

RESEARCH QUESTION:

What effect does proximity to the LA Metro Bus Rapid Transit G line have on home values?

ABSTRACT

As more communities make significant investments in Bus Rapid Transit (BRT), understanding how these transit systems affect surrounding housing markets has become an important planning question. This study estimates the impact of the Los Angeles Metro G line, the region's first BRT corridor, on residential property values in the San Fernando Valley. Using 13,164 property sales records from the Multiple Listing Service (MLS), for the years 2000 through 2024, this study utilizes a hedonic pricing model and ordinary least squares regression (OLS) analysis. The results indicate that after accounting for differing structural characteristics, proximity to the BRT G Line had very little statistically significant positive or negative impacts on home sale prices. These findings suggest that the introduction of the BRT line neither depressed nor enhanced home values, adding important data to ongoing debates about the benefits of investments in public transit and their relationship to property values. As Los Angeles continues to expand its BRT network in the face of continued community opposition, and other cities consider BRT investments, this information will aid policy makers and researchers in understanding and dispelling fears of potential negative consequences to public transportation investments.

## INTRODUCTION

Los Angeles, California, once home to the Pacific Electric Railway, (at one time the largest electric interurban transit system in the world), is again investing in electric public transportation systems, including Bus Rapid Transit (BRT) lines featuring electric buses. This study looks at the first BRT line built in Los Angeles, the LA Metro G Line (formerly Orange Line), that operates along a converted rail corridor previously owned by the Southern Pacific Railroad in the San Fernando Valley. When first proposed, this BRT line faced significant opposition from the community in part because of the perceived negative effect the BRT would have on property values (Covarrubias, 2005). Twenty years after the BRT opened, this study looks at whether those fears were realized by evaluating the long-term effects on property sales adjacent to this line.

## LITERATURE REVIEW

Over the past several years there has been a growing body of research studying the relationship between home values and proximity to transit utilizing hedonic pricing models first proposed by Sherwin Rosen (1974). In these models, the price of a specific good (e.g. housing) is understood as a reflection of the implicit value of the good's attributes. In this framework, changes in property valuations can be predicted by looking at a combination of characteristics, including physical features, neighborhood qualities, and proximity to amenities such as access to public transportation. Proximity to a BRT corridor can therefore be understood as an important variable affecting home values. Understanding

this relationship is crucial in assessing the market effects of municipal investments in public transportation.

The increasing interest and investment in BRT systems across the globe has produced a growing body of literature on the effect of BRT systems on the communities they serve. This research has mainly been centered on South American and Asian BRT systems, as these are where the most mature full-featured systems are located and which offer rich data sets to analyze. Notably, these systems are in municipalities with land use patterns that reinforce the positive values of public transportation. These systems, operating adjacent to dense housing and concentrated job centers, position BRT as an efficient and accessible high quality transit option. Accordingly, studies of these systems show consistent property value increases within walking distance of stations, suggesting that when a BRT system is similar to the integration, reliability, and frequency of urban rail systems, adjacent property values rise (Beaudoin et al., 2023).

In contrast, studies of US BRT systems reveal a more complicated picture. A recurring observation is that BRT in the United States is more heterogeneous, ranging from separated busways offering true “light rail on wheels” amenities such as raised platforms and preboarding fare collection, to “BRT-Lite” systems operating in mixed flow traffic and served by conventional bus stops. Because of this wide range of implementations, these studies offer less consistent, conclusive, and positive findings.

The multi-city comparison by Acton, et al (2022) offers the best example of both the extent and the effects of the heterogeneity of US BRT systems. Across the eleven US BRT

systems studied, effects on property values varied widely based on differences in corridor design, station environments, and surrounding zoning and housing types. The most cited BRT features that positively correlate to higher property values are integrated travel corridors, pedestrian friendly stations, rail-like amenities, and adjoining parcels zoned for mixed use. Conversely, the absence of these features correlates to diminished positive valuation effects on surrounding neighborhoods.

