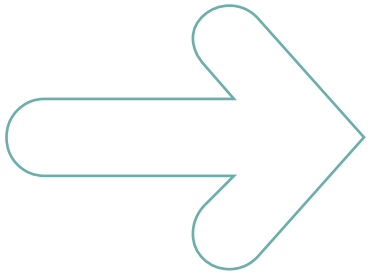
The ARC Effect

Appendices

How better transit boosts home values & local economies



A Report by
Regional Plan Association
July 2010

The ARC Effect:

How better transit boosts home values and local economies

Executive Summary

A statistical analysis of the effect of three recent improvements to NJ TRANSIT's rail system on home values predicts that ARC – a new commuter rail tunnel to Midtown Manhattan – could add a cumulative $18 billion to home values within two miles of NJ TRANSIT and Metro-North Port Jervis and Pascack Valley train stations. This, of course, is just one of ARC's several long-term economic benefits, which also include an overall increase in the region's economy, new jobs on both sides of the Hudson, higher personal incomes, higher commercial property values, and reductions in driving and air pollution.

Hedonic price modeling of 45,000 home sales within two miles of train stations shows that three improvements to the NJ TRANSIT rail system – Midtown Direct Service on the Morris & Essex Line, the Montclair Connection for the Montclair-Boonton Line and Secaucus Junction for the Pascack Valley and Main/Bergen/Port Jervis Lines – increased the value of nearby homes by an average of nearly $23,000 per home (in 2009 dollars). Homes within walking distance of train stations gained the most value – up to $34,000. Value appreciations were less significant farther from stations.

Cumulatively, these three projects boosted home values by $11 billion. This represents $250 million a year in new property tax revenue for municipalities.

- A detailed comparison of the trip time reductions provided by these three projects with the trip time reductions expected from ARC reveals that **ARC could raise home values by an average of $19,000 per home**, and up to $29,000 for homes within one-half mile of stations.

- **Cumulatively, ARC could boost home values by $18 billion**, and generate $375 million a year in new property tax revenue for municipalities. This is significant as growing tax bases relieve pressure for municipalities to increase tax rates.

- **The number of residents west of the Hudson River with a train commute to Midtown of under 50 minutes will double after ARC**, thanks to faster commuting times. The number of people within 70 minutes of Midtown will increase by 25%. This extraordinary improvement in access will have significant positive economic impacts for families and municipalities across New Jersey and New York, as wages are 60% higher in Manhattan than west of the Hudson.

- **The economic development and quality-of-life-improving potential of better transit can best be harnessed by building new, transit-oriented, mixed-use, economically diverse development around train stations.** NJ TRANSIT, Metro-North, municipalities, and the state of New York and New Jersey should work together to optimize ARC's benefits for the most residents possible.

Download the full report at www.rpa.org

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Appendix A: Relevant studies

Theoretical claims about transit and property values

In theory, proximity to light-rail or heavy-rail transit stations may have positive or negative impacts on residential property values. On one hand, improved access to the region's commercial center reduces transportation costs – in terms of either money or time – and therefore increases the amount of money available for other living expenses. All else being equal, activities should shift toward rail station areas, and this should translate into increased property values (Huang 1996).

On the other hand, rail stations often come with noise, congestion, vibration, pollution and visual impacts that can reduce sales values for nearby properties. Furthermore, some have argued that improved accessibility does not, in fact, concentrate growth, but disperses it. Meyer and Gómez-Ibáñez, for instance, suggest that improved rail lines or highways may disperse growth because faster, more convenient transportation allows commuters to move farther out from the CBD without increasing overall travel time (Meyer and Gómez-Ibáñez 1981). In addition, it could be argued that in most urban areas, where there is a dense network of highways and roads and where a large proportion of workers do not commute to "downtown," new rail lines represent only a marginal improvement in overall transportation accessibility. In this environment, rail improvements may lead to only marginal increases in real estate values (Huang 1996).

Empirical claims

Most empirical studies find that access to rail transit has a positive impact on property values, especially within close proximity to the stations. In 1995, John Landis and Robert Cervero found that houses immediately adjacent to San Francisco's BART sold for nearly 38% more than identical houses in areas not served by BART (Landis and Cervero 1995). In a separate study, Cervero found that BART also increased rent values. The rent premium for being within one-quarter mile of a station was $34 a month (Cervero 1996).

