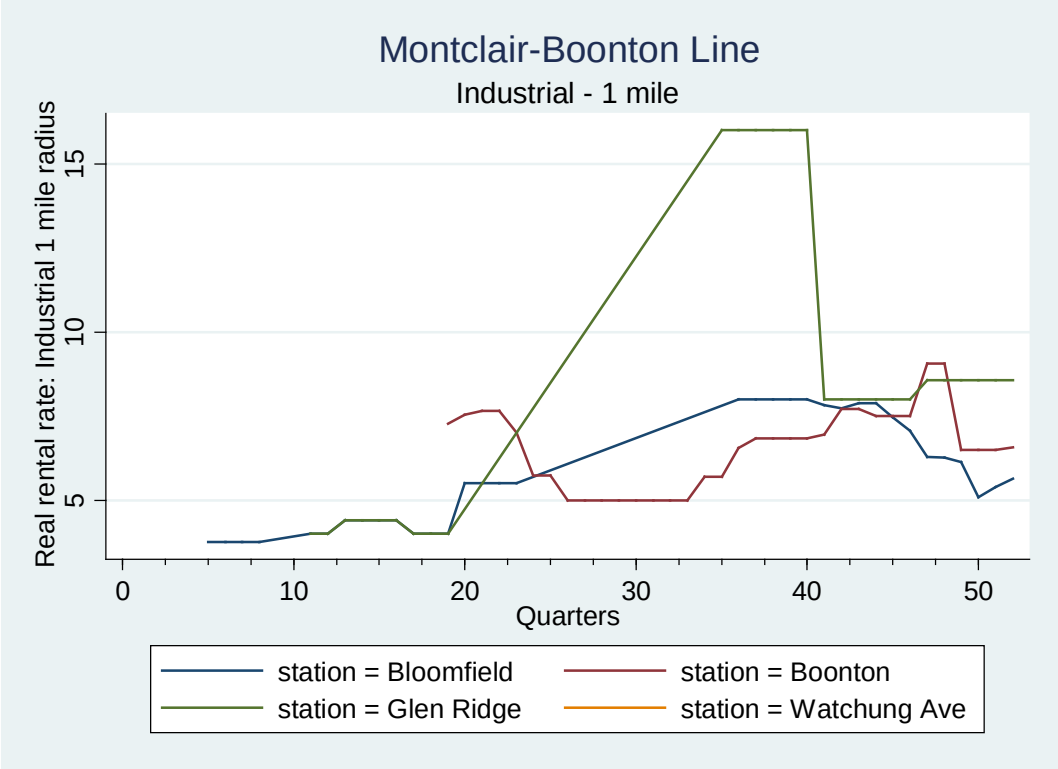


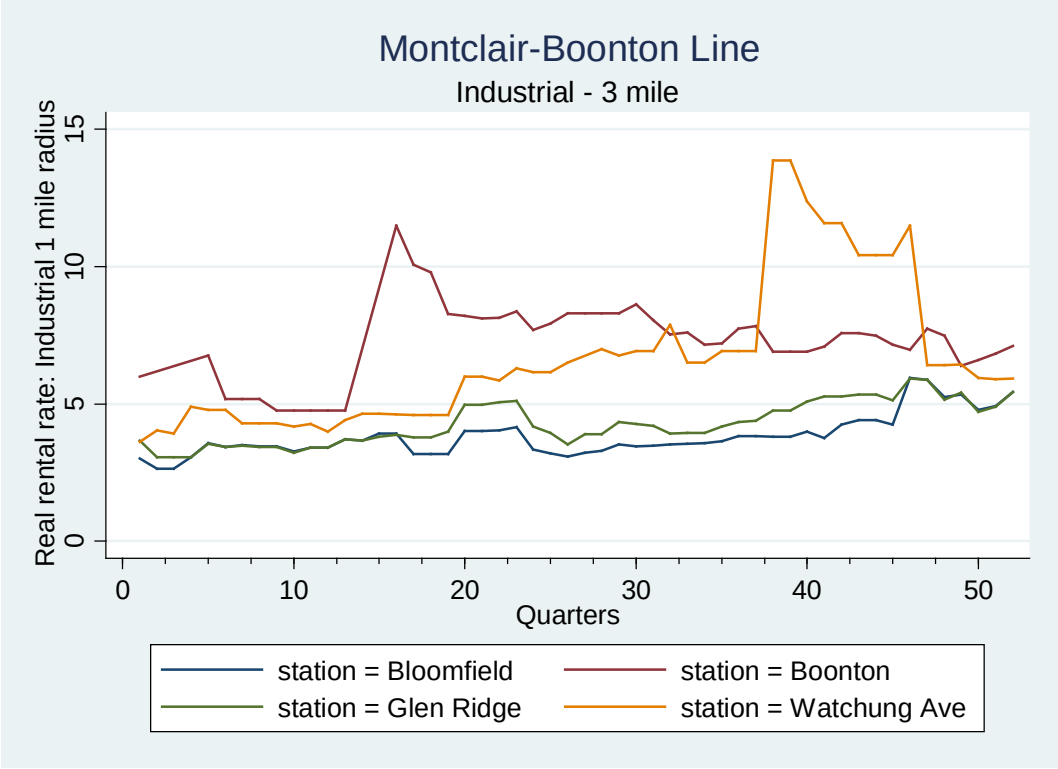
Transit village stations: Rutherford (1999)



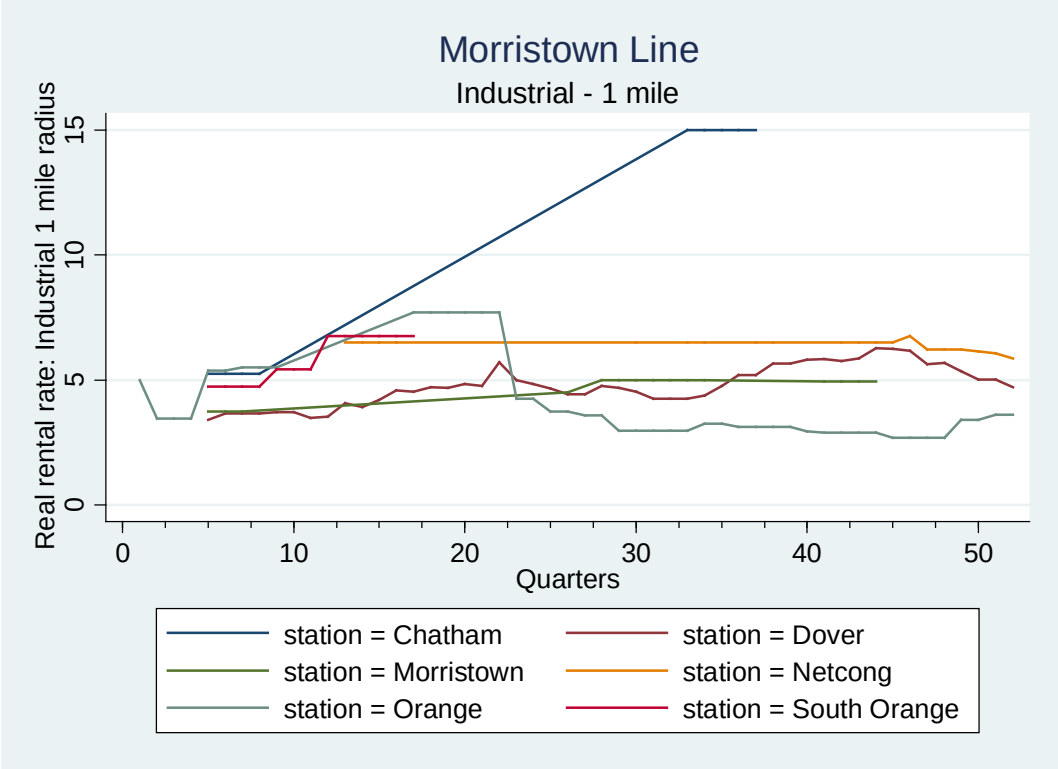


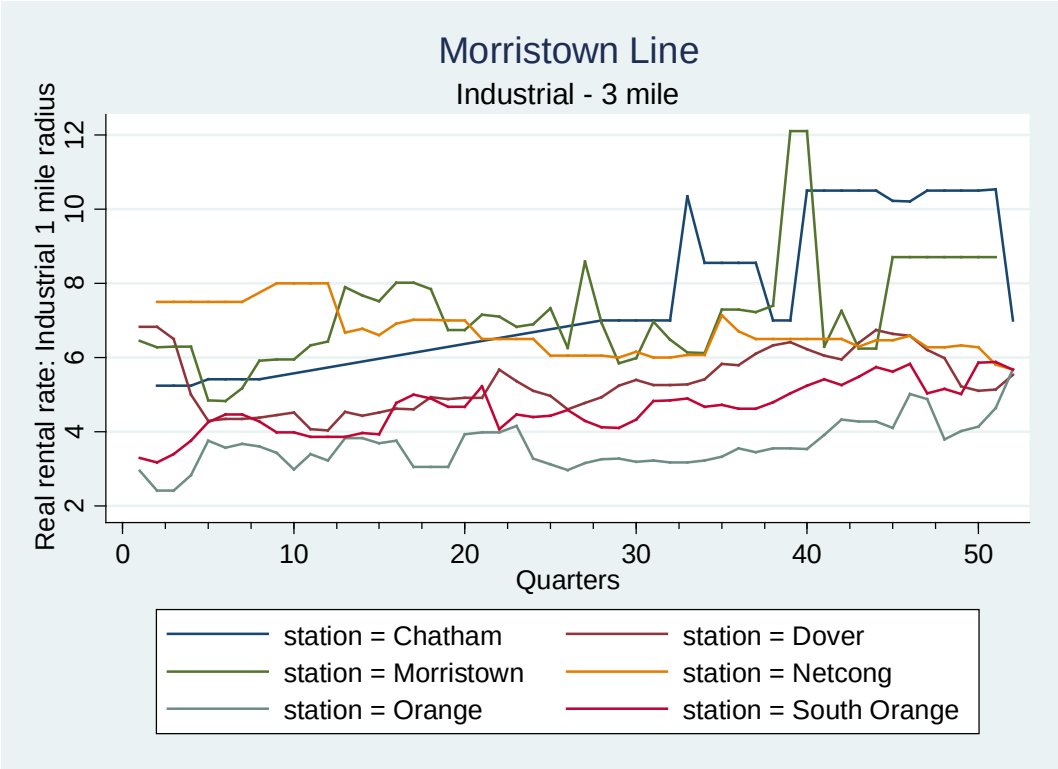
Transit village: Pleasantville (1999)



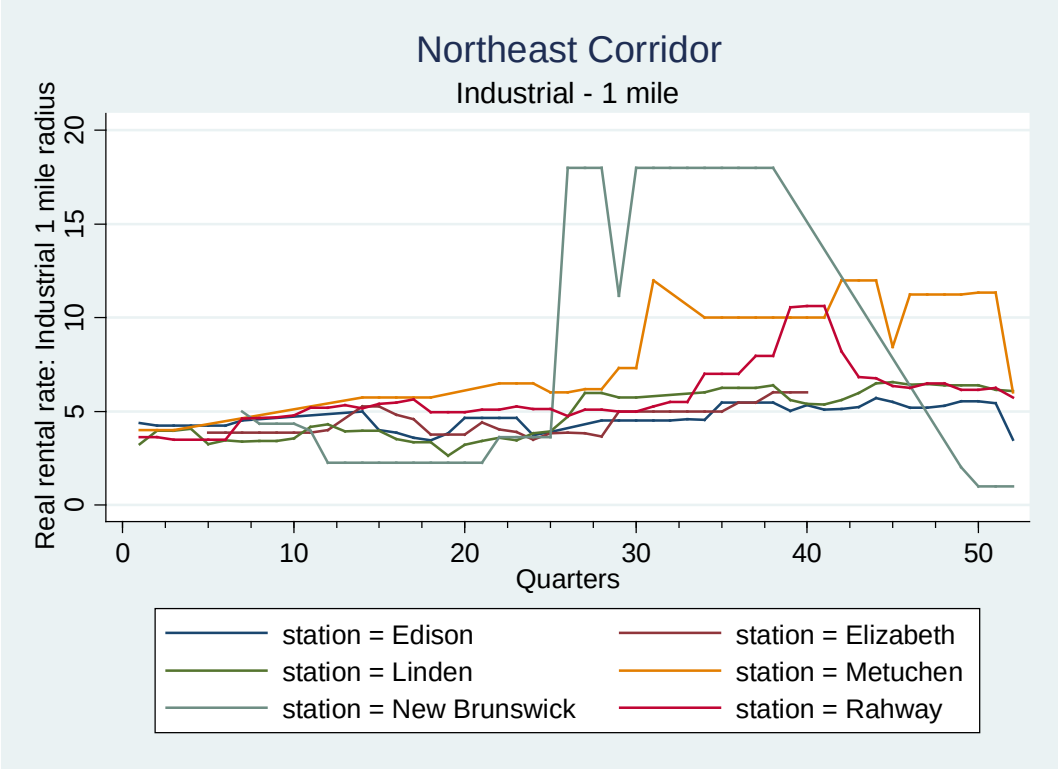


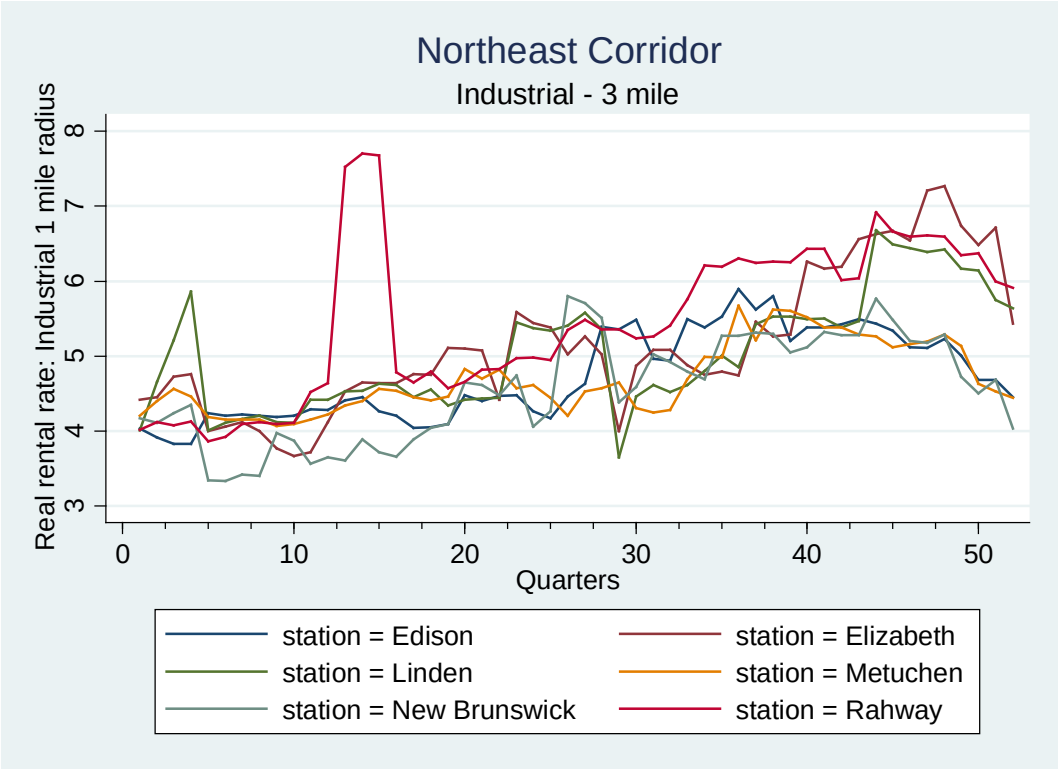
Transit village stations: Bloomfield (2003)