In analyzing property values, housing type is the most essential variable to be considered. Overall, single family homes near busways frequently declined in value whereas multifamily residences showed modest increases. Acton et al. (2022) attribute these outcomes to the automobile centered design of US BRT stations, many of which are surrounded by park and ride lots and are not pedestrian facing. This design choice creates less connection to the surrounding neighborhoods and heightens the nuisance effect of increased automobile traffic attracted by the park and ride amenity. Based on this research, Acton et al. (2022) concludes that the physical integration of BRT stations into the surrounding community is just as important as transit speed or frequency in positively impacting property valuations.

A second theme that emerges in the literature is the importance of walkability and the quality of the station area environment. In a study of the Eugene (Oregon) EmX BRT, Nelson & Hibberd (2021) cite the importance of these qualities along with predominance of mixed-use properties near BRT stations in producing positive distance-decay relationship between a property's proximity to a BRT station and home valuation.

A third important theme is identified by Beaudoin and Tyndall in their 2023 study of the Clark County (Washington), BRT. Their study identifies anticipatory and post opening positive valuation effects occur in anticipation of improved accessibility. Their research highlights that positive perception of the service is as important as actual service in positively affecting home values.

Taken together, the literature highlights that BRT's effect on home values is not intrinsic to the mode itself but emerges from the combination of six principal factors. Acton et al. (2022) highlight transit integration (whether separated or on-street routes) and housing types (single family versus multifamily), as two key determinants. BRT lines with the most visible transit mode and the largest stock of adjacent multifamily housing will result in higher positive valuations. Nelson et al. (2021) identify walkability and mixed-use properties as key drivers of valuation increases as factors three and four, with mixed-use properties closest to a station experiencing the highest positive outcomes. Zhang et al. (2021), in their study of two Connecticut BRT systems, posit rail-like amenities as the fifth key factor, noting that these amenities have more positive effects compared to bus-like operations. Finally, Shen et al. (2018) highlights the final key determinant is a policy environment that supports higher density mixed-use housing near transit as a driver of increasing property valuations.

The Los Angeles Metro BRT G line, which is the focus of this study, represents a unique BRT implementation. The G Line corridor is on a dedicated separated busway with stations featuring park and ride amenities along a suburban corridor shaped by historical low growth single family housing policies, conditions which the literature suggests will not

positively affect home valuations. Plans to extend this BRT line eastward across the San Fernando Valley in a more integrated fashion has met fierce local opposition. This study, which uses a hedonic model coupled with ordinary least squares regression analysis, is intended to add to the literature by providing important data on the potential effect of this BRT to local homeowners given a different implementation may produce more positive outcomes.

## METHODS

Data for this study was collected from the California Regional Multiple Listing Service (CRMLS). CRMLS is a subscriber-based technology platform currently used by over 103,000 real estate professionals to list and track property sales across California. Founded in 1979, CRMLS reports not just sales figures, but also a broad array of information about each property listed and sold. According to the most recent CRMLS statistics, only 1.3% of property sales in California were never listed on their service, which confirms the significance of their database (CRMLS, 2024).

The CRMLS database, which is primarily a sales tool for real estate agents, is also a good source of sales data because it does not include conveyances (e.g. transferring a property from individual ownership into a trust), which is included in the larger Los Angeles County Assessor's database of home sales. Prices recorded in conveyance transactions are inherently affected by tax considerations and less reflective of real-world conditions. As such, the CRMLS is an excellent source for the reliable market value of homes.