A 2004 study of home values along NJ TRANSIT's Morris & Essex line found that buyers paid $90,000 more to be within walking distance (one half-mile) of stations after new direct service to Midtown Manhattan was inaugurated in 1996 than before. Conversely, the value of homes farther away from the station went down over the same time period (Michaelson 2004).

Two studies conducted sixteen years apart each revealed that proximity to the Washington DC Metro had positive impacts on property values and rents. In 1980, just a few years after the transit system opened, houses near stations increased in value by 6% to 13% for every 100 meters (320 feet) closer to the Metro station that a house was located (Lerman, Damm et al. 1980). In 1996, Benjamin and Sirmans documented the fact that residential rents decreased by 2.4% for every one-tenth mile further a home was from Metro stations (Benjamin and Sirmans 1996).

In an extensive study of the Philadelphia region's SEPTA and PATCO heavy rail lines in 1991, Voith found that "premiums associated with accessibility to train service... average $5,594 or 6.4% of average house value" (Voith 1991). This study backs another one conducted in 1987 by the Joint Center for Urban Mobility Research, which found that the PATCO Lindenwold Line increased the value of nearby houses by 7%, or $4,500 on average (Joint Center for Urban Mobility Research 1987).

Other studies have found that proximity to the rail station may cause both positive and negative impacts concurrently. Al-Mosaind et al., for instance, found that in Portland, Ore., although residential property values increased if they were located within one-third mile of MAX light-rail stations, they decreased if they were located directly adjacent to the station (Al-Mosaind, Duecker et al. 1993). In other studies, the impacts of heavy rail on property values varied by the neighborhood. In Atlanta, for instance, rail stations did not increase sales values in poor neighborhoods because the rail line there was perceived as a nuisance. In rich neighborhoods, by contrast, the stations did add values to residential properties, presumably because the added accessibility compensated for the station's nuisance effects (Nelson 1992). Similarly, Gatzlaff and Smith found that the slight increase in sales values of single-family homes near Miami's Metrorail varied by neighborhood: Metrorail weakly increased the value of properties near stations in higher priced neighborhoods, but did not benefit properties in neighborhoods experiencing decline (Gatzlaff and Smith 1993).

Of course, the greater New York region is an entity unto its own when it comes to transit. Our cities and suburbs are built around an intricate system of commuter rail and subway, not to mention light rail and bus services. More than two-thirds of all heavy rail trips in the country take place in the New York region. NJ TRANSIT alone makes up 16% of all commuter rail trips in the country. The effect of any improvement to the rail system here is therefore much more significant to the people who use the system, to the value of the land served by the system, and to the regional economy. And because NJ TRANSIT and Metro-North constitute such a large share of the nation's overall ridership, improvements to those system have a national impact.

location	main findings	author
New Jersey, central	Faster commuter rail service to midtown Manhattan increased residential property values within 1/2 mile of train stations by $90,000 on an average property sale price of $447,000 (i.e. 20.1% premium).	Michaelson, Juliette, 2004.
New York City, NY	Average home prices declined by about $2,300 for every 100-foot distance from the Forest Hills, 67th Avenue, and Rego Park subway stations.	Anas, Alex, and Regina Armstrong, 1993.
Philadelphia metro area, PA and NJ	Median home prices were 10% higher in census tracts served by PATCO rail line, and 4% higher in tracts served by SEPTA rail line.	Voith, Richard, 1991.
Philadelphia metro area, PA and NJ	Holding all other factors constant, the value of commuter rail service, capitalized into house value, added an extra $5,716 or 6.4%. In the aggregate, the accessibility premium in real estate values for the Philadelphia suburban area is in the order of $2.43 billion.	Voith, Richard, 1990.
Chicago, IL	The price of a single-family house located 1,000 feet from a station was 20% higher than a comparable house located a mile away.	Gruen, Aaron, 1997.
Washington, DC	Rents decreased by 2.4% to 2.6% for each one-tenth mile in distance from a Metrorail station.	Benjamin, John D., and G. Stacy Sirmans, 1996.
Boston, MA	Single-family homes in communities served by commuter rail were 6.7% higher in value than other homes in the region.	Armstrong Jr., Robert J., 1994.
Toronto, CA	Proximity to the Spadina Line increased the average home value by $2,237.	Bajic, Vladimir, 1983.
San Francisco Bay area, CA	Housing rents within 1/4 mile of two of the BART stations were found to be 10% to 15% higher than the average rents in non-station areas. In the third station area, no rent premium was found.	Cervero, Robert, 1996.
San Francisco Bay area, CA	1990 single-family home prices declined by $1 to $2 per meter distance from a BART station. There was no significant impact on home values based on proximity to CalTrain commuter rail stations, although houses within 300 meters of the CalTrain right-of-way sold at a $51,000 discount.	Landis, John, Robert Cervero, Subhrajit Guhathukurta, David Loutzenheiser, and Ming Zhang, 1994.
San Francisco Bay area, CA	Home values incrased by $2.29 for every meter closer they were to BART in Alameda County, and by $1.96 in Contra Costa County. The extent to which a rail system captures ridership from its market area affects the extent to which property values are increased.	Landis, John, Subrajit Guhathakurta, and Ming Zhang, 1994.
San Francisco Bay area, CA	Single family homes were worth $3,200 to $3,700 less for each mile further from a BART station in Alameda and Contra Costa counties. Apartments near BART stations were found to rent for 15% to 26% more than apartments further from BART stations.	Sedway Group, 1999.