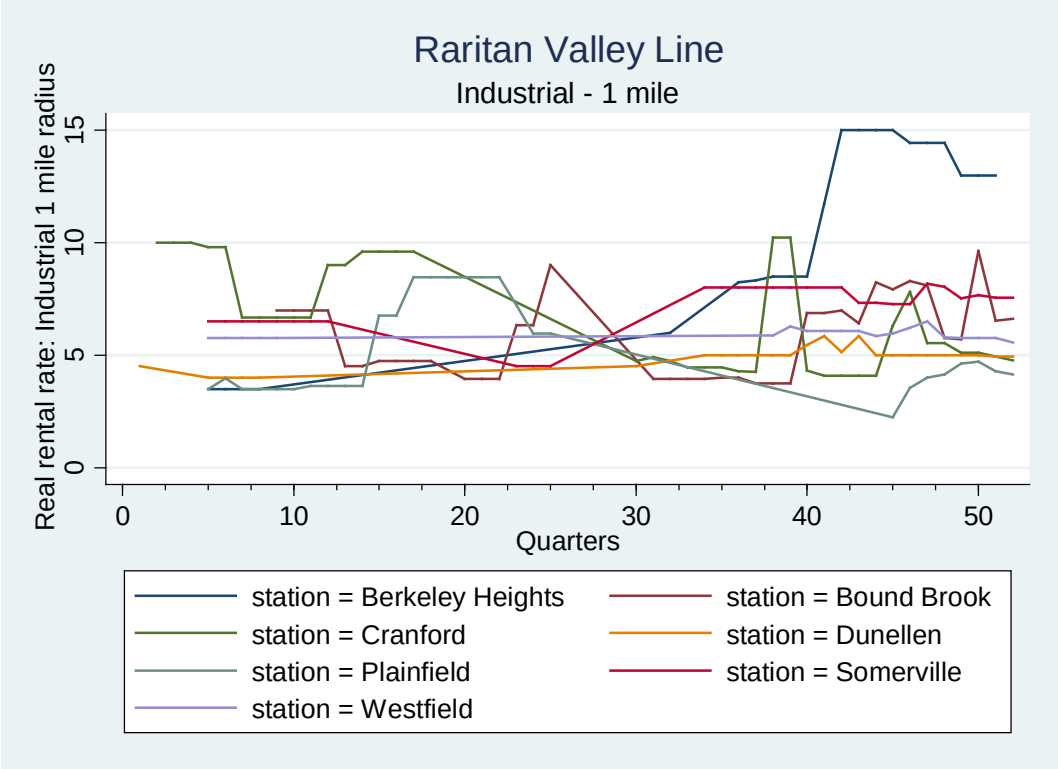


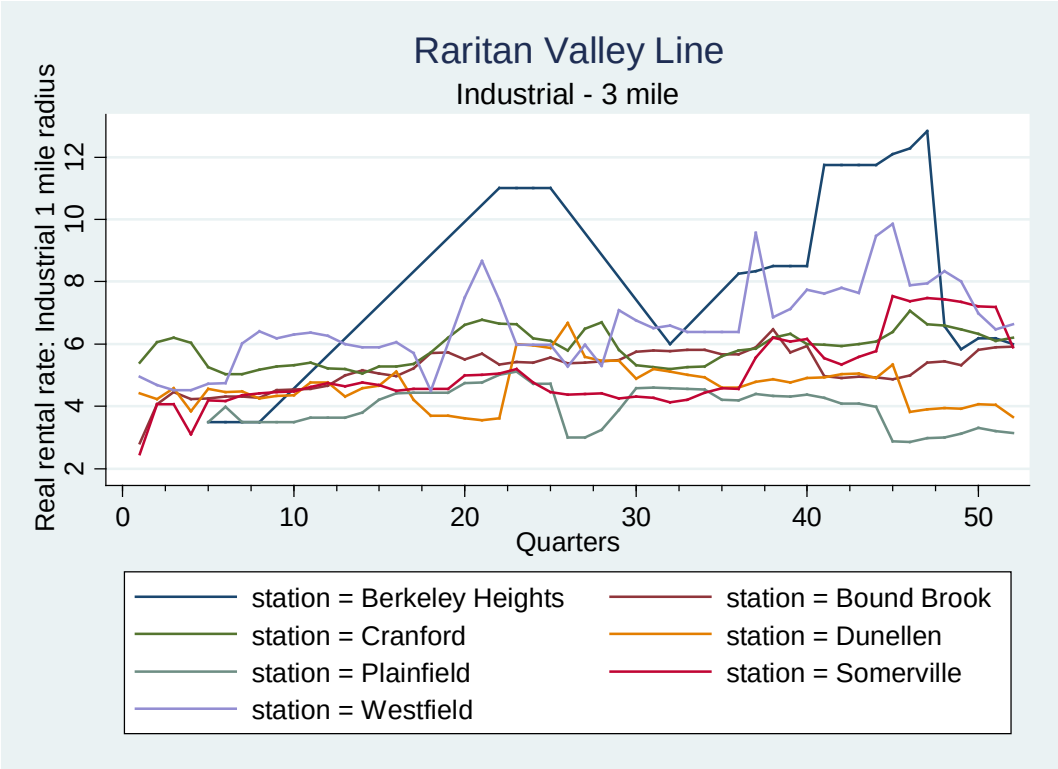
Transit village stations: Morristown (1999), Netcong (2005), Orange (2009), South Orange (1999)



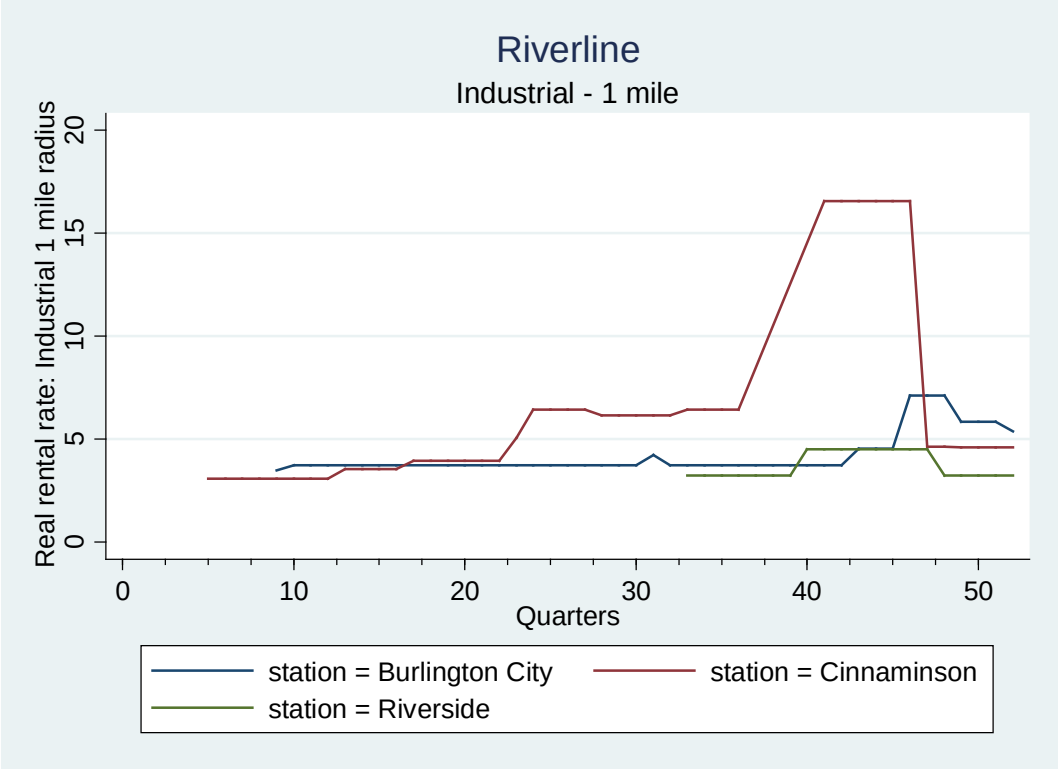


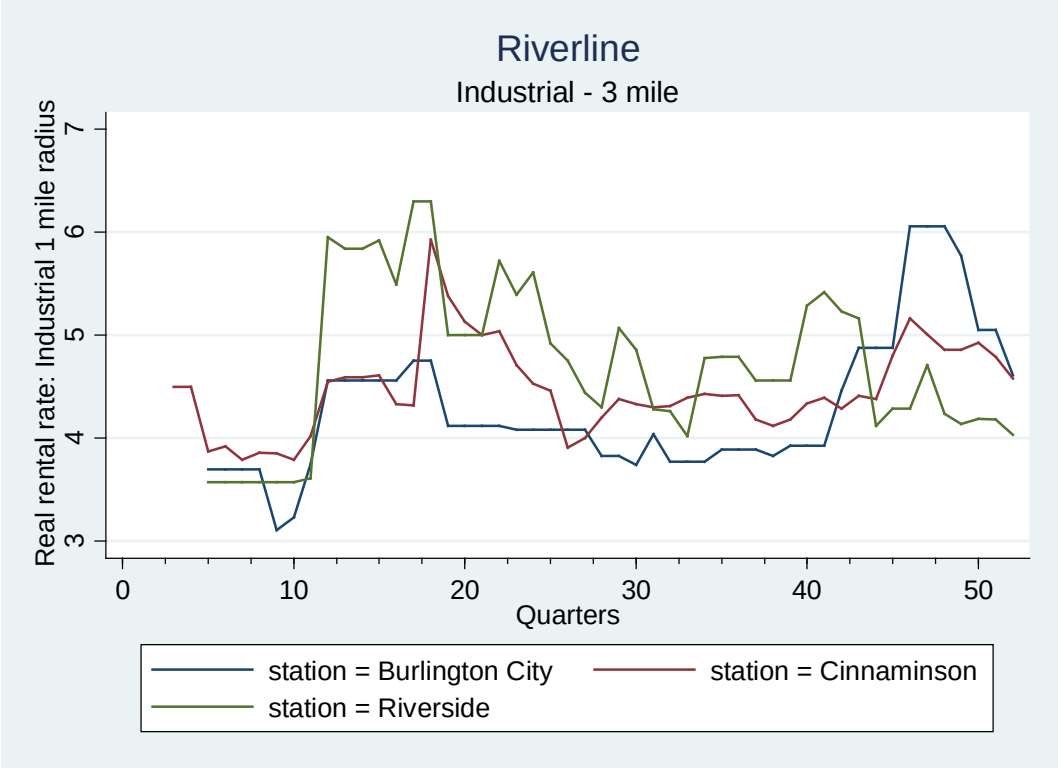
Transit village stations: Elizabeth (2007), Metuchen (2003), New Brunswick (2005), Rahway (2002)





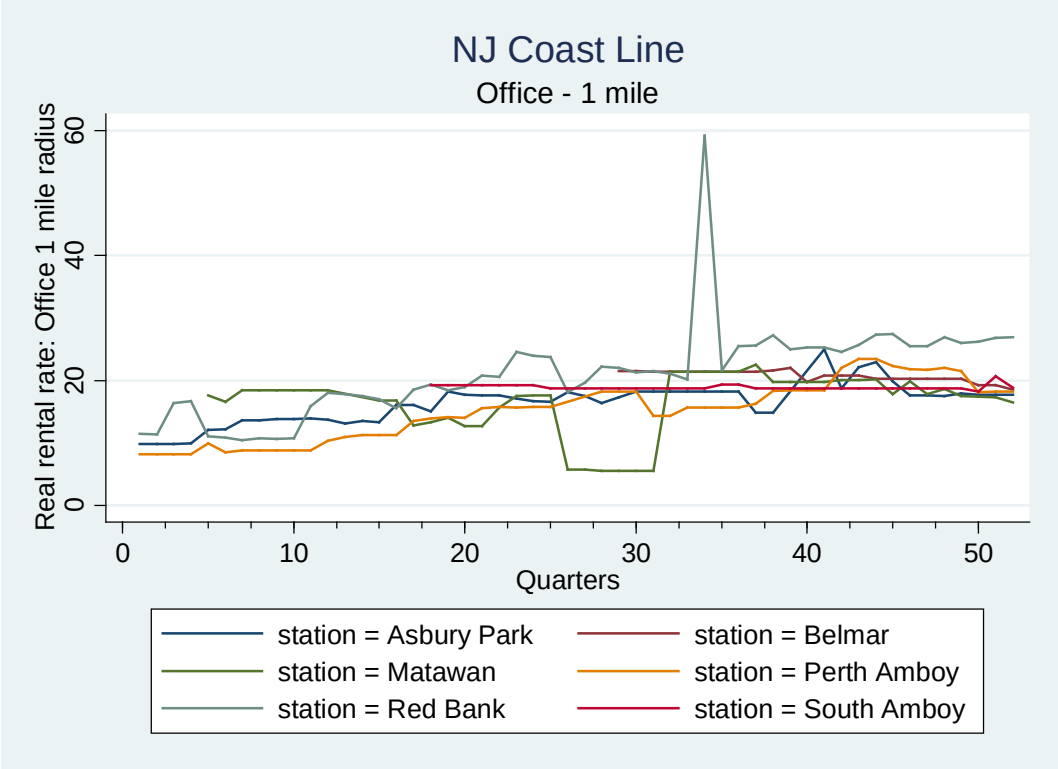
Transit village stations: Bound Brook (2003), Cranford (2003)

