ECONOMIC IMPACT OF BILLBOARD LOCATIONS ON PROPERTY VALUES IN PHILADELPHIA

Report Submitted To:
Duane Morris LLP
30 South 17th Street
Philadelphia, PA 19103-4196

Report Submitted By:
Econsult Corporation
1435 Walnut Street Suite 300
Philadelphia PA 19102

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1. INTRODUCTION

Billboards are a common sight and a frequent type of advertising in urban landscapes. However, some recent research has purported to find that the presence of billboards has an adverse effect on the local economy.

More specifically, a recent paper[1] by Jonathan Snyder of the University of Pennsylvania conducted an empirical analysis using home sales in Philadelphia in 2010, and reports that:

> *"Properties purchased within 500 feet of billboards have a decrease in sale price of $30,286 and the correlation is statistically significant (p<=.05).[2]"*

The author's presumed motivation for this research is that "A review of the available literature reveals a dearth of information on the economic impact of outdoor advertising billboards on the surrounding community (sic)[3]". However, he does cite anecdotal evidence from other researchers, characterizing billboards as "visual pollution[4]" that "desecrate the landscape[5]".

In the interest of further helping to reduce this supposed dearth of research, we undertake a similar study that also uses home sales in Philadelphia to examine this issue, but use a fuller—and we believe, more advanced—empirical approach than what is deployed in the Snyder report.

More specifically, this paper utilizes the same regression-based approach as the Snyder report, using data on home sales and billboard locations in Philadelphia, but with three key differences:

- The data spans the years 2007-2011, unlike the Snyder report, which only uses sales from 2010.
- A fuller set of control variables on housing characteristics and their locational attributes are added to the regressions specification, whereas the Snyder report only uses five control variables.
- The value of homes both before and after nearby billboards are taken down is examined, whereas the Snyder report only examines the value of homes near billboards and further away from billboards.

[1] "*Beyond Aesthetics: How Billboards Affect Economic Prosperity*", Jonathan S. Snyder, Samuel S. Fels Fund (December 2011).
[2] Page 5 of above report.
[3] Page 1 of above report.
[4] Page 1 of above report.
[5] Page 2 of above report.

2. THE SNYDER REPORT

At the center of the Snyder report are the results from a regression of house prices on five control variables, plus a variable indicating whether a home is within 500 feet of a billboard location in Philadelphia. According to the author, the sales data are from the City's Recorder of Deeds, and the billboard location data are from the University of Pennsylvania's Cartographic Modeling Lab. The table that reports the regressions results in the Snyder report is pasted below:

Table 1. From Page 5 of the Snyder report

Statistical Model for the Price of Properties within 500 ft. of a Billboard

Model[22]		Unstandardized Coefficients		Standardized Coefficients		
		B[25]	Std. Error[26]	Beta[27]	t[23]	Sig.[24]
1	(Constant)	-4936882.57	315905.74		-15.628	.000
	Livable Area	89.34	.46	.820	195.084	.000
	Bike Path 1000 Ft	82254.61	11494.54	.030	7.156	.000
	Library 1000 Ft	120130.59	17703.46	.029	6.786	.000
	Park 1000 Ft	102946.99	11027.36	.040	9.336	.000
	Year Built	2510.88	162.52	.065	15.450	.000
	Billboard 500 Ft	-30825.85	14634.00	-.009	-2.106	.035

a. Dependent Variable: Sales Price

Source: "Beyond Aesthetics: How Billboards Affect Economic Prosperity", Jonathan S. Snyder, Samuel S. Fels Fund (December 2011). Page 5.

Regression coefficients state how the dependent variable changes in response to a unit increase in the independent variables. The t-values report whether or not this relationship is "statistically significant"; i.e. whether the coefficient is meaningfully different from zero. In this particular instance, the author states that the coefficient of -30825.85 indicates that if a dwelling is within 500 feet of a billboard, then it suffers an average decrease in sale price of $30,826. Moreover, the t-value of -2.106 and associated p-value of 0.035 indicates that this relationship is statistically significant at the 5% level[6].

Moreover, since the author controls for dwelling size, dwelling age and proximity to amenities like bike paths, parks and libraries, he is implicitly claiming that this result is not due the spurious locations or systematic variation in housing characteristics that are associated with

[6] In general, the generally accepted industry practice is that statistical significance is achieved at the 5% level. In practice, a t-value greater than +1.96 or less than -1.96, along with a p-value less than 0.05 is the empirical threshold to achieve this.

home located near billboards. For example, if it is the case that homes located near billboards are systematically smaller and older than homes not located near billboards, then adding these variables to the regression controls for this systematic difference, and the subsequent results compute the "true" effect of billboards on house values that is net of this systematic variation.