location	main findings	author
San Francisco Bay area, CA	Average home prices declined by about $1,578 for every 100-foot distance from the Pleasant Hill Rail Station, within a one-mile radius.	Lewis-Workman, Steven, and Daniel Brod, 1997.
Santa Clara County, CA	Large apartments within a quarter-mile of LRT stations commanded land-value premiums as high as 45%.	Cervero, Robert, and Michael Duncan, 2002.
Los Angeles, CA	The market value of condominiums within a 5-minute walk of the South Pasadena Metro Gold Line station increased 10-15% over other similar South Pasadena condominiums further away from the station even before service began.	Metro Gold Line Foothill Extension Construction Authority
San Diego, CA	Homes near Coaster commuter rail stations commanded 46% premiums for condominiums, 17% premiums for single-family homes, and 91% premiums for multifamily housing. Near Trolley stations, multifamily housing enjoyed 10% to 72% premiums, depending on the trolley line.	Cervero, Robert, and Michael Duncan, 2002.
San Diego, CA	On average, homes sold for $272 more for every 100 meters closer to a light rail station they were.	Landis, John, Subrajit Guhathakurta, and Ming Zhang, 1994.
Portland, OR	Homes within 500 meters of East Side MAX stations were worth 10.6% more than homes farther away.	Al-Mosaind, Musaad A., Kenneth J. Duecker, and James G. Strathman, 1993.
Portland, OR	A house valued at $82,800 (median price of housing in sample) at a station would be valued at $74,835 at a distance of 1000 ft away from the station.	Dueker, Kenneth J., and Martha J. Bianco, 1999.
Atlanta, GA	Home prices gained $1,000 for every 100 feet closer a house is to a rail station in low-income, transit-adjacent census tracts. There was a slight negative effect in high-income tracts, though this may be due to proximity to industrial uses or to low-income neighborhoods.	Arthur C. Nelson, 1992.
Dade County, FL	Real estate values near Miami's Metrorail gained, at most, a 5% higher rate of appreciation compared to the rest of the City of Miami. Higher priced neighborhoods experienced greater increases in property values near Metrorail stations while declining ones did not.	Dean H. Gatzlaff and Marc T. Smith, 1993.
Saint Louis, MO	Average home values increased $140 for every 10 feet closer to a MetroLink station within a radius of 1,460 feet. Homes situated 100 feet from a station had a price premium of $19,029, representing a 32% increase in average property value.	Garrett, Thomas, 2004.

Appendix B: Detailed notes about methodology

How did travel improvements from NJ TRANSIT's three built projects affect home values, on average?

About property sales data:

- Sales data were collected from both the Garden State Multiple Listing Service and the New Jersey Multiple Listing Service. Each database covers a slightly different geographical area.
- Properties were assigned to their closest station by road, per GIS, regardless of parking availability or proximity to a station with better service.
- Only properties within two miles of a station that was within 70 minute-equivalents of Midtown Manhattan after the improvements were included in the model.
- Only property sales that took place between 3.5 and 5.5 years before and after the relevant improvement were included in the model.