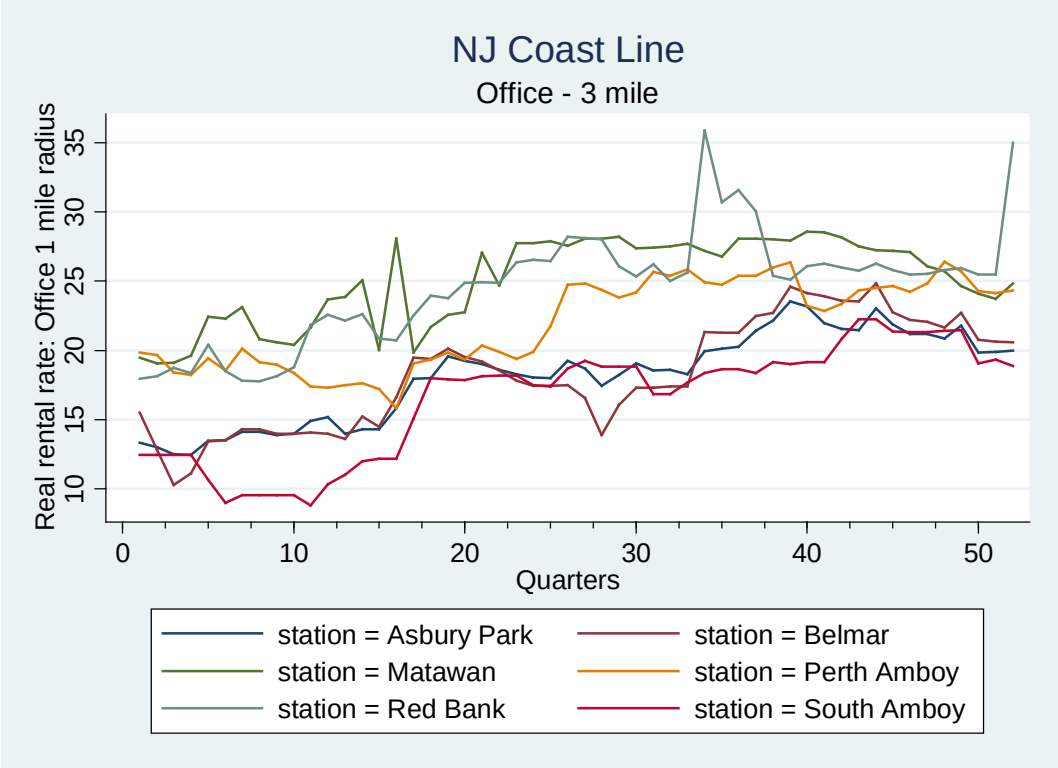




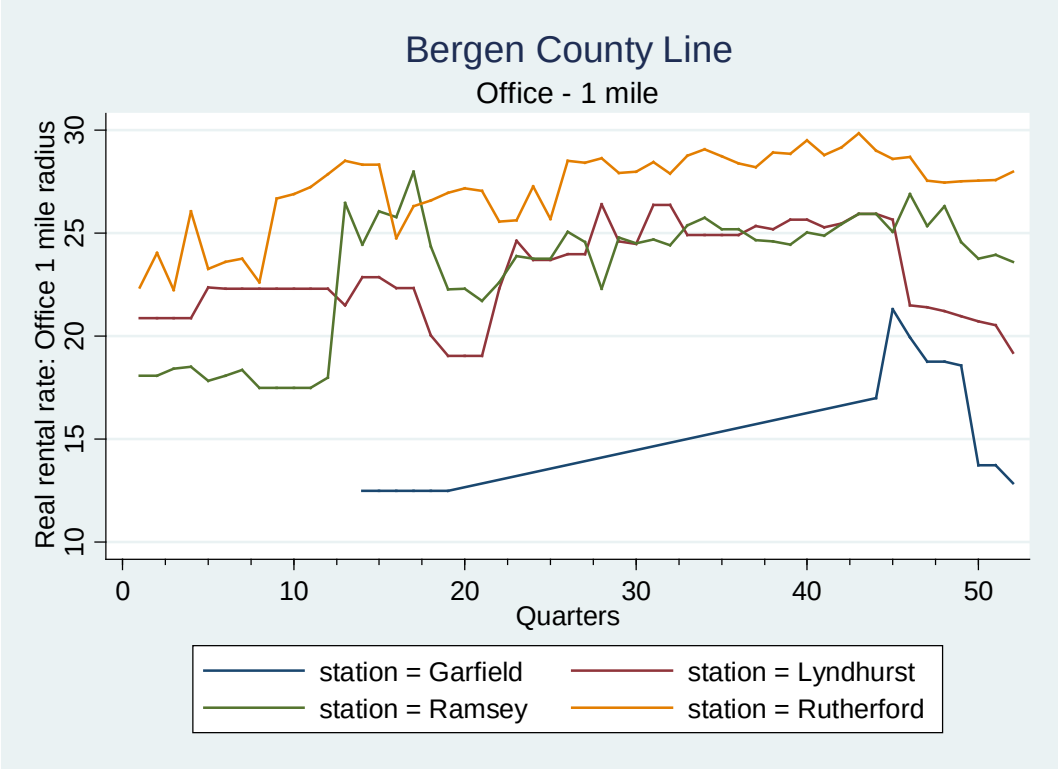
Transit village stations: Burlington City (2007), Riverside (2001)

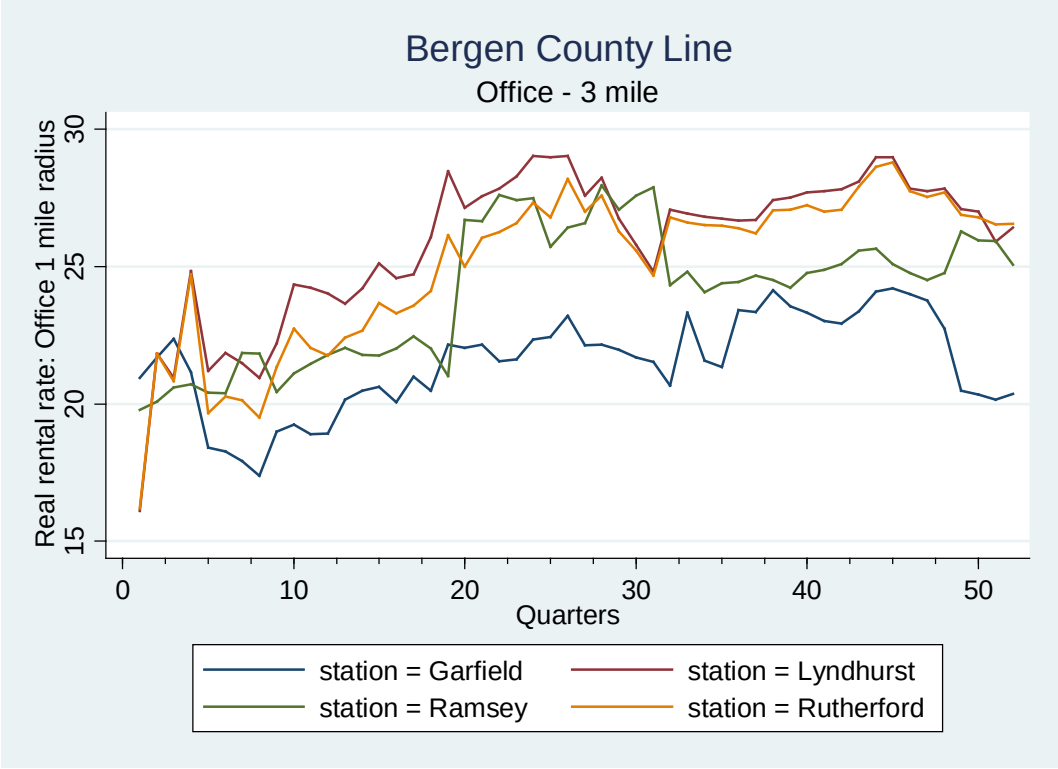
Graphs of office rental rates



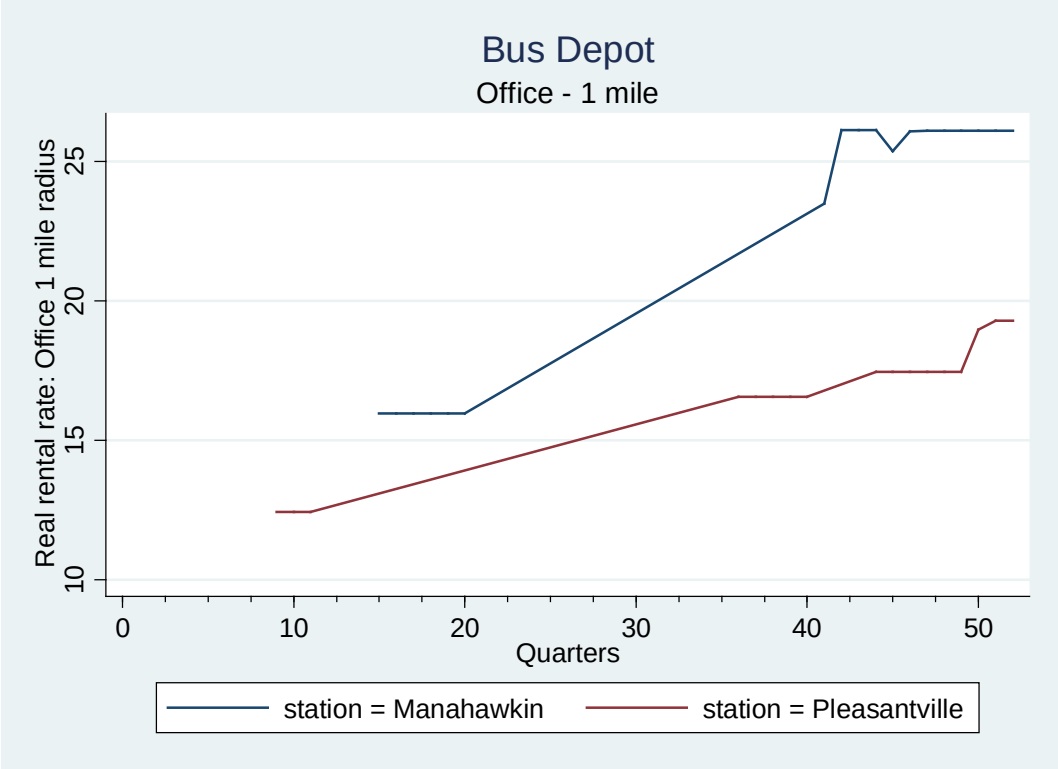


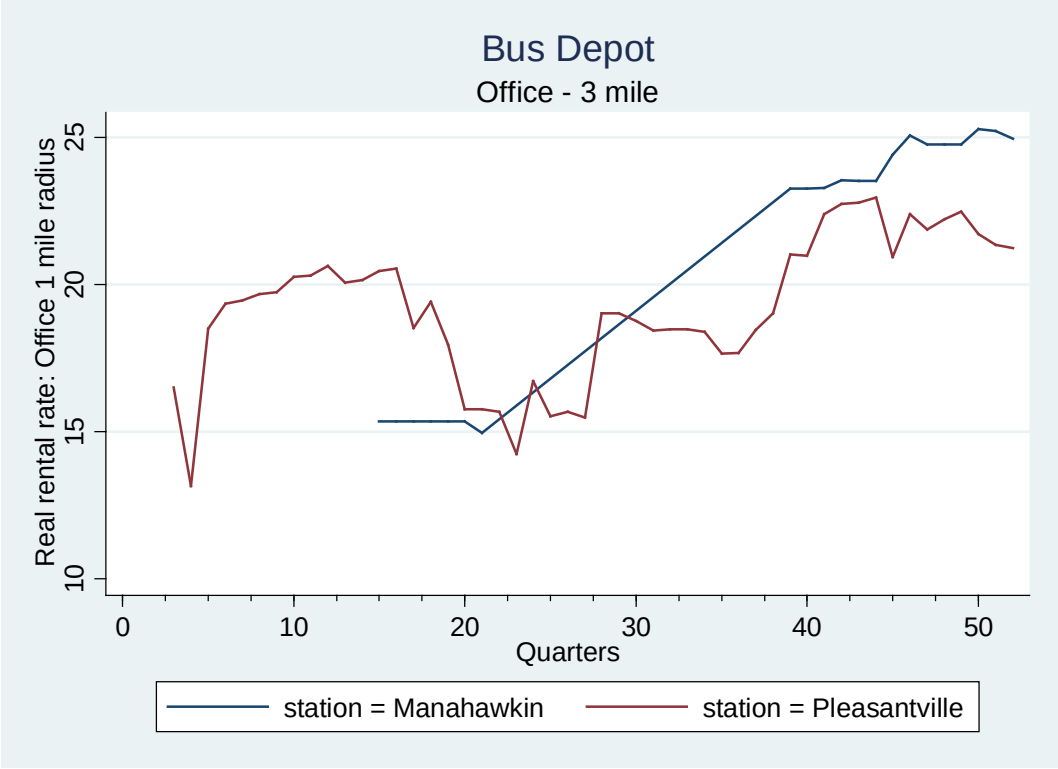
Transit village stations: Matawan (2003), Belmar (2003), South Amboy (1999)



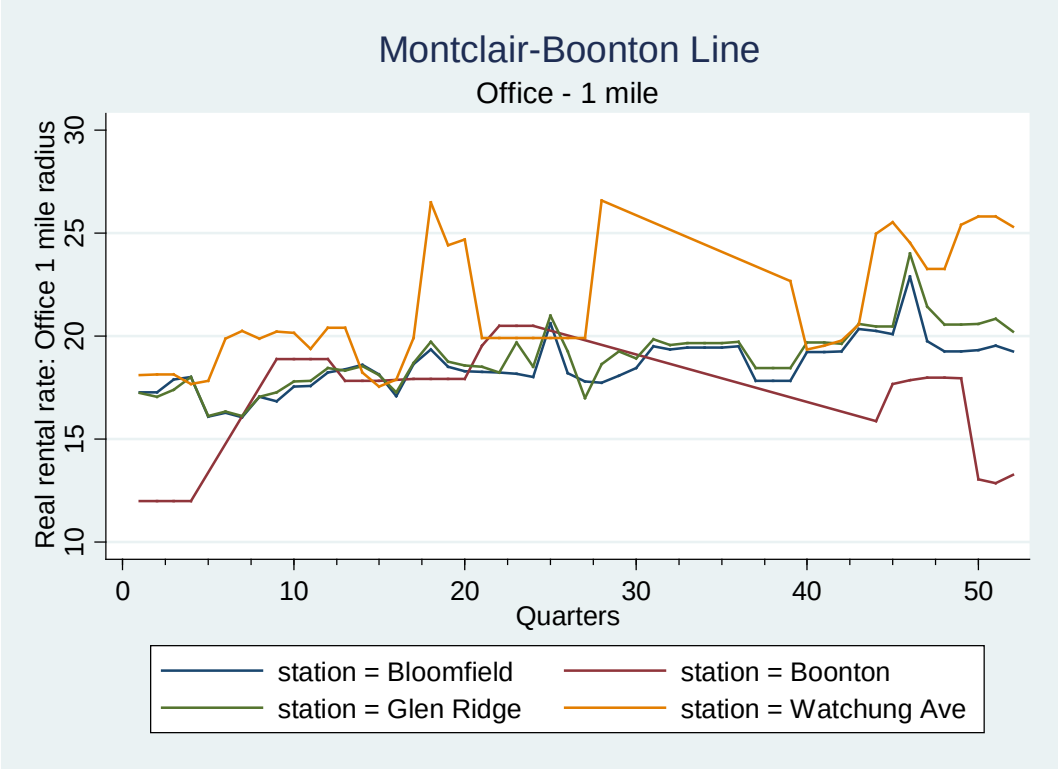


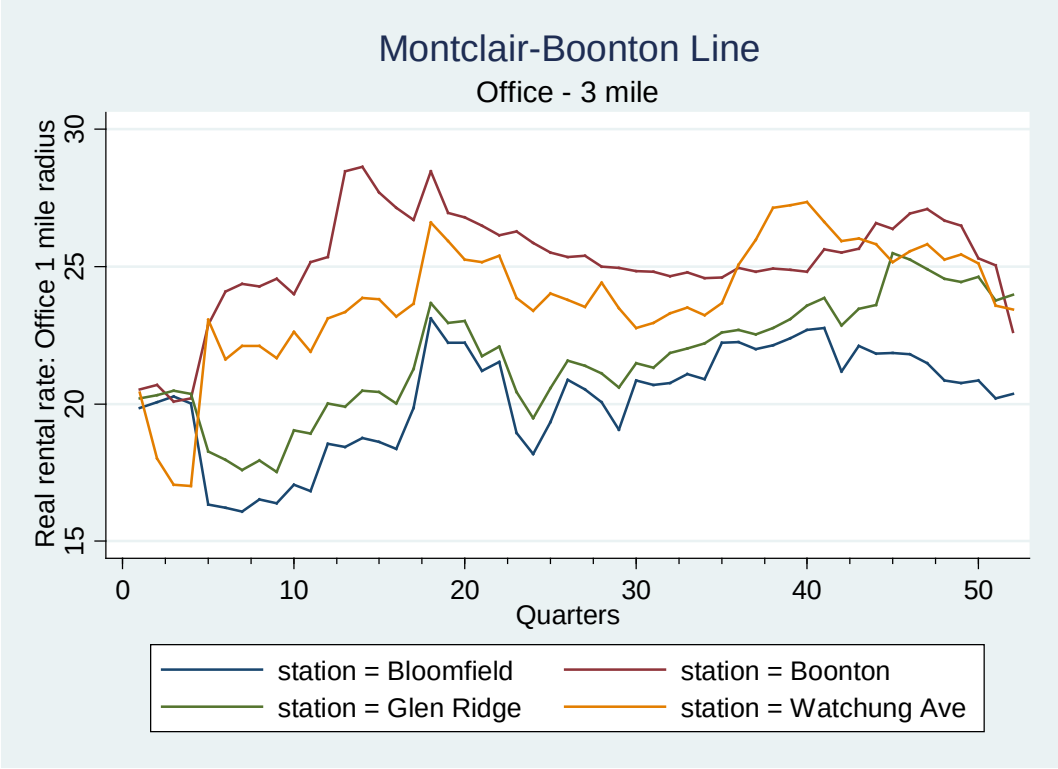
Transit village stations: Rutherford (1999)



