Land Use Impacts of BRT: Effects of BRT Station Proximity on Property Values

Bus Rapid Transit and Transit Oriented Development Seminar
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Previous Work

- No recent quantitative modeling studies on property value impacts of BRT in the U.S.
- Previous studies address impacts of rail modes on property values
  - Isolate effect of distance from transit (either right-of-way, stations, or both)
  - Typical results find positive impacts on property values from nearby rail transit, but magnitudes are relatively small
Hypothesis & Method

• We hoped to find statistically significant, positive impacts on surrounding property values from BRT, with magnitudes approaching those found for rail transit modes.

• Estimate the impacts of BRT on surrounding property values using hedonic regression model
  – Estimate the variation in property values due to proximity to BRT stations
  – Isolate the effect of distance to nearest BRT station from all other (measurable) factors that determine property values
First Application

- **Pittsburgh East Busway**
  - Operating since 1983
  - Serves Downtown Pittsburgh, eastern communities of Pittsburgh, and eastern suburbs of Allegheny County
  - Average weekday ridership: 25,000
  - Annual ridership: 7 million
  - 9.1 miles in length
  - 9 stations
Data

• Parcel data from Allegheny County Property Assessor’s Office, 2007
• 2000 U.S. Census data, Allegheny County
• Crime data from the Pennsylvania Uniform Crime Reporting System
• Data set constructed using GIS
• Used only parcels located in between the Allegheny and Monongahela Rivers, and within one half-mile of East Busway corridor
Variables

• Dependent variable: property value (assessed value)
• Key independent variable: distance of parcel to nearest BRT station
• Other variables
  – Property characteristics
  – Neighborhood characteristics
Property Characteristics

- Lot size (sq. ft.)
- Living area (sq. ft.)
- Number of bedrooms (including interaction term with living area)
- Number of full bathrooms, number of half-baths
- Condition of property
- Age of property
- Distance to nearest BRT station (including squared term to test for nonlinearity)
- Distance to nearest LRT station
- Distance to nearest freeway entrance & distance to CBD (highly collinear with distance to LRT station; removed from model)
- Distance to freeway & BRT right-of-way
Neighborhood Characteristics

- Population density
- Median income
- Percent of minority residents
- Crime per capita (dropped due to data problems)
- Municipality fixed-effects (dummy variables)
Results

- Signs and magnitudes of most coefficients as expected
- Moving from 101 to 100 feet from a station increases market value of single-family home by $19.00
- Moving from 1,001 to 1,000 feet from a station increases market value of a single-family home by $2.73
- Magnitudes somewhat larger than expected
- Results statistically significant at the 5% level using heteroskedastic-robust standard errors
Caveats

- Results only valid for Pittsburgh’s East Busway corridor using these data
- Magnitude of key coefficient (distance to BRT station) is larger than expected
- Spatial autocorrelation may be introducing bias to the key coefficient
  - Not able to correct for spatial autocorrelation in this effort
- Multi-family residences and commercial properties not examined
- Due to data limitations, a cross-section (one point in time) analysis was employed
  - Ideally, a before-and-after scenario would be used
Coming Work

- Address caveats discussed previously
- Refine method and apply to other cities
  - Boston
  - Cleveland
  - Los Angeles
  - Eugene…
Policies and Potential Impacts on BRT and Development

- Understanding the relationship between land use & BRT
- Question of incentives offered in cities where BRT and LRT operate
- Report on land use policies that may impact development around BRT and/or other transit modes
Cleveland – Euclid Corridor

- Over $4 billion in investment
- Retail, residential, office
Ottawa

• $700 million in development around stations
• Retail, office, residential
Boston – Washington Street

- Over $650 million
- Retail, residential, office, health
Boston Seaport

• Fan Pier, Courthouse, World Trade Center
• Retail, residential, office, health
Pittsburgh

- Over $500 million
- Commercial, residential, office, medical, recreational
## MLK, Jr. East Busway (Pittsburgh)