About schedule analysis:

- Properties were assigned a trip-time improvement based on the reduction in trip time at the properties' assigned station. This trip-time improvement was calculated by comparing pre-improvement schedules (1995 schedules for stations on the Morris & Essex line, 2002 schedules for the Montclair-Boonton line, and 2003 schedules for the Pascack Valley and Main/Bergen/Port Jervis line) with current schedules.
- Trip-times before Midtown Direct (1995 schedules), Montclair Connection (2002 schedules) and Secaucus Junction (2003 schedules) were compared with current schedules, for the entire NJ TRANSIT system.
- Trip times were calculated to reflect: 1) actual travel time, 2) the need to transfer, and 3) service frequency. Transfers and service frequency were translated into "minute-equivalents" so they were in the same "currency" as scheduled travel times, and could be added to them. Final trip times were thus made up of three elements:
  - The scheduled travel time savings achieved by the relevant project (Midtown Direct, Montclair Connection or Secaucus Junction) to either Penn Station-NY or the 33rd Street PATH station in minutes, per published NJ TRANSIT schedules, for morning peak trains (i.e. those that arrive between 7am and 9am, per standard NJ TRANSIT modeling practice).
  - A minute-equivalent penalty for transfers. Per standard NJ TRANSIT modeling practice, transfers typically incur a penalty of 5.3 minute-equivalents; transfers that are simply across the platform incur a 2-minute-equivalent penalty.
  - A minute-equivalent penalty for infrequent service during the morning two-hour peak period. Per standard NJ TRANSIT modeling practice, if the average wait time was under 15 minutes (in other words, more than eight trains during the two-hour peak), the penalty was half the wait time; if the average wait time was between 15 and 30 minutes, the penalty was 7.5 minutes plus one-quarter of the wait time over 15 minutes; if the average wait time was over 30 minutes, the penalty was 11.25 minutes plus one-eighth of the wait time over 30 minutes.
- If a station had both direct and indirect service to Penn Station-NY (via PATH or a connecting NJ TRANSIT train), only Penn-Station bound trains were included.
- NJ TRANSIT has radically revised its schedules' time estimates for PATH over the years. In 1995, trip times from Hoboken to 33rd Street were estimated to be 11 minutes; they average 22 minutes in today's schedules. This study assumed that this difference was the result of a NJ TRANSIT recalibration, not of actual differences in trip times, and used a static 22-minute trip time throughout the study period.
- Over the years, NJ TRANSIT has increasingly been building a small amount of room into its schedules in order to account for typical service delays. This study did not account for this practice.

About the regression model and its variables:

- The nature of a regression analysis is that it compares and weighs the value of each characteristic (or variable) against each other. By definition, therefore, only MLS entries that included all data points (bedrooms, bathrooms, fireplaces, garage, and architectural style) were able to be included in the regression. Nevertheless, the model remains statistically significant, as more than 45,000 MLS entries were in fact complete, and there is no reason to believe that incomplete MLS entries were not distributed randomly across the sample.
- The regression included the following variables:
  - Number of bedrooms, per the MLS
  - Number of bathrooms, per the MLS
  - Number of fireplaces, per the MLS
  - Garage capacity, per the MLS
  - Desirable architectural styles were defined as Colonial, Victorian or Tudor. Those properties were assigned the dummy "1;" all others, "0."
  - Quality of the school district was measured by the percentage of students who tested Proficient or Advanced Proficient in math and language in 2007. Source: New Jersey Department of Education school report cards.
  - Density of the road network around the station, per GIS data
  - Distance of the property from the nearest train station by road, per GIS data and assuming different travel speeds on different road classifications
  - Availability of competitive bus service. A dummy variable was included in the regression to reflect whether at the time of sale, there existed bus service that was competitive with rail service. For time and budgetary reasons, this assessment could be made only coarsely – only for the location of the station itself, not near the home itself. Frequently, the most attractive feature of bus service is

frequent and proximate departure points, but this study was not able to take that into account. Nevertheless, availability of competitive bus service was a very significant variable in the model.

- Reduction in trip times at the properties' assigned station after Midtown Direct, Montclair Connection or Secaucus Junction.
- Changes in the economy and real estate market, accounted for by using the year of sale as a variable in the regression.