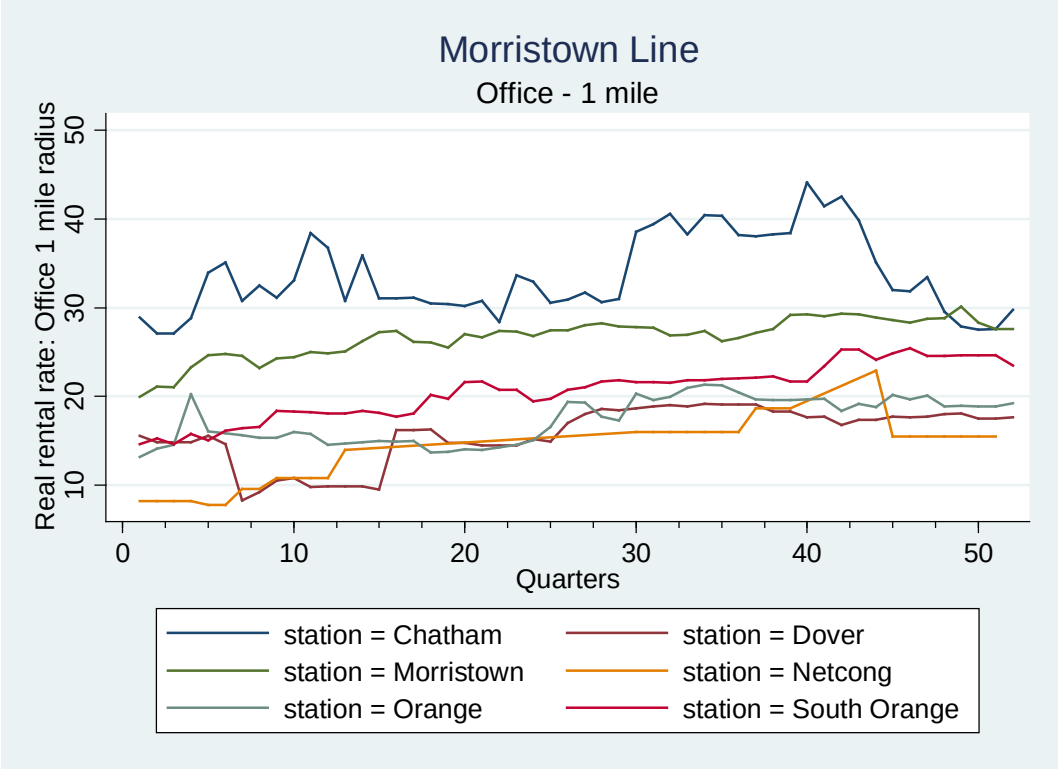


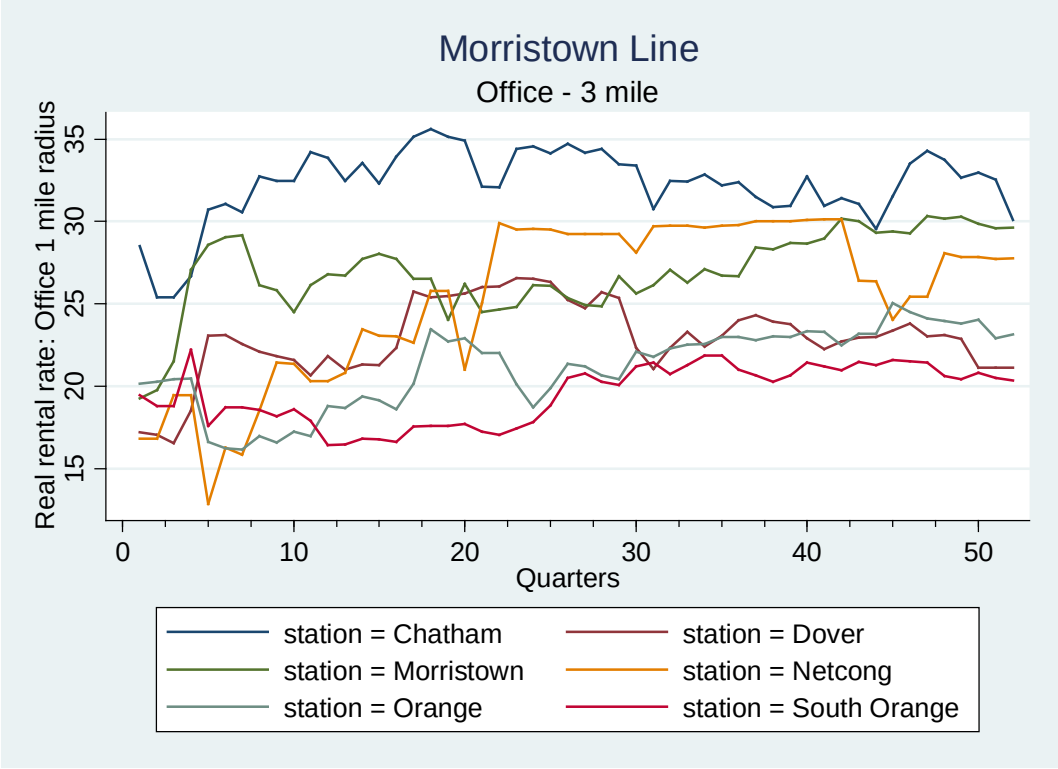
Transit village: Pleasantville (1999)



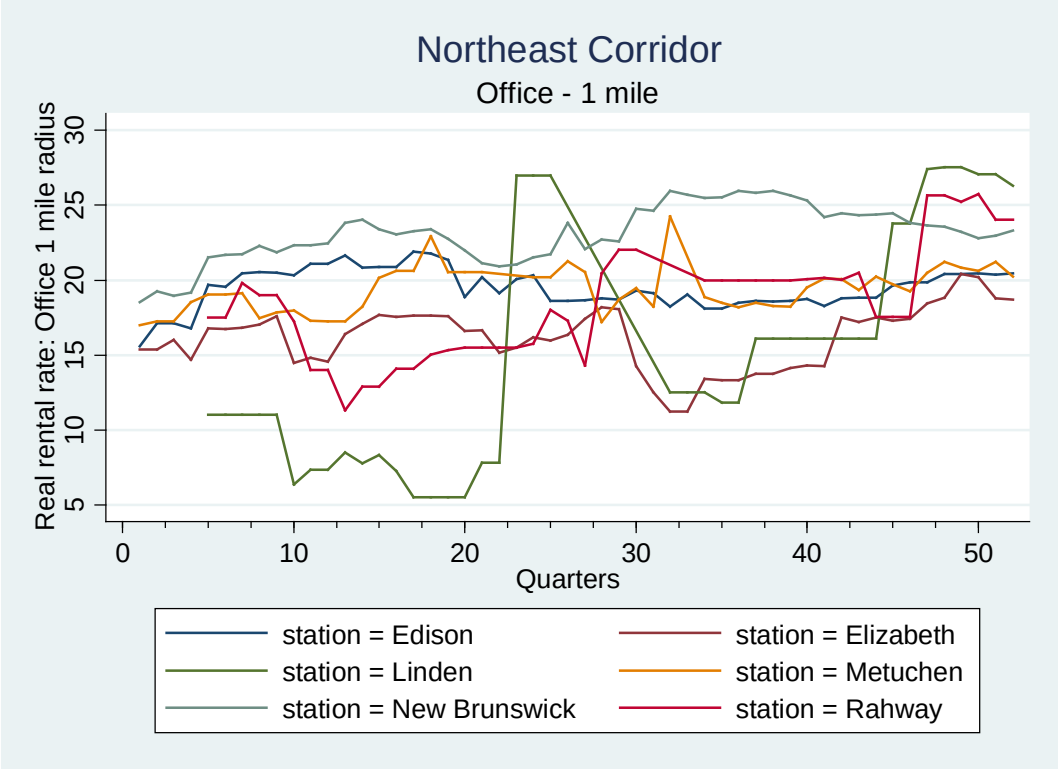


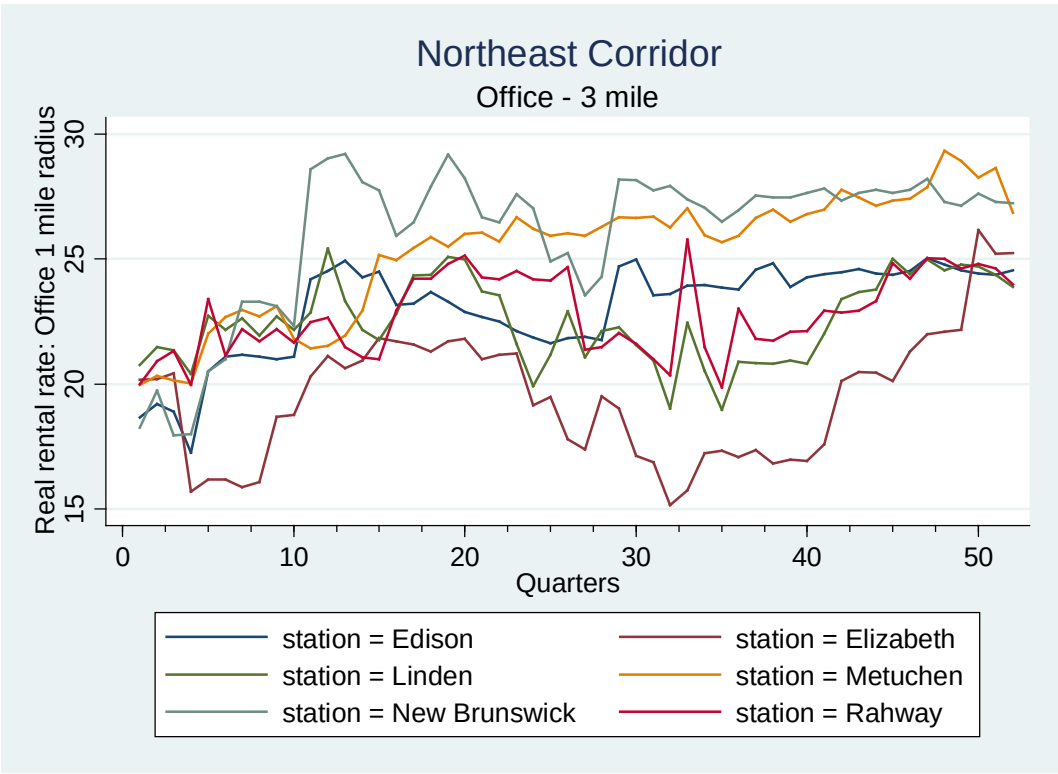
Transit village stations: Bloomfield (2003)



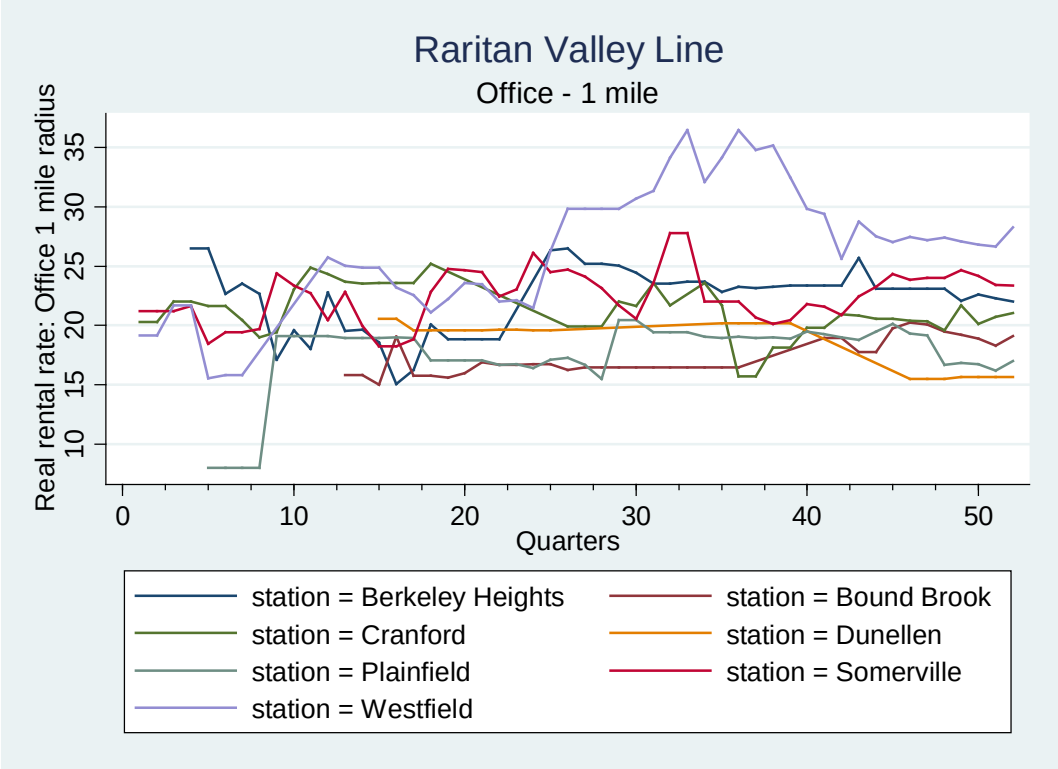


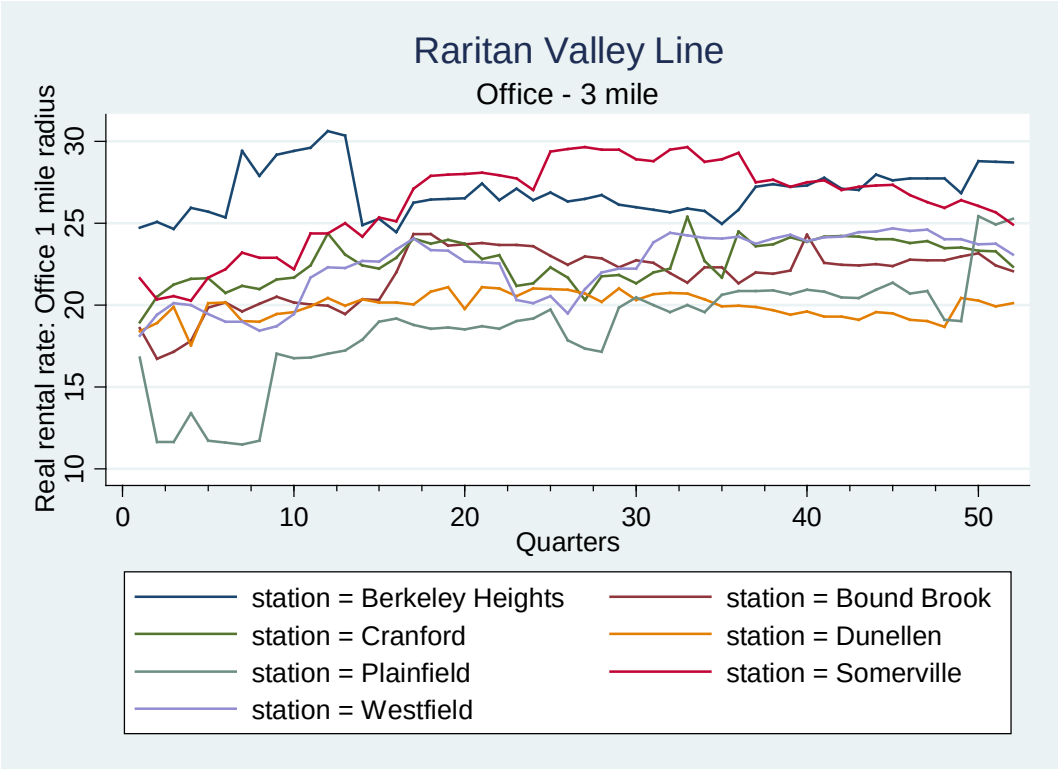
Transit village stations: Morristown (1999), Netcong (2005), Orange (2009), South Orange (1999)