## DATA

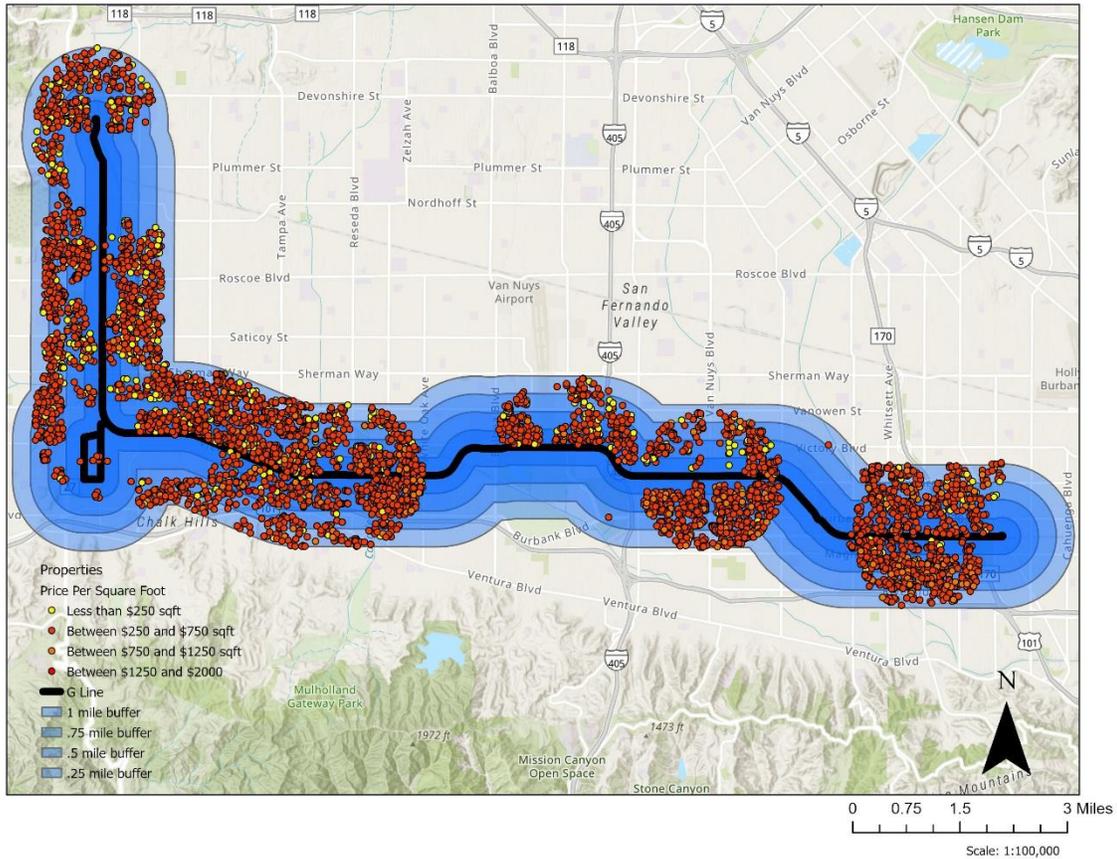
Data for this study was aggregated from the CRMLS for property transactions within one mile of a LA Metro G Line BRT station for the years 2000, 2005 (year the BRT began operations), 2010, 2015, 2020, and 2024 (the most recent complete calendar year). Once duplicate entries were removed (properties within one mile of two stations), the resulting data set totaled 13,164 unique transactions. Descriptive data on each property, which included address, home type, sales date, price per square foot, and year built, was then analyzed using a hedonic least squares regression model to determine the effect of proximity to BRT on comparable property transactions in each of the study years.

The dataset included many similar categories of home types which was collapsed into two broad categories, single family homes and condominiums. These properties were then grouped by distance, measured in tenth of a mile increments from a BRT station. While the literature notes that properties located at distances over half mile from transit are not affected by that transit (Beaudoin et al., 2023), properties up to one mile away were included in this study to provide a control group to better understand the value difference in properties closer to BRT.

Due to the large number of individual contributors to this dataset, there were a small number of transactions with missing data fields (< 5%). These transactions were deleted from the dataset. Also of note, as the popularity of the CRMLS service has grown, the number of transactions included has also grown, making the data from the most recent years more comprehensive than earlier years.