➜ A small number of outlier properties were excluded from the regression, namely:

- Properties whose nearest station was a park-and-ride (i.e., had more than 1,000 parking spots)
- Properties that sold for more than $2,000,000 or less than $75,000
- Properties that had more than six fireplaces, six bedrooms or six bathrooms, or had a garage capacity greater than four.

➜ Unfortunately, certain critical data about the properties sold were not available and were not included in the regression, most notably, house size, lot size, and age of the house.

➜ Property tax rates were not included in the regression because they were not statistically significant. The effect of tax rates on home values were likely already accounted for in the "quality of school district" variable.

Results summary (for the complete tables, please refer to Appendix C)

Distance from the station	beta	sig.
0 to 2 miles	**1,959**	**0.000**
0 to 0.5 miles	2,902	0.000
0.5 to 1 mile	1,931	0.000
1 to 1.5 miles	1,310	0.000
1.5 to 2 miles	882	0.000

Average value of each minute reduction in trip times

In other words, every minute of trip-time improvement, for all properties included in the regression, was worth $1,959 on the average price of a home ($450,991). Every minute of trip-time improvement added $2,902 to average-priced homes within walking distance of the stations (within one half-mile). The effect of improvements in travel times declines sharply as distance from the station grows.

The average gain in value per home was calculated by multiplying the value of each minute saved (as described above) by the average reduction in trip times. This average reduction in trip times was weighted according to the number of housing units assigned to the stations.

What was the cumulative gain in value from these three projects, and how did these gains translate in property tax revenues for municipalities?

➜ Every station in the NJ TRANSIT system was assigned a trip-time improvement by comparing pre-improvement schedules (1995 schedules for stations on the Morris & Essex line, 2002 schedules for the Montclair-Boonton line, and 2003 schedules for the Pascack Valley and Main/Bergen/Port Jervis line) with current schedules.

➜ Using GIS, the model estimated how many housing units were located within 0.5 mile, 0.5 to 1 mile, 1 to 1.5 mile and 1.5 to 2 miles of every station in the NJ TRANSIT system as it existed in 1996, and as it exists today (a number of new stations have been built, a handful have been decommissioned). Housing units data is from the 2000 Census.

➜ Cumulative gains in home values across the NJ TRANSIT system were calculated as follows:

*[Station A trip-time improvement] * [Number of housing units within 0.5 miles of Station A] * [Average increase per minute-equivalent for homes within 0.5 mile, i.e. $2,902] +*

*[Station A trip-time improvement] * [Number of housing units 0.5 to 1 mile of Station A] * [Average increase per minute-equivalent for homes 0.5 to 1 mile, i.e. $1,931] +*

... +

*[Station B trip-time improvement] * [Number of housing units within 0.5 miles of Station B] * [Average increase per minute-equivalent for homes within 0.5 mile, i.e. $2,902] +*

... +

Etc.

➜ The gains for properties assigned to stations farther than 70 minute-equivalents in post-project schedules (i.e. current schedules) were graduated from 100% for stations at 70 minute-equivalents or less, to 0% at the farthest stations on the network. Gains were graduated proportionally to trip times between those two extremes.

➜ Cumulative gains in property tax revenues from higher home values across the NJ TRANSIT system were calculated using a similar formula, but also taking into account the municipalities in which housing units are located, and those municipalities' tax rates:

*[Station A trip-time improvement] * [Number of housing units within 0.5 miles of Station A in Town A] * [Average increase per minute-equivalent for homes within 0.5 mile, i.e. $2,902] * [effective 2009 property tax rate in Town A] +*

*[Station A trip-time improvement] * [Number of housing units within 0.5 miles of Station A in Town B] * [Average increase per minute-equivalent for homes within 0.5 mile, i.e. $2,902] * [effective 2009 property tax rate in Town B] +*

... +

*[Station A trip-time improvement] * [Number of housing units 0.5 to 1 mile of Station A in Town A] * [Average increase per minute-equivalent for homes 0.5 to 1 mile, i.e. $1,931] * [effective 2009 property tax rate in Town B] +*

... +

*[Station B trip-time improvement] * [Number of housing units within 0.5 miles of Station B in Town A] * [Average increase per minute-equivalent for homes within 0.5 mile, i.e. $2,902] * [effective 2009 property tax rate in Town B] +*

... +

Etc.