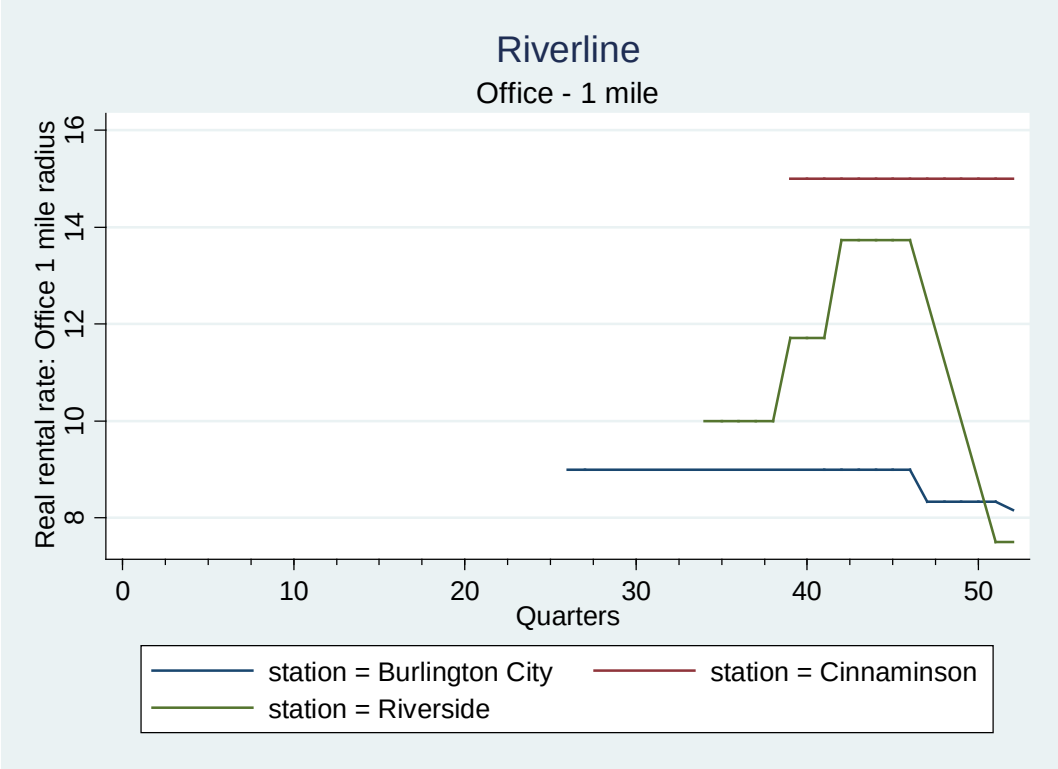


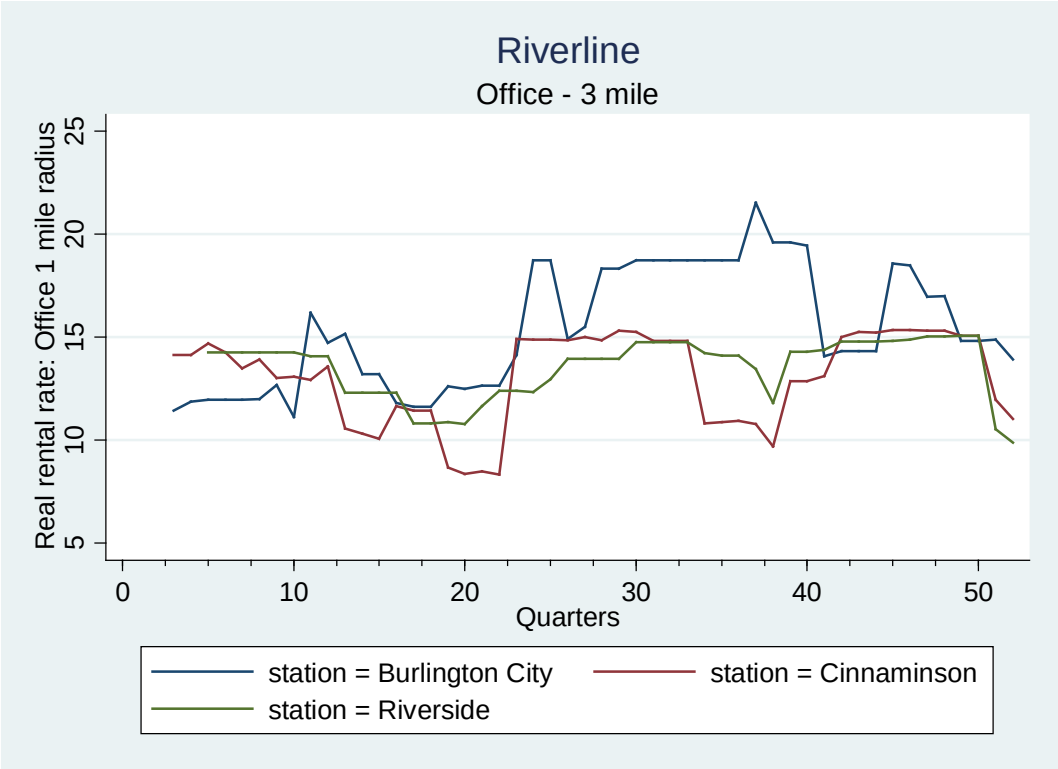
Transit village stations: Elizabeth (2007), Metuchen (2003),New Brunswick (2005), Rahway (2002)





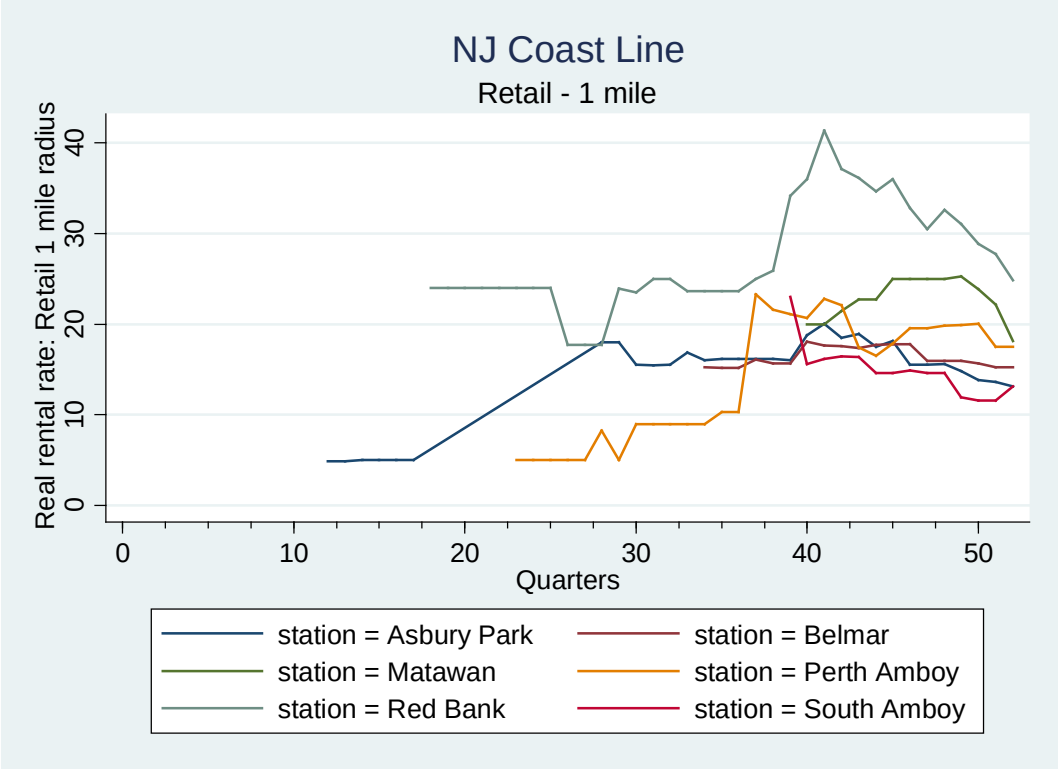
Transit village stations: Bound Brook (2003), Cranford (2003)

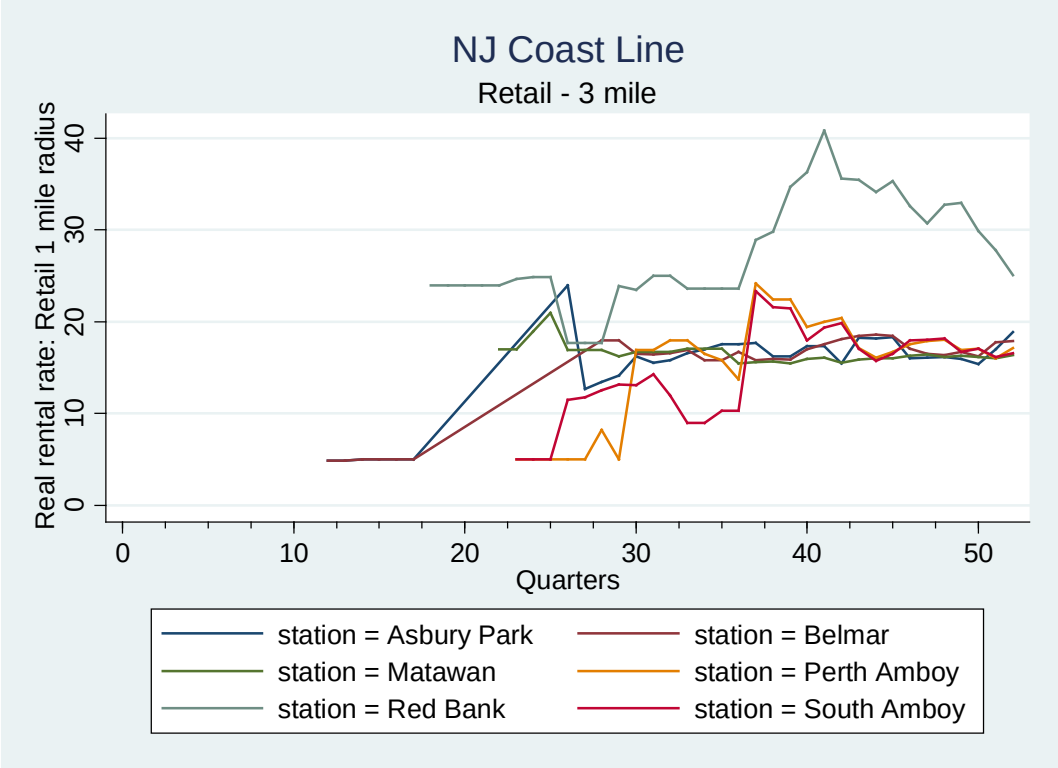




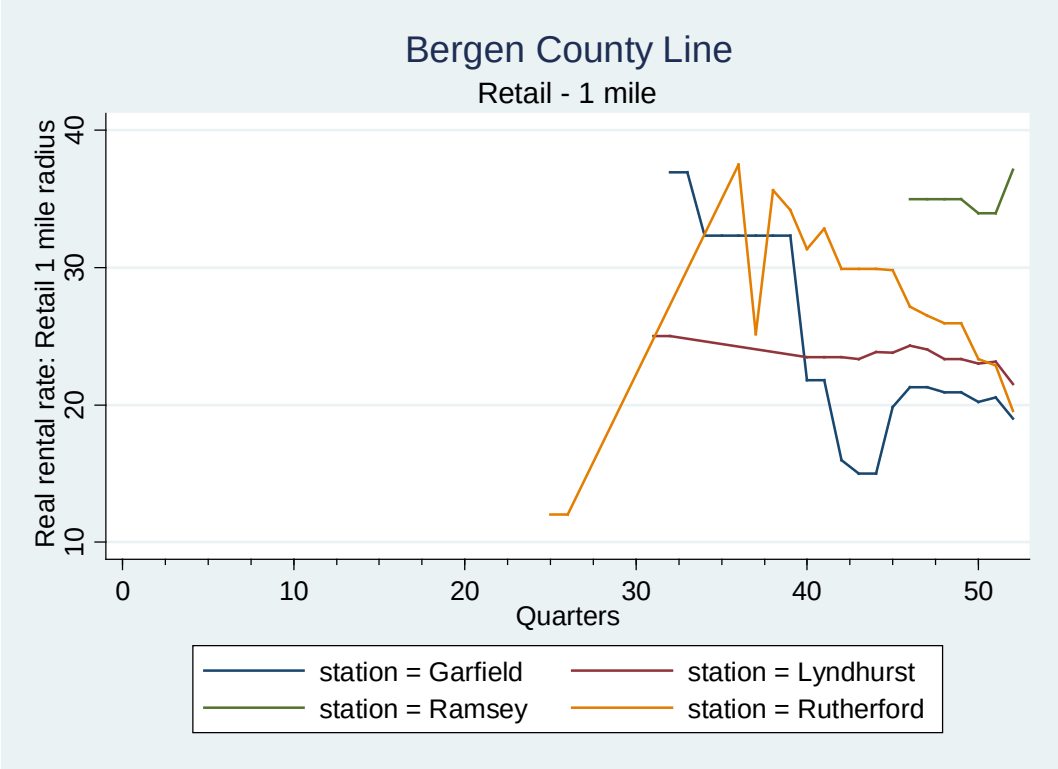
Transit village stations: Burlington City (2007), Riverside (2001)