<table>
<thead>
<tr>
<th>Community</th>
<th>Type of Development</th>
<th>Type of use</th>
<th>New Construction or Redevelopment</th>
<th>Value of Investment</th>
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<tbody>
<tr>
<td>Wilkinsburg</td>
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<td>New</td>
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<td>Bank*</td>
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<td>Convenience Store*</td>
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<td>Drug Store*</td>
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<td>Fast food restaurants (4)*</td>
<td>Retail</td>
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<td>Hospital*</td>
<td>Medical</td>
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<td>Homewood</td>
<td>Community College*</td>
<td>Institutional</td>
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<td>Farmers Market*</td>
<td>Retail</td>
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<td></td>
<td>Single family residence*</td>
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<td></td>
<td>Single family residences*</td>
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<td>Research and Engineering offices</td>
<td>Office</td>
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<td>University offices</td>
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<td>East Liberty</td>
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<td>Shopping center</td>
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<td>Recreation</td>
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<td>Organization Headquarters*</td>
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<td>Painters Store*</td>
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<td>Shopping center (8 tenants)*</td>
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<td>New</td>
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<td>Theatre and shops*</td>
<td>Theatre/retail</td>
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<td>Apartments</td>
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<tr>
<td></td>
<td>Hospital, Medical offices, parking garage</td>
<td>Medical/parking</td>
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<td>Offices</td>
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<tr>
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<td>Offices</td>
<td>Office</td>
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<td>$200,000</td>
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</tbody>
</table>

* Development clustered at the stations
Any of these may provide incentive or disincentive for new developments or concentration of ongoing development along transit corridors.

- Local land use plans, policies, zoning, and capital improvement programs
- Financial and non-financial incentives (e.g., density bonuses, tax incentives, streamlined development application process, loan support etc.)
- Structure of tax revenues for local jurisdictions
- Experience of the transit agency and other local institutions
Policies

- Ottawa, ON
- Boston, MA
- Los Angeles, CA
- Baltimore, MD
- New York, NY
- Pittsburgh, PA
Ottawa Policies

- Greenbelt
  - Development occurring within certain areas
- Restrictions on future developments
  - Regional Official Plan
  - Parking limits
Boston Policies

• Boston (Boston Redevelopment Authority)
  – site acquisition, low-interest loans, joint development opportunities, multi-agency coordination, neighborhood visioning, grants, and streetscape improvements
  – Encourages developers to make projects pedestrian-friendly, mixed-use, and use minimal parking
  – Does not require these or other design standards to be met in order to receive the assistance that it offers

• Boston Agreements with EPA
  – Boston was allowed to freeze its parking requirements at the 1973 level plus 10 percent, which includes all general parking in Boston proper
Los Angeles, CA

- Metro Rail, Metro Orange Line, Metro Rapid
  - Specifically focused on Orange Line
- Local jurisdictions and Metro helped create supportive land use policies and joint development agreements
  - City of Los Angeles (incentive measures), County of Los Angeles (combine incentives with development standards)
- 1993 City of Los Angeles Land Use and Transportation Policy was adopted
  - Created a series of incentives to projects within ¼ mile of transit stations
Los Angeles, CA

- City also asks for local contribution toward construction cost of any fixed guideway transit
  - Target is three percent of total cost
- Metro provided supplementary zoning regulations for transit stations along the Blue Line
- 1992 Pacific Court Project – Redevelopment Agency program to reintroduce housing to Long Beach
  - Unintentional effort by Metro and city to encourage TOD
  - Financing incentives (wrote down cost of land and tax-exempting financing)
• Light Rail, BRT
• Port Authority of Allegheny County (PAT) has not established any local, county, regional policies for TOD
  – Development occurring informal basis based on interest and public involvement
Pittsburgh, PA

• 2004 Pennsylvania Legislature
  – Allow local governments to create Transit Revitalization Investment Districts (TRID)
  – Lay the groundwork for TODs
  – No difference between rail and BRT
Baltimore, MD

- Light rail, Metro Subway, Commuter Bus, and MARC Train
- Had proposed 10.5 mile BRT route
- MDOT aggressively promotes TOD
  - Promote efficient and sustainable growth
- Maryland Base Realignment Zones (BRAC)
  - Local governments to provide state financing support for public infrastructure to these zones – for rail
New York, NY

- Extensive transit system
  - Five designated BRT corridors
- Incentives for development not specific toward mode
  - Limited ROW
- Blue Ribbon Commission on Sustainability of MTA ("green" focus)
  - Controlling growth by utilizing TODs
    - Two thirds of new development within ¼ to ½ mile of bus and subway stops
- Parking limits
- Ongoing efforts to update zoning by considering travel behaviors/patterns within areas