➜ Again, the gains in property tax revenue stemming from properties assigned to stations farther than 70 minute-equivalents in post-project schedules (i.e. current schedules) were graduated from 100% for stations at 70 minute-equivalents or less, to 0% at the farthest stations on the network. Gains were graduated proportionally to trip times between those two extremes.

What might be the cumulative effect of ARC on home values and municipal property tax revenues?

- Every station in the NJ TRANSIT system was assigned a trip-time improvement by comparing current schedules with an educated guess about post-ARC schedules.
- Future improvements from ARC were estimated using the following assumptions:
- Using GIS, the model estimated how many housing units were located within 0.5 mile, 0.5 to 1 mile, 1 to 1.5 mile and 1.5 to 2 miles of every station in the NJ TRANSIT system as it exists today. The model assumes no new or decommissioned stations in the future. Housing units data is from the 2000 Census.
- Cumulative gains in home values and property taxes across the NJ TRANSIT system were calculated using the same methodology as in Step 2.

Time savings generated by ARC (anticipated)

	PV	M/B/PJ	Mo-Bo to MSU	Mo-Bo past MSU	M&E to Dover	M&E past Dover	RV	NEC	NJCL to Long Branch	NJCL past Long Branch
Improvement in scheduled trip times	6	6	8	11	8	11	11	8	8	11
Faster travel time crossing the Hudson (less congestion, fewer trains stopping at Secaucus)			6	6	6	6	6	6	6	6
No more transfer at Secaucus (walk time, wait time)	4	4								
No more transfer at Newark (walk time, wait time)							3			
No more transfer from diesel line (walk time, wait time)				3		3				3
Crowding relief at PSNY/34th St terminal (over no-build condition)	2	2	2	2	2	2	2	2	2	2
Improvement in transfer penalty	5.3	5.3	0	2	0	2	5.3	0	0	2
Improvement in frequency penalty	varies by station									

Appendix C: Regression results

How did travel improvements from NJ TRANSIT's three built projects affect home values, on average?

Homes sold within 2 miles of stations

	Unstandardized coefficients		Standardized coefficients		
	B	Std. error	Beta	t	Sig
(Constant)	-476,992	7,671		-62.183	0.000
trip time reduction post-project	**1,959**	**107**	**0.069**	**18.362**	**0.000**
number of bedrooms	38,605	862	0.159	44.800	0.000
number of full bathrooms	90,585	1,058	0.300	85.636	0.000
number of fireplaces	92,824	1,174	0.267	79.072	0.000
garage capacity	35,788	1,005	0.115	35.627	0.000
house style is Victorian, Tudor or Colonial (dummy)	23,819	1,480	0.050	16.092	0.000
quality of the school district	2,876	32	0.307	90.635	0.000
bus service to Midtown is competitive with rail (dummy)	36,708	2,231	0.075	16.453	0.000
density of road network	-521	39	-0.045	-13.504	0.000
distance 0.5 to 1 mi	4,740	2,199	0.010	2.155	0.031
distance 1 to 1.5 mi	11,628	2,279	0.023	5.102	0.000
distance 1.5 to 2 mi	19,537	2,422	0.035	8.067	0.000
sold in 1993	-89,919	5,011	-0.058	-17.945	0.000
sold in 1994	-85,860	4,939	-0.056	-17.384	0.000
sold in 1995	-97,405	4,864	-0.064	-20.028	0.000
sold in 1996	-114,563	4,712	-0.078	-24.311	0.000
sold in 1997	-118,395	4,149	-0.096	-28.536	0.000
sold in 1998	-87,412	4,021	-0.074	-21.739	0.000
sold in 1999	-63,218	3,454	-0.064	-18.305	0.000
sold in 2000	-23,737	2,772	-0.032	-8.562	0.000
sold in 2002	29,341	3,059	0.034	9.592	0.000
sold in 2003	53,913	3,043	0.064	17.716	0.000
sold in 2004	75,668	3,181	0.092	23.791	0.000
sold in 2005	121,098	3,232	0.144	37.470	0.000
sold in 2006	121,380	3,325	0.137	36.505	0.000
sold in 2007	95,588	3,467	0.100	27.573	0.000
sold in 2008	42,187	3,938	0.037	10.712	0.000