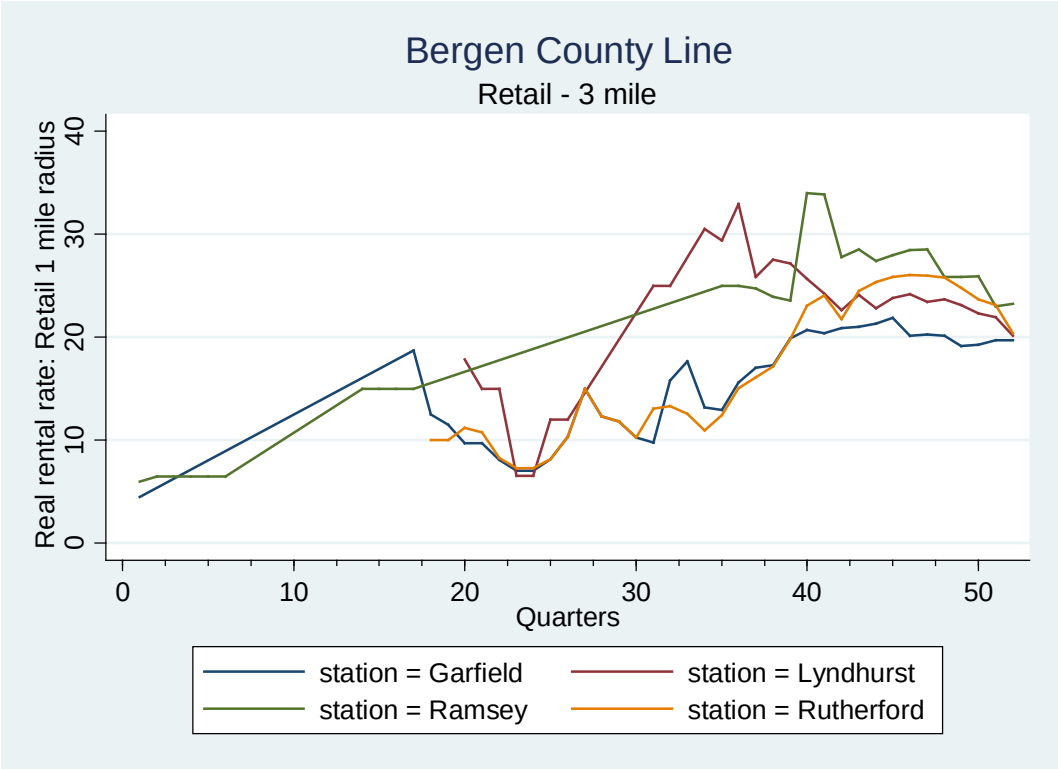
Graphs of retail rental rates



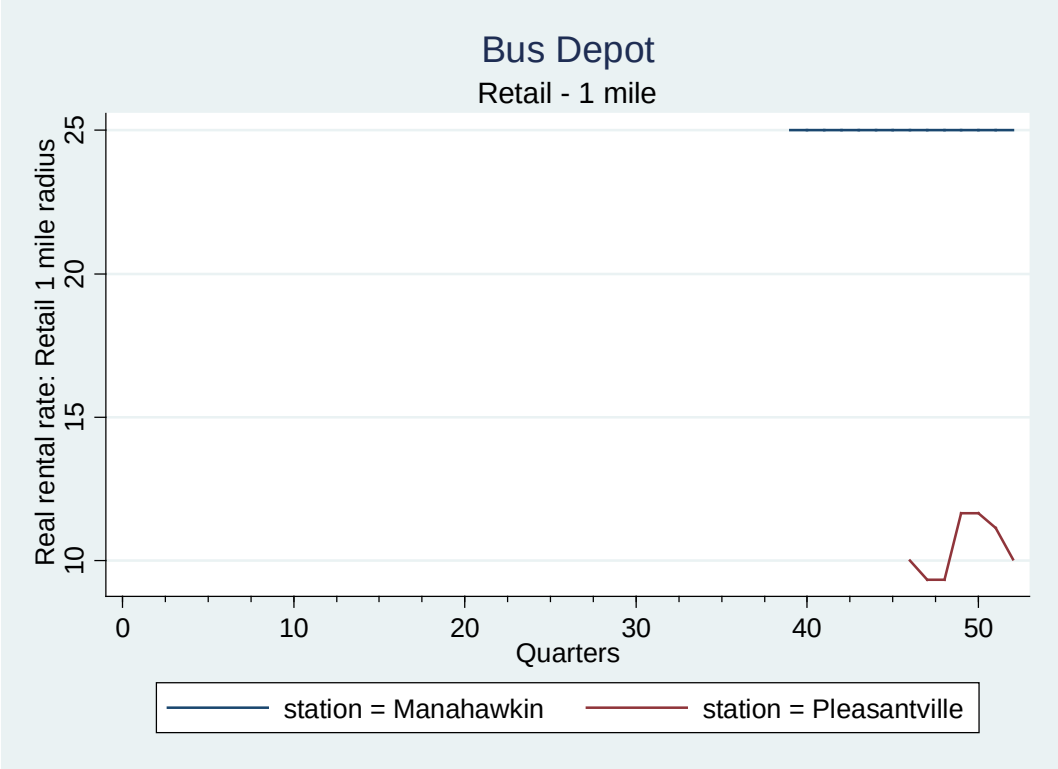


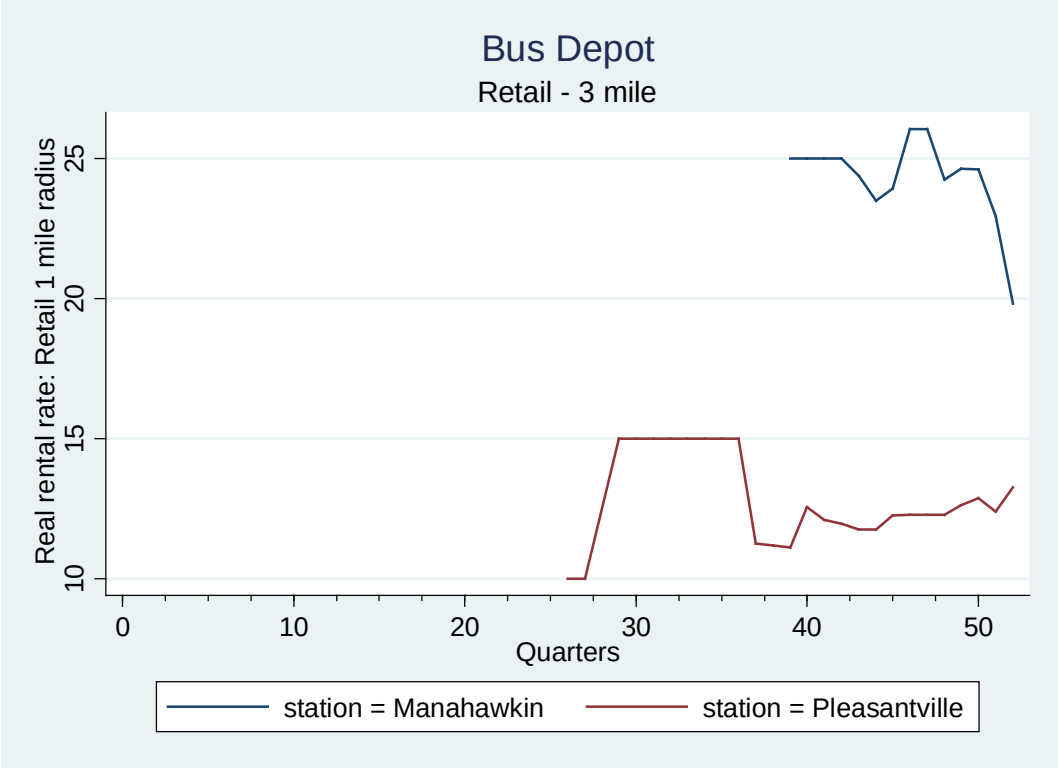
Transit village stations: Matawan (2003), Belmar (2003), South Amboy (1999)





Transit village stations: Rutherford (1999)





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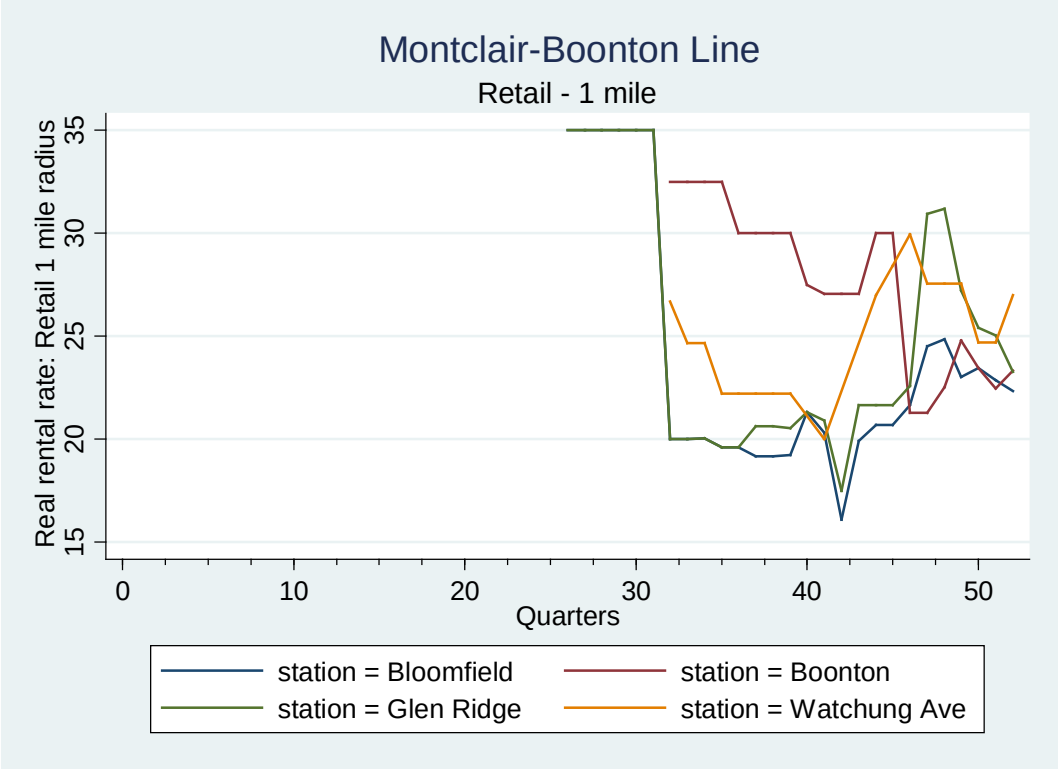

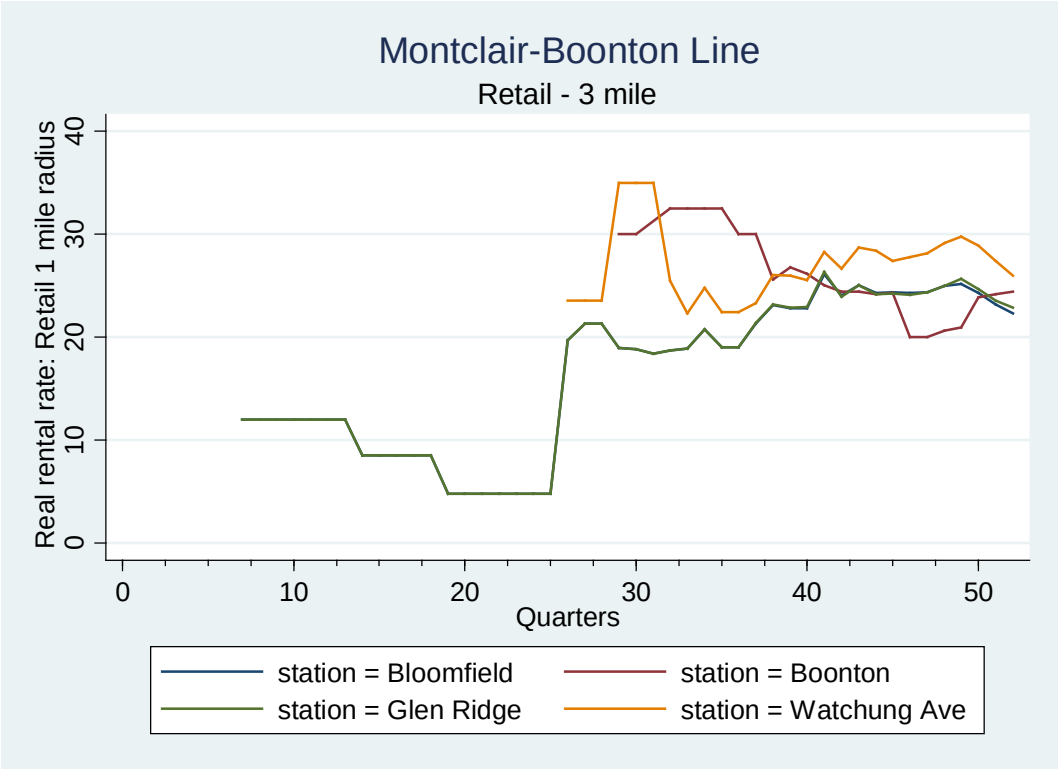

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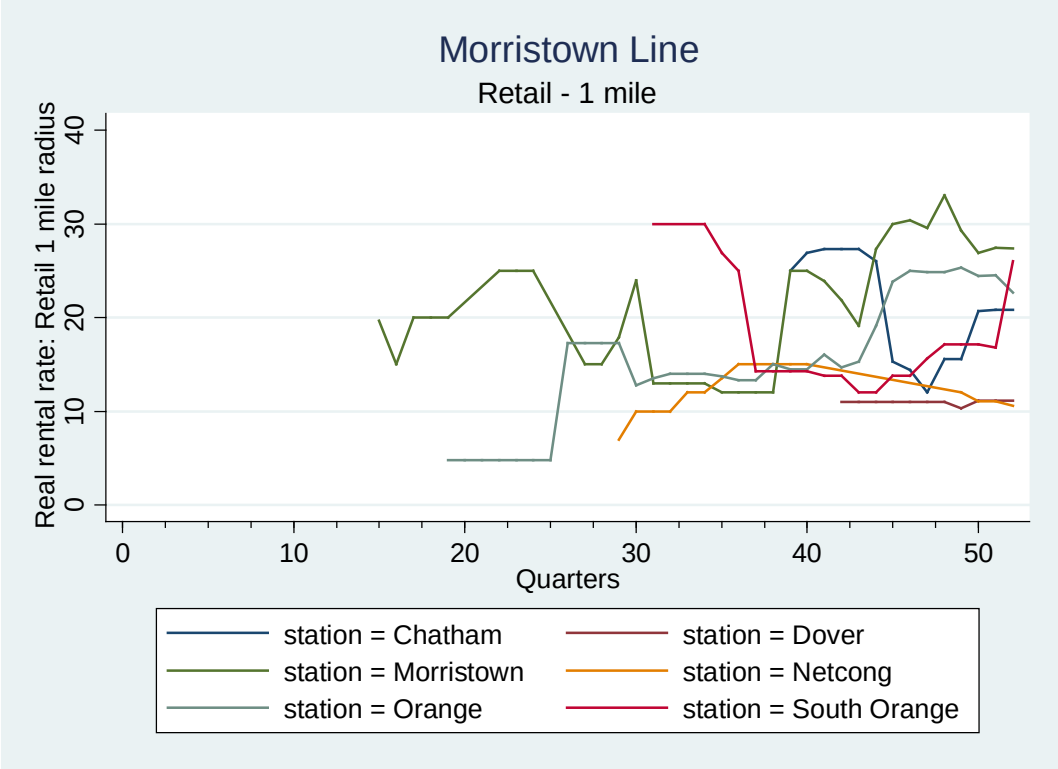
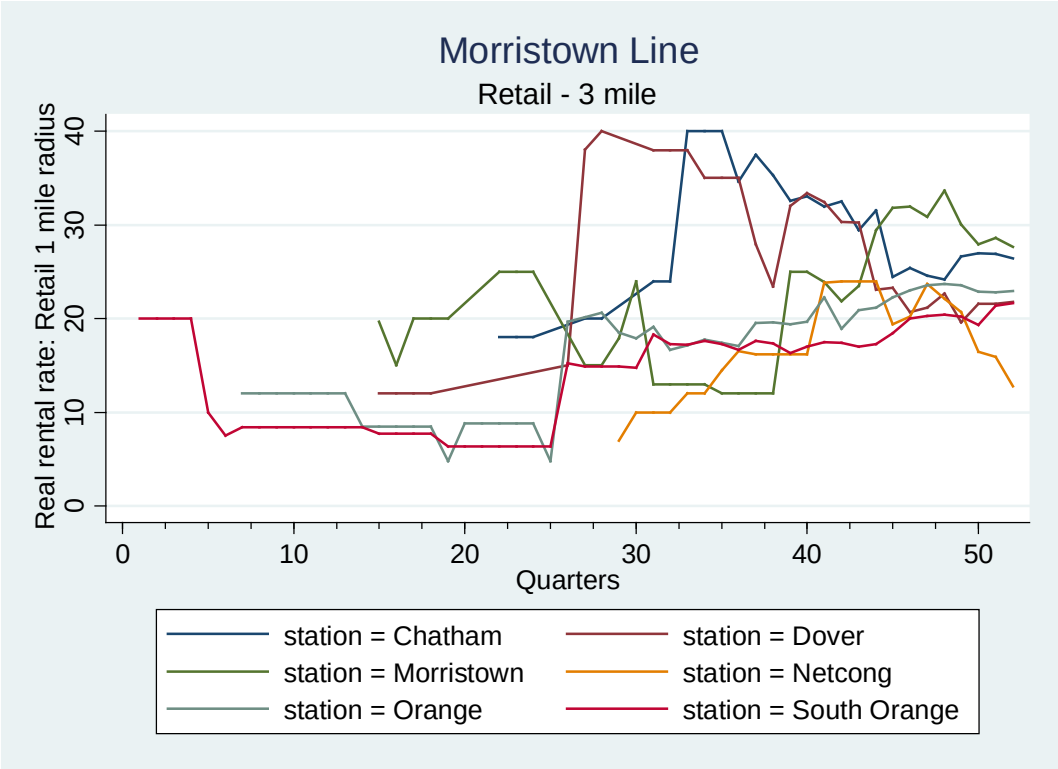
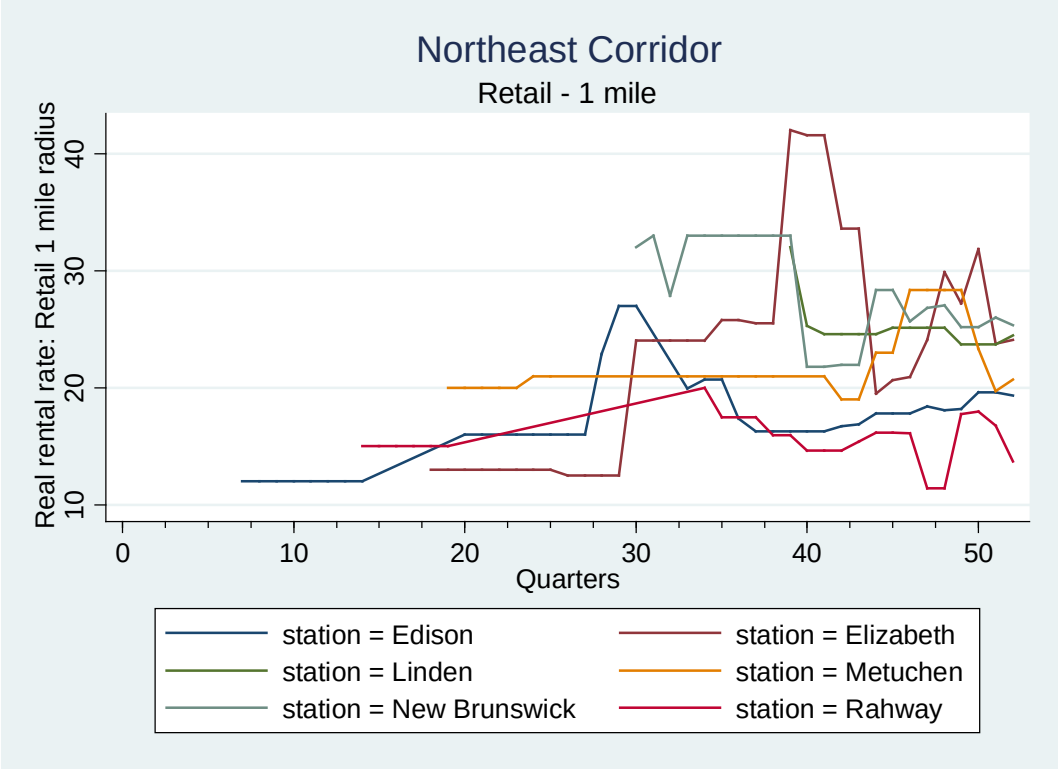
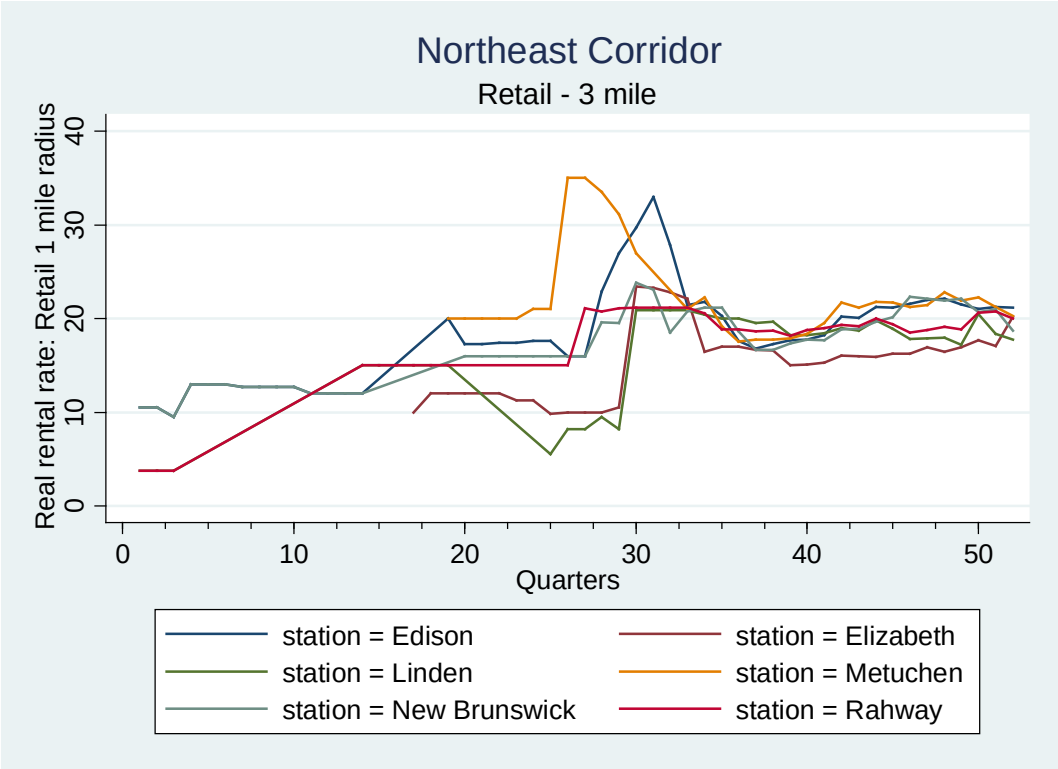