Map 1: Study Area and Recorded Home Sales 2000 to 2024

Properties Sold Within One Mile of the Metro G Line BRT



Map One shows the study area with the subject properties grouped by quarter mile buffers and identified by transactional price per square foot. As illustrated in Graph One (below), these transactions are not normally distributed but do offer a wide range of housing prices. This range of prices confirms the heterogeneity of the data in this study area and reinforces why this is a good foundation for researching hedonic pricing effects.

Graph One: Price Distribution of all Properties Sold

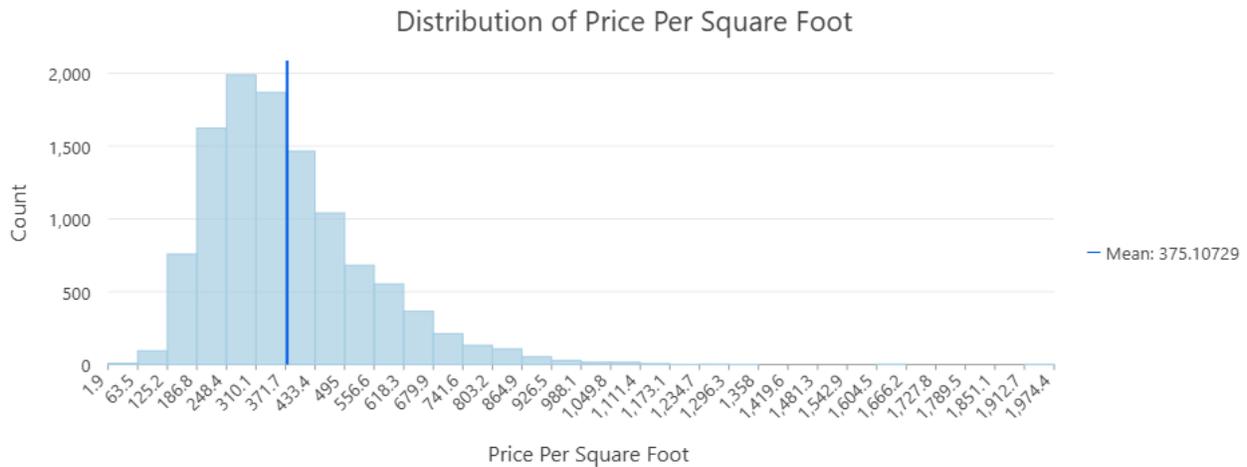


Table One (below), summarizes the descriptive statistics of the variables in the hedonic least squares regression model used in this study. The primary variable of interest, distance from BRT, ranges from 0 to 1 mile, with the average being .68 miles. This suggests that the majority of properties are within walking distance of BRT and therefore good test subjects for understanding BRT property value effects. There is also substantial variability in property types (66% of property are single family residences with the remainder being condominiums, townhomes, or duplexes), and structural details. Overall, this data suggests variability in housing location and housing characteristics which supports the choice to use a hedonic regression model to isolate the effects of independent variables on housing prices.

Table One

	Mimumum	Maximum	Average	Median
Price Per Square Foot	52.71	2750.67	377.87	345.07
Distance (miles)	0	1	0.68	0.70
Total Square Feet	411	12164	1621	1464
Property Type (0 = Condo, 1= SFR)	0	1	1	1
Bedrooms	1	12	3	3
Bathrooms	1	9	2	2
Year Built	1895	2024	1965	1960
Date of Sale	2000	2024	2016	2015
Total Properties	13164			

Previous studies have also relied on hedonic regression models made with publicly available home sales data and distance correlations, which makes the data in this study comparable to the literature (Acton, et al 2022, Beaudoin, et al. 2023, Perk, et al 2021), on understanding property values in relation to their proximity to BRT.