R	0.802
R square	0.643
Adj. R square	0.642
Std. error	140,830

Homes sold 0 to 0.5 mile from stations

	Unstandardized coefficients		Standardized coefficients		
	B	Std. error	Beta	t	Sig.
(Constant)	-334,694	21,570		-15.516	0.000
trip-time reduction post project	**2,902**	**264**	**0.107**	**11.006**	**0.000**
number of bedrooms	40,109	2,243	0.187	17.884	0.000
number of full bathrooms	89,162	3,021	0.281	29.518	0.000
number of fireplaces	85,462	3,203	0.254	26.684	0.000
garage capacity	33,952	2,716	0.110	12.501	0.000
house style is Victorian, Tudor or Colonial (dummy)	42,912	4,718	0.081	9.095	0.000
quality of the school district	2,408	94	0.224	25.736	0.000
bus service to Midtown is competitive with rail (dummy)	47,249	5,631	0.094	8.391	0.000
density of road network	-1,674	123	-0.117	-13.664	0.000
sold in 1993	-107,611	13,231	-0.072	-8.133	0.000
sold in 1994	-87,831	13,387	-0.058	-6.561	0.000
sold in 1995	-90,720	13,595	-0.059	-6.673	0.000
sold in 1996	-120,424	13,650	-0.077	-8.822	0.000
sold in 1997	-140,172	11,117	-0.118	-12.609	0.000
sold in 1998	-93,958	11,216	-0.078	-8.377	0.000
sold in 1999	-66,228	9,539	-0.066	-6.943	0.000
sold in 2000	-24,140	7,895	-0.031	-3.058	0.002
sold in 2002	27,522	8,869	0.030	3.103	0.002
sold in 2003	48,291	8,855	0.054	5.453	0.000
sold in 2004	68,177	9,064	0.078	7.522	0.000
sold in 2005	113,051	9,299	0.125	12.158	0.000
sold in 2006	122,535	9,689	0.127	12.646	0.000
sold in 2007	88,800	9,937	0.088	8.937	0.000
sold in 2008	48,257	12,140	0.036	3.975	0.000

R	0.815
R square	0.654
Adj. R square	0.662
Std. error	143,370

Homes sold 0.5 to 1 mile from stations

	Unstandardized coefficients		Standardized coefficients		
	B	Std. error	Beta	t	Sig.
(Constant)	-493,065	13,961		-35.317	0.000
trip-time reduction post project	**1,931**	**179**	**0.069**	**10.760**	**0.000**
number of bedrooms	33,665	1,566	0.132	21.493	0.000
number of full bathrooms	92,168	1,871	0.297	49.251	0.000
number of fireplaces	98,910	2,063	0.279	47.934	0.000
garage capacity	34,354	1,819	0.104	18.891	0.000
house style is Victorian, Tudor or Colonial (dummy)	27,928	2,790	0.054	10.011	0.000
quality of the school district	3,081	56	0.315	55.057	0.000
bus service to Midtown is competitive with rail (dummy)	41,809	3,931	0.084	10.636	0.000
density of road network	-588	84	-0.039	-7.041	0.000
sold in 1993	-108,525	8,290	-0.073	-13.092	0.000
sold in 1994	-89,671	8,146	-0.062	-11.007	0.000
sold in 1995	-118,452	8,306	-0.080	-14.260	0.000
sold in 1996	-122,485	8,021	-0.085	-15.271	0.000
sold in 1997	-116,219	7,037	-0.098	-16.517	0.000
sold in 1998	-89,483	6,813	-0.079	-13.135	0.000
sold in 1999	-65,882	6,033	-0.067	-10.920	0.000
sold in 2000	-20,250	5,042	-0.026	-4.017	0.000
sold in 2002	28,022	5,682	0.030	4.932	0.000
sold in 2003	51,696	5,660	0.057	9.134	0.000
sold in 2004	76,857	5,836	0.088	13.169	0.000
sold in 2005	122,290	6,005	0.133	20.364	0.000
sold in 2006	122,301	6,192	0.126	19.751	0.000
sold in 2007	97,454	6,419	0.095	15.181	0.000
sold in 2008	40,765	7,292	0.033	5.591	0.000