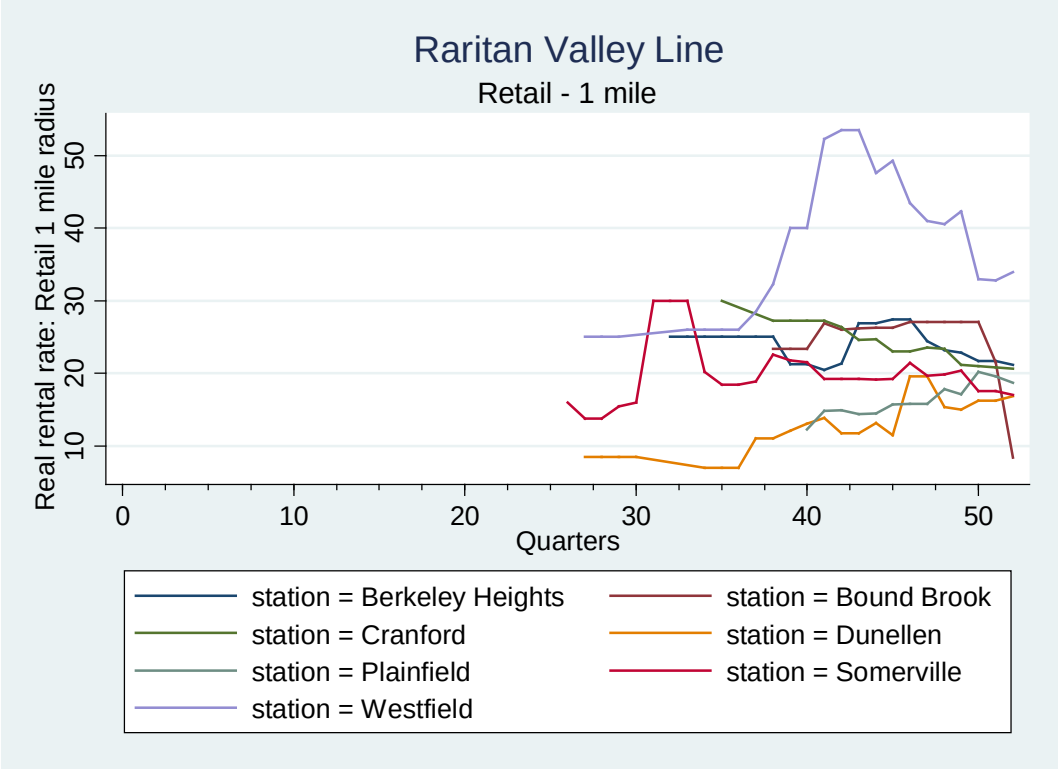


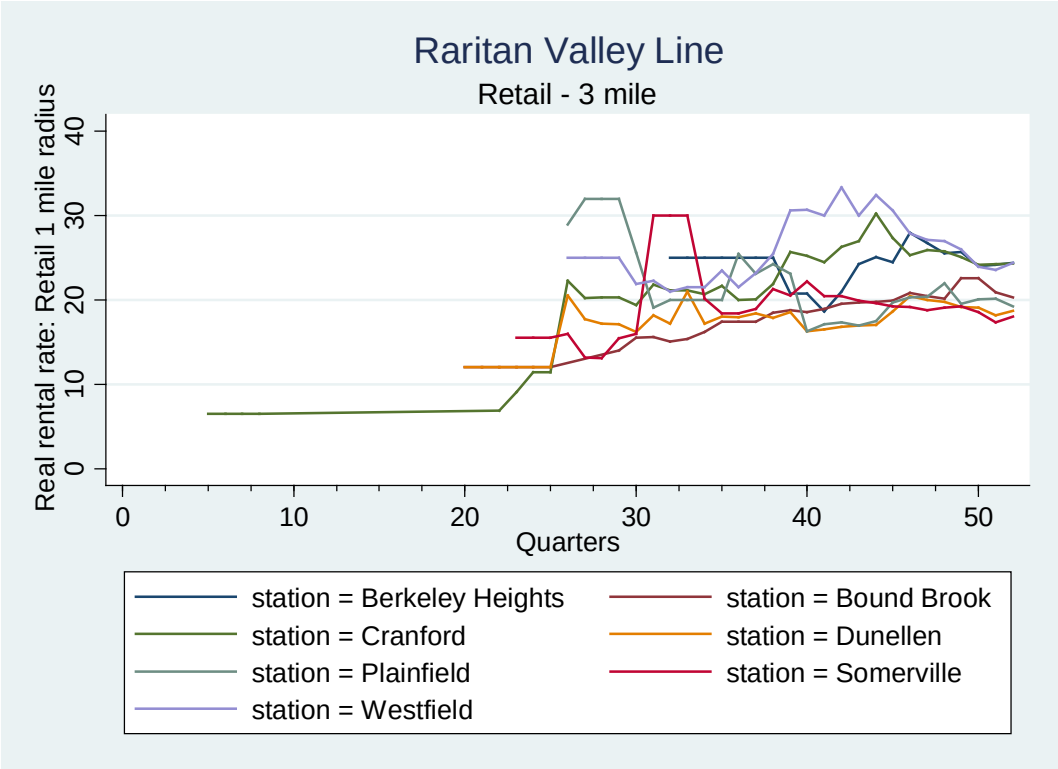
Transit village stations: Morristown (1999), Netcong (2005), Orange (2009), South Orange (1999)



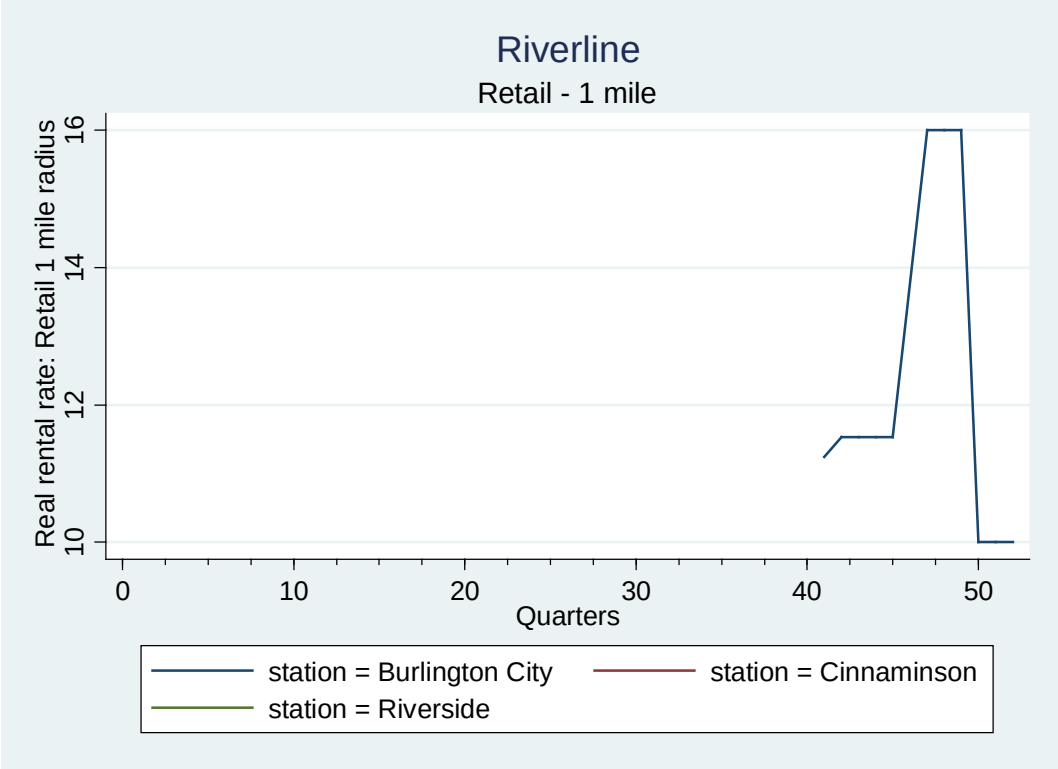


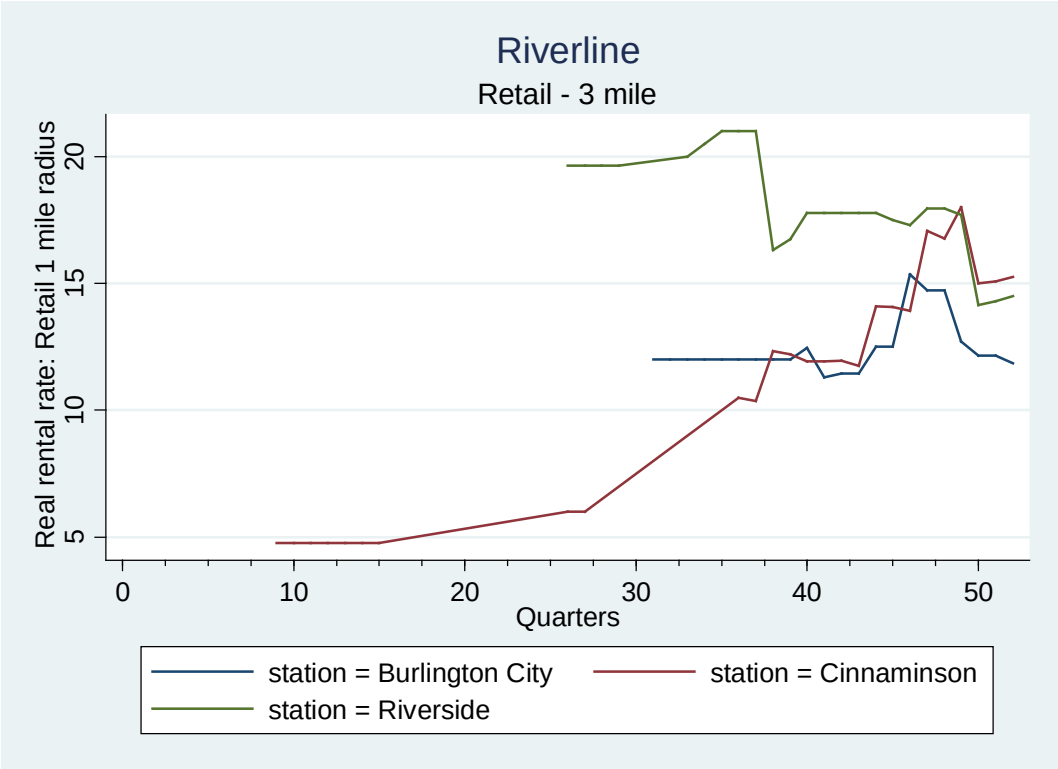
Transit village stations: Elizabeth (2007), Metuchen (2003), New Brunswick (2005), Rahway (2002)