## STATISTICAL ANALYSIS

Initially a correlation analysis was performed to determine the significance of the dataset, the results of which can be found in Table Two. The key finding of this analysis is that distance has an almost insignificant relationship to price per square foot, the primary research question in this study. This finding mirrors results from multiple BRT studies (Acton et al., 2022; Beaudoin & Tyndall, 2023; Benson et al., 2020; Perk et al., 2010).

Table Two: Correlation Analysis

	Price Per Square Foot	Distance	SQFT	Sub Type 1 =SFR 0 =Condo	Bedrooms	Baths	Yr Built	Sale Date
Price Per Square Foot	1							
Distance	0.025	1						
SQFT	0.027	0.041	1					
Sub Type 1 = SFR, 0 =Condo	0.286	0.085	0.397	1				
Bedrooms	0.046	0.061	0.730	0.554	1			
Baths	-0.018	-0.043	0.742	0.081	0.567	1		
Yr Built	-0.244	-0.066	0.093	-0.585	-0.099	0.299	1	
Sale date	0.634	-0.013	0.082	-0.006	0.079	0.165	0.028	1

The strongest correlations, shown in Table Two, are between property type, number of bedrooms, year built (negative in this category corresponds to higher values), and year

sold, all of which are to be expected. In any market, single family homes can be expected to sell for higher prices than condominiums, newer homes generally cost more (except in relation to architecturally significant or historical homes, which are not found in this area), extra bedrooms add value, and year sold increases price as prices have historically risen (except during economic recessions, an effect also seen in the data).

This correlation analysis also shows that some structural housing elements (square footage, bedrooms, bathrooms, and property type) are strongly correlated with each other. In contrast, distance presents very limited correlation to other property characteristics, which shows that the trend for proximity to the BRT is largely independent of home size, age, or type of residence. Overall, the data indicates that the distance effect is not tied to other independent variables related to housing prices, supporting the concept of distance as a measurable attribute to examine.

Multiple regression analyses were then performed to answer the research question. The dependent variable in each of these regressions is price per square foot, which is consistent with other hedonic pricing models. These regression analyses controlled for sales dates, as overall home prices can be understood as primarily affected by overall market conditions.

The initial regression analysis broke the data set down by distance from the BRT line. The literature posits that properties within .5 miles of a BRT are affected by the BRT and those outside .5 miles are not (Beaudoin et al., 2023; Shen et al., 2018). To control for this hypothesis, properties up to one mile from the BRT were included in this study.

Table Three: Regression Analysis by Buffers

	Between 0 & .2 miles Coefficients	Between .3 to .4 miles Coefficients	between .5 and .6 miles Coefficients	between .7 & .8 miles Coefficients	between .9 and 1 miles Coefficients
Distance	-65.89	38.14	24.63	123.93	-113.76
SqFT	-0.06	-0.02	-0.01	0.00	0.01
Prop Type	156.15	153.38	122.78	119.28	137.90
Bedrooms	-21.13	-38.71	-29.30	-35.49	-36.44
Baths	7.02	1.80	-3.02	-0.96	-9.37
Yr Built	-0.14	-0.85	-0.39	-0.76	-0.32
Sale Date	18.92	19.40	19.24	19.06	18.20

The model explains 53% of the variation in pricing as shown in the returned R Squared value of .528 which, while lower than other models (Beaudoin & Tyndall, 2023, who report 83% in their models), it is still consistent with other studies analyzing property valuation effects. This difference can be explained by Beaudoin et al.'s use of both block level and repeat sales numbers which generally return higher R squared values.