R	0.788
R square	0.621
Adj. R square	0.620
Std. error	151,832

Homes sold 1 to 1.5 miles from stations

	Unstandardized coefficients		Standardized coefficients		
	B	Std. error	Beta	t	Sig.
(Constant)	-498,320	13,030		-38.243	0.000
trip-time reduction post project	**1,310**	**205**	**0.045**	**6.389**	**0.000**
number of bedrooms	42,739	1,602	0.169	26.671	0.000
number of full bathrooms	88,089	1,950	0.291	45.182	0.000
number of fireplaces	96,340	2,187	0.270	44.060	0.000
garage capacity	36,807	1,837	0.119	20.037	0.000
house style is Victorian, Tudor or Colonial (dummy)	26,204	2,592	0.056	10.109	0.000
quality of the school district	3,014	58	0.315	51.779	0.000
bus service to Midtown is competitive with rail (dummy)	31,007	4,056	0.062	7.645	0.000
density of road network	-478	67	-0.042	-7.125	0.000
sold in 1993	-79,897	9,969	-0.046	-8.014	0.000
sold in 1994	-109,619	9,719	-0.065	-11.279	0.000
sold in 1995	-111,626	9,515	-0.067	-11.731	0.000
sold in 1996	-134,227	9,005	-0.085	-14.906	0.000
sold in 1997	-128,416	7,897	-0.098	-16.261	0.000
sold in 1998	-91,072	7,441	-0.075	-12.240	0.000
sold in 1999	-63,588	6,255	-0.064	-10.165	0.000
sold in 2000	-23,502	4,937	-0.032	-4.760	0.000
sold in 2002	32,459	5,425	0.038	5.983	0.000
sold in 2003	59,018	5,399	0.071	10.932	0.000
sold in 2004	82,837	5,702	0.102	14.529	0.000
sold in 2005	130,681	5,778	0.158	22.616	0.000
sold in 2006	129,328	5,892	0.152	21.950	0.000
sold in 2007	102,526	6,074	0.113	16.880	0.000
sold in 2008	50,218	6,890	0.046	7.288	0.000

R	0.810
R square	0.655
Adj. R square	0.655
Std. error	137,618

Homes sold 1.5 to 2 miles from stations

	Unstandardized coefficients		Standardized coefficients		
	B	Std. error	Beta	t	Sig.
(Constant)	-418,231	14,289		-29.270	0.000
trip-time reduction post project	**882**	**246**	**0.032**	**3.590**	**0.000**
number of bedrooms	39,027	1,667	0.165	23.418	0.000
number of full bathrooms	91,252	1,963	0.336	46.481	0.000
number of fireplaces	75,855	2,265	0.220	33.496	0.000
garage capacity	36,741	1,863	0.132	19.719	0.000
house style is Victorian, Tudor or Colonial (dummy)	9,696	2,547	0.023	3.807	0.000
quality of the school district	2,659	60	0.328	43.994	0.000
bus service to Midtown is competitive with rail (dummy)	5,267	4,937	0.011	1.067	0.286
density of road network	-125	62	-0.015	-2.019	0.044
sold in 1993	-62,687	10,232	-0.041	-6.126	0.000
sold in 1994	-64,124	10,097	-0.042	-6.351	0.000
sold in 1995	-62,630	9,065	-0.046	-6.909	0.000
sold in 1996	-79,557	8,833	-0.060	-9.007	0.000
sold in 1997	-94,417	8,335	-0.079	-11.328	0.000
sold in 1998	-77,866	8,196	-0.066	-9.501	0.000
sold in 1999	-57,595	6,828	-0.060	-8.435	0.000
sold in 2000	-31,657	5,068	-0.047	-6.246	0.000
sold in 2002	28,255	5,393	0.038	5.239	0.000
sold in 2003	56,711	5,355	0.079	10.590	0.000
sold in 2004	84,521	5,869	0.120	14.402	0.000
sold in 2005	127,785	5,858	0.181	21.814	0.000
sold in 2006	124,289	6,031	0.167	20.610	0.000
sold in 2007	103,070	6,455	0.123	15.967	0.000
sold in 2008	51,163	7,091	0.052	7.215	0.000

R	0.816
R square	0.666
Adj. R square	0.665
Std. error	120,421

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