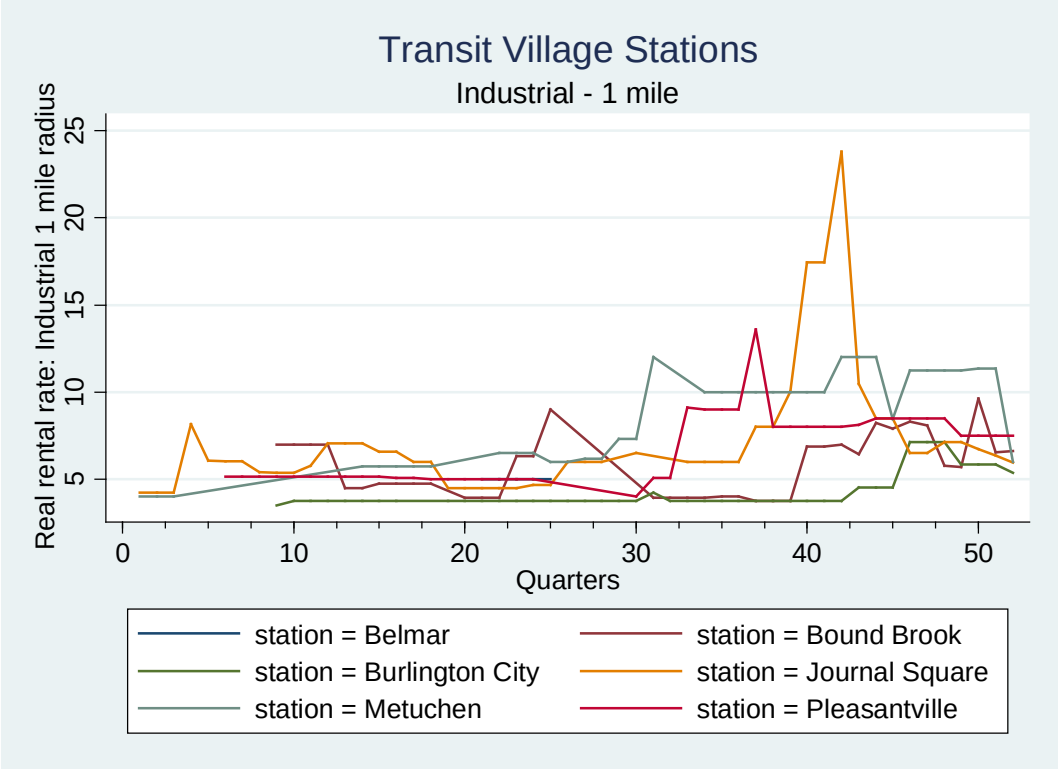
Transit village stations: Bound Brook (2003), Cranford (2003)

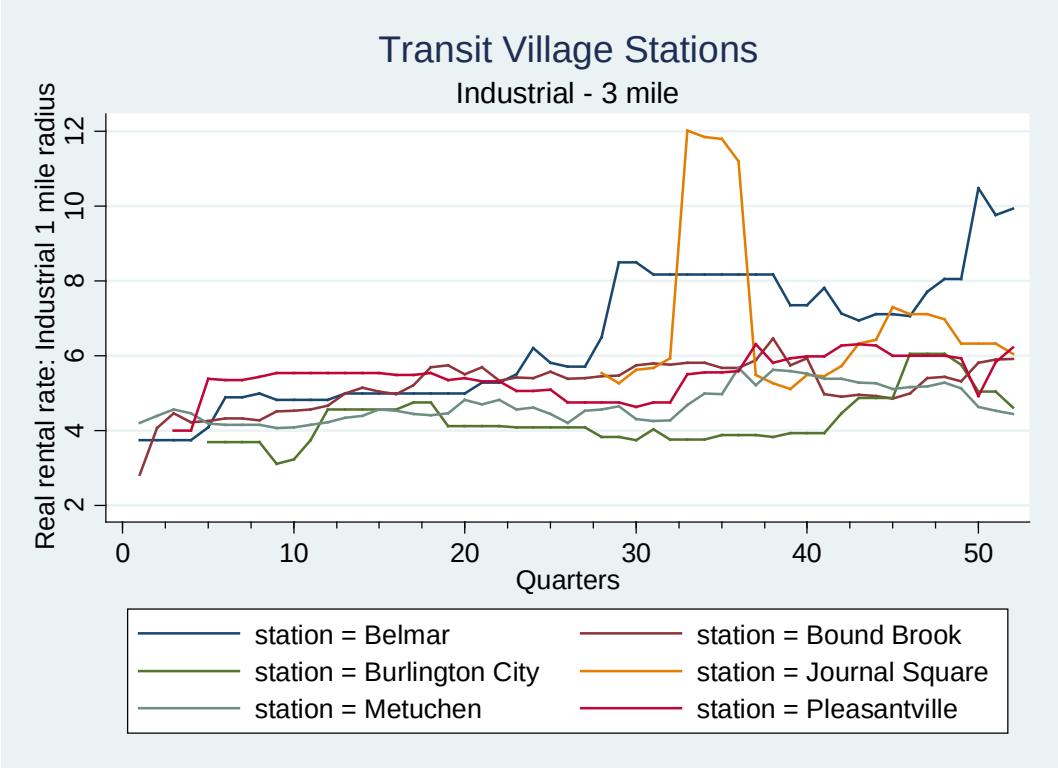




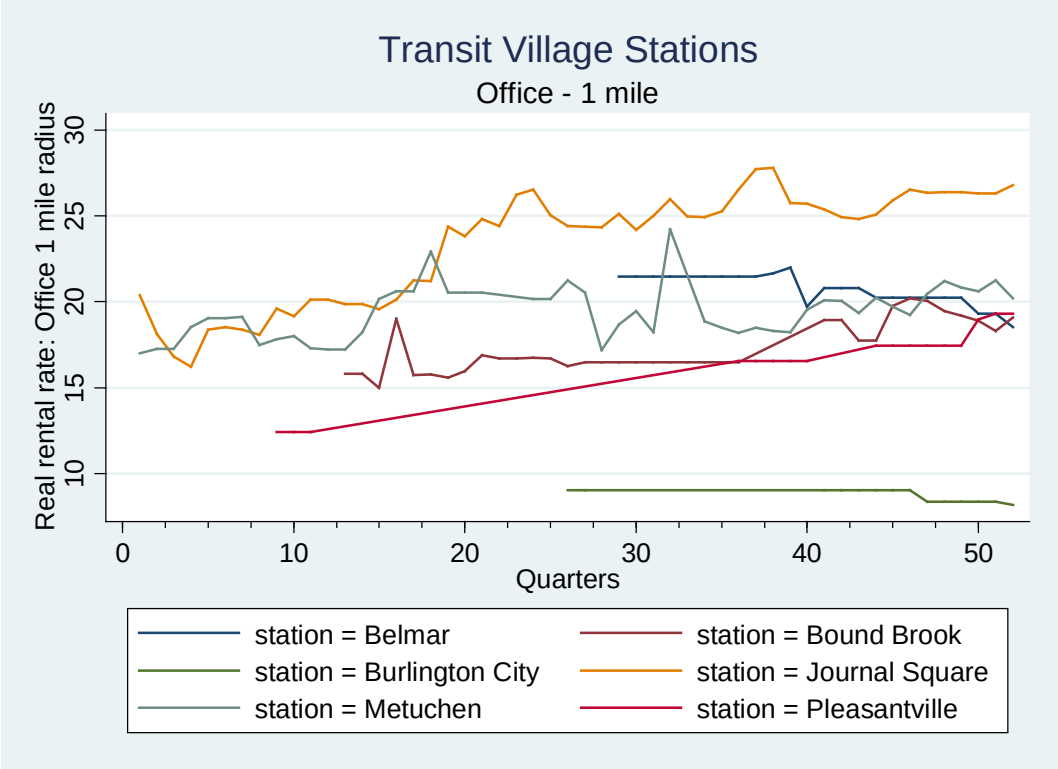
Transit village stations: Burlington City (2007), Riverside (2001)

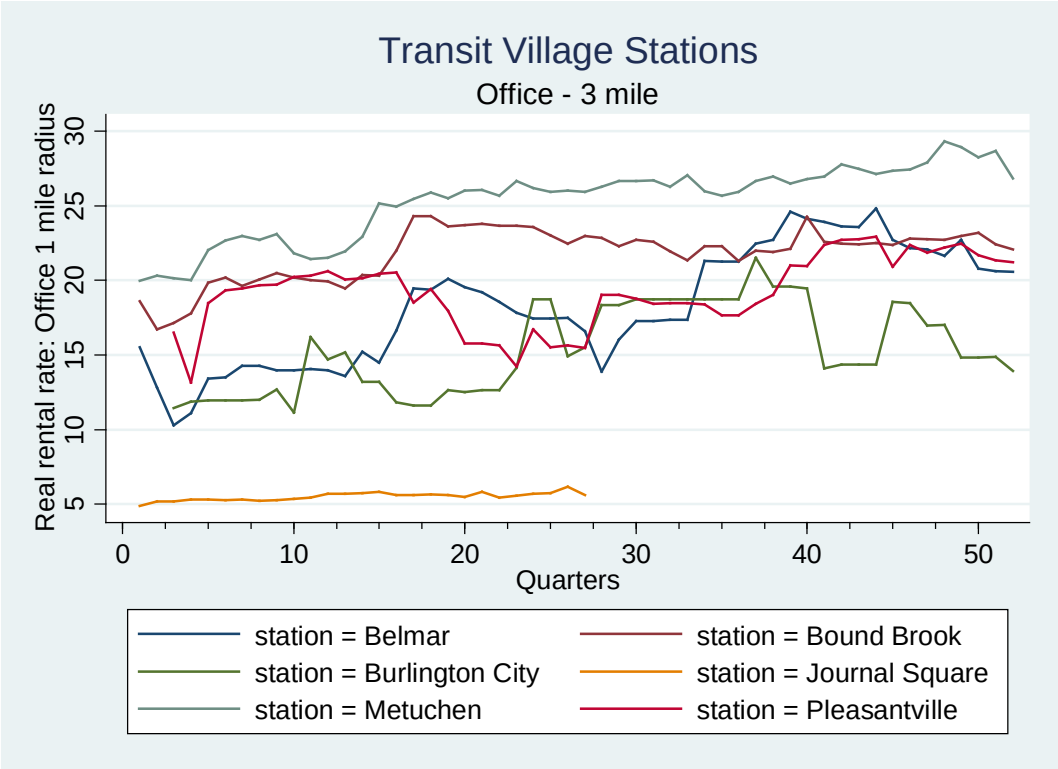
Graphs comparing case study Transit Villages



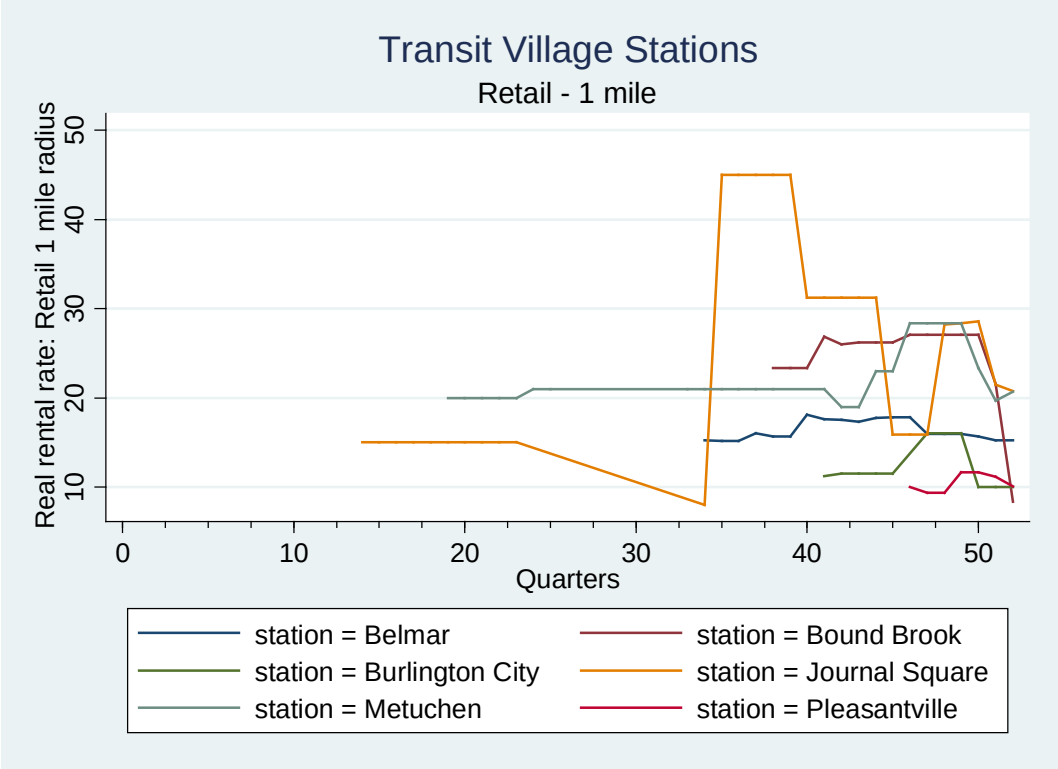


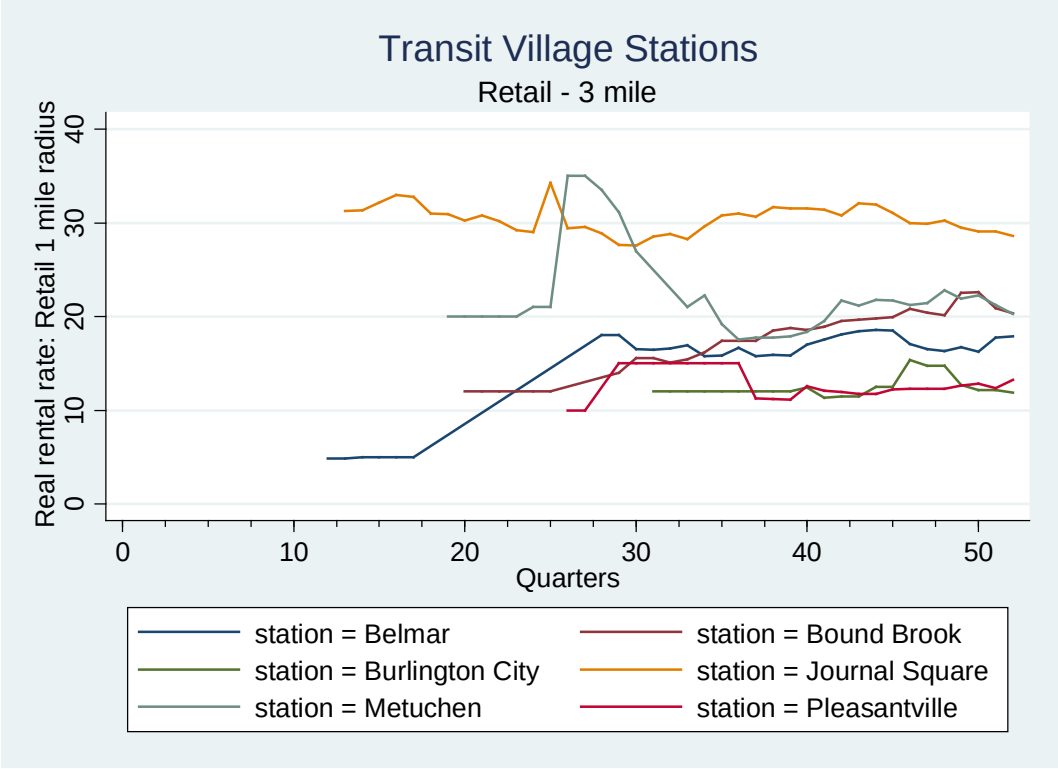
Year of Transit Village designation: Belmar (2003), Bound Brook (2003), Burlington City (2007), Journal Square (2005), Metuchen (2003), Pleasantville (1999)





Year of Transit Village designation: Belmar (2003), Bound Brook (2003), Burlington City (2007), Journal Square (2005), Metuchen (2003), Pleasantville (1999)





Year of Transit Village designation: Belmar (2003), Bound Brook (2003), Burlington City (2007), Journal Square (2005), Metuchen (2003), Pleasantville (1999)

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