Each column represents a unique regression analysis performed for properties in .2-mile increments in distance from the BRT. The key statistic is the distance coefficient which represents the effect on valuations within that band in relationship to the distance from the BRT. The data suggests that distance within bands is indeed nonlinear and location dependent, with the strongest correlations displayed in the .2-mile buffer and the .9-mile buffer. The negative coefficients indicate that properties farther from BRT reflect lower values as compared to properties within the band that are closer. The middle buffers (.3 to .8) show the opposite effect through their strong positive values. This shows that these properties rise in value as distance from the BRT increases. The heterogeneous

nature of these results generally supports the hypothesis that homes closest to the BRT (0.0 to 0.2 miles), do show a small positive valuation effect. This heterogeneity is also reflective of the multiple variables that affect home pricing which may reinforce or diminish home valuations (aesthetics, traffic, noise, zoning changes, etc.) Of note to researchers, the data from the farthest buffer shows that the “walkshed” of the BRT may be larger than suggested in the literature. The difference in effects by band also reinforces the hypothesis that positive effects are not uniform in this BRT adjacent neighborhood and that other factors beyond distance from the BRT have a larger effect on home valuations.

The analysis also confirms the widely accepted assumptions that single family homes cost more than condominiums (with positive coefficients ranging from 119.27 to 156.15). That increased number of bedrooms has a negative coefficient, while not intuitive, may reflect that many of these bedrooms are small relative to property square footage.

To better understand this data, additional regressions tests were performed to both account for sales year and the independent variables of number of bedrooms, number of bathrooms, and property type. These analyses allow a greater understanding of the robustness of the distance correlation as shown in Table Four.

Table Four: Multiple Regression Analysis with Variables Removed.

Regression A			Regression B			Regression C		
Bedrooms Not Counted			Bathrooms Not Counted			Property Type Not Counted		
	Coefficient	P-value		Coefficient	P-value		Coefficient	P-value
Intercept	2106.38	3.6E-60	Intercept	1582.92	2.2E-40	Intercept	5074.04	0
Distance	-3.27	3.8E-01	Distance	1.97	5.8E-01	Distance	7.32	0.058064
Sub Type 1	79.85	1.5E-228	Sub Type 1	126.01	0.0E+00			
			Bedrooms	-36.67	2.6E-232	Bedrooms	-7.98	4.02E-11
Baths	-14.14	3.9E-40				Baths	3.30	0.013827
Yr Built	-1.00	3.0E-53	Yr Built	-0.71	3.2E-32	Yr Built	-2.49	0
2005	190.52	6.5E-40	2005	190.36	1.8E-42	2005	192.64	6.34E-38
2010	74.38	1.4E-07	2010	70.20	2.7E-07	2010	67.10	4.77E-06
2015	162.11	2.3E-30	2015	159.94	1.5E-31	2015	152.68	2.81E-25
2020	291.18	8.1E-93	2020	289.56	4.6E-98	2020	283.17	9.54E-82
2024	437.83	3.7E-202	2024	437.10	4.6E-215	2024	430.42	5.9E-182

Overall, removing property type dramatically changes the distance coefficient while removing bedrooms and bathrooms barely changes the models, confirming the importance of property type as shown in regression model “C.” The negative value shown in regression models “A” and the small positive value in “B” confirm that these two variables, number of bedrooms and number of bathrooms, does not significantly affect or mask the distance effect on property values.

The six years studied also show a strong correlation between housing prices in this study area and regional and national trends. As noted in the data, house prices were significantly down in 2010 which was the tail end of the “Great Recession” which depressed housing prices across the county. As regional pricing recovers, so do prices in the study area.

## CONCLUSIONS AND RECOMMENDATIONS

This analysis does not find a statistically significant relationship between proximity to the LA Metro G Line and residential property values within one mile of BRT stations, which mirrors the results that Acton, et al. (2022) found in 11 other US BRT systems. Other independent variables, particularly property type, square footage, and year sold are far more significant positive predictors of property price per square foot.

These results may be due to the G Line BRT not offering most of the positive accessibility features present in other BRT systems. The G line implementation ignores five essential design choices found in successful BRT systems and only delivers rail-like service. Poor integration of the BRT route and stations, lack of adjacent multifamily and mixed-use properties, and lack of density near stations all work against promoting positive property valuation effects, as noted in the literature (Acton, et al., 2022; Shen et al., 2018, Nelson & Hibberd 2021; Zhang et al., 2021).

The negligible effect that the BRT has had on property values does address fears of new BRT lines depressing housing prices and may calm concerns expressed by transit opponents. Future public outreach should emphasize that BRT does not hurt property values, and that better community integration of routes and stations may amplify positive valuation effects and outweigh potential nuisance effects such as reduced travel lanes.

Local government should also embrace high density, multifamily, mixed-use development near BRT stations. As now mandated by state law, higher density new

development has the potential of bringing new opportunities for positive economic effects generated by proximity to better transportation infrastructure.

## FURTHER RESEARCH

Recent new laws addressing use and density on parcels adjacent to BRT are expected to significantly change the land use in the study area. This research should be repeated in future years to understand the effects these new policies have on property valuation.

Future studies should also include rent prices and commercial properties to gain a better understanding of BRT effects on all properties.

Additionally, a difference-in-differences study should be conducted to compare property values near the G Line with similar properties not adjacent to the G Line to better separate specific and universal effects.

The planned extension to the G Line will be more community integrated, thereby offering a new data set of property values in proximity to better integrated BRT amenities. Comparing these datasets will offer additional insight into the overall economic value of BRT.

## Bibliography

Acton, B., Le, H. T. K., & Miller, H. J. (2022). Impacts of bus rapid transit (BRT) on residential property values: A comparative analysis of 11 U.S. BRT systems. *Journal of Transport Geography*, 100, 103324. <https://doi.org/10.1016/j.jtrangeo.2022.103324>

Beaudoin, J., & Tyndall, J. (2023). The effect of bus rapid transit on local home prices. *Research in Transportation Economics*, 102, 101370. <https://doi.org/10.1016/j.retrec.2023.101370>

Benson, J. L., & Cao, J. (2020). Did the A Line arterial bus rapid transit affect housing values in Ramsey County, MN? *Journal of Transport and Land Use*, 13(1), 55–72. <https://doi.org/10.32866/001c.16628>

California Regional Multiple Listing Service. (2024). CRMLS residential property transactions dataset. <https://go.crmls.org>

Covarrubias, A. (2005, October 18). Is a busway the Valley way? The region's Orange Line is ready to roll but some wonder if it will do much to curtail traffic. *Los Angeles Times*. <https://www.latimes.com/archives/la-xpm-2005-oct-18-me-orange18-story.html>

Nelson, A. C., & Hibberd, R. (2021). (Overlooked) association between express bus station/stop proximity and multifamily rents with a surprise about transit mode synergism. *Transportation Research Record*, 2675(12), 1–14. <https://doi.org/10.1177/036119812111005457>

Perk, V., Catalá, M., Mantius, M., & Corcoran, K. (2010). Impacts of bus rapid transit (BRT) on surrounding residential property values (Report No. NITC-RR-894). National Institute for Transportation and Communities. <https://doi.org/10.15760/trec.178>

Rosen, S. (1974). Hedonic prices and implicit markets: Product differentiation in pure competition. *Journal of Political Economy*, 82(1), 34–55. <https://doi.org/10.1086/260169>

Shen, Q., Xu, S., & Lin, J. (2018). Effects of bus transit-oriented development (BTOD) on single-family property value in the Seattle metropolitan area. *Urban Studies*, 55(13), 2960–2979. <https://doi.org/10.1177/0042098017729078>

Zhang, B., Li, W., Lownes, N., & Zhang, C. (2021). Estimating the impacts of proximity to public transportation on residential property values: An empirical analysis for Hartford and Stamford areas, Connecticut. *ISPRS International Journal of Geo-Information*, 10(2), 44. <https://doi.org/10.3390/ijgi10020044>