However, this regression can be critiqued for two potentially meaningful shortcomings that may affect its results:

1) **The number of control variables in the regression is exceptionally low.**
   There are only five control variables, and only two of them pertain to the actual structural (as opposed to locational) characteristics of the dwelling itself: size and age. In reality, dwellings have many other characteristics for which the ample research literature has shown affect a dwelling's total value: physical condition, lot size, density, number of stories, presence and number of fireplaces, whether or not it has a garage, type of exterior, etc[7].
2) **The location of billboards is implicitly assumed to be uncorrelated with most housing characteristics.**
   Since the purpose of billboards is to advertise products or services, it behooves the owner to locate the billboards where as many as eyes can see them as possible. This naturally would lead to locations where both population density and/or traffic counts are very high. Since density, congestion and noise are generally considered to be dis-amenities, house prices may be lower in these locations. Moreover, insofar as billboards themselves are considered dis-amenities (which the author implies via the research he cites), then wealthier neighborhoods are likely to resist their implementation there, whether it be through formal means (zoning or historic designations) or informal means (political and social influence).

This paper will attempt to build on Snyder's results by explicitly addressing these issues in the analysis.

3. DATA

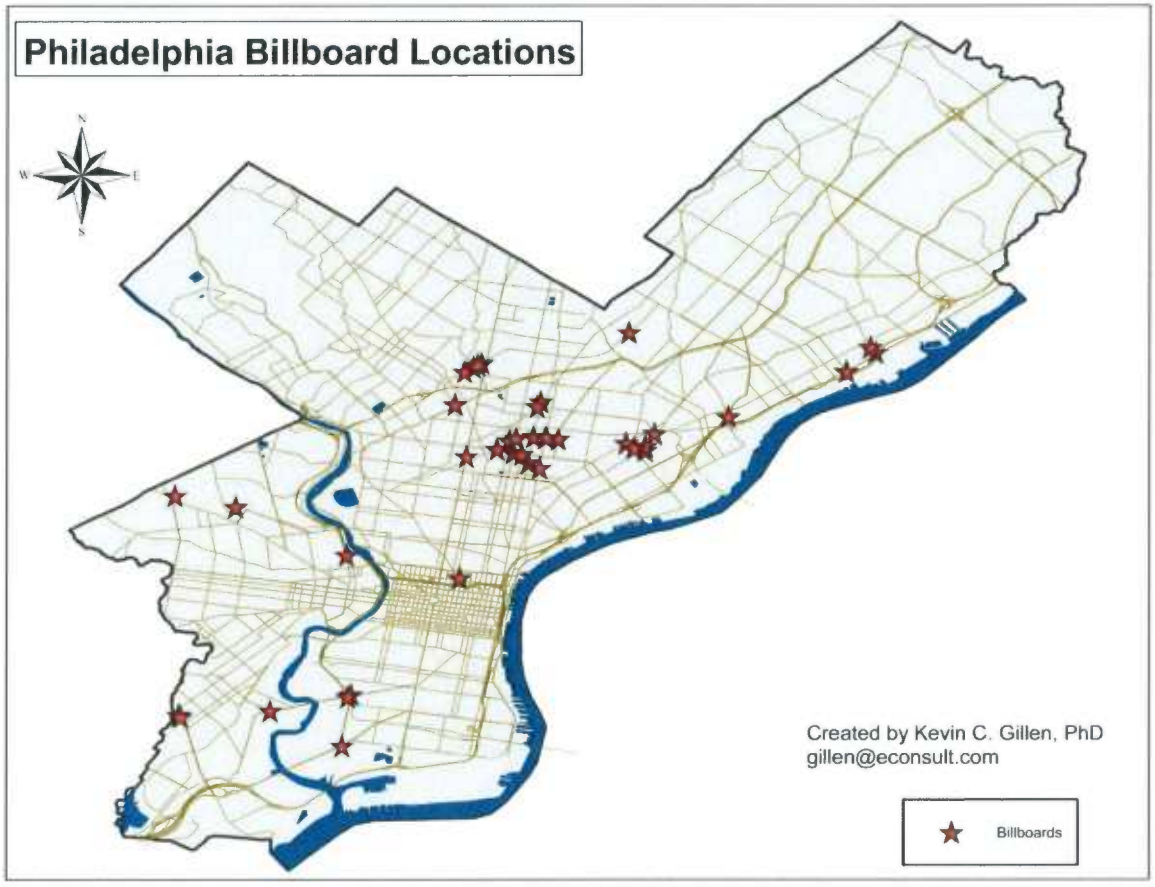
Using similar data as Snyder, this report first tries to replicate Snyder's results, and then attempts to extend them using a fuller empirical approach that addresses the two criticisms outlined in the previous section.

Like Snyder, home sales data was obtained from the City Recorder of Deeds. However, this data covers the five years from 2007 through 2011 in order to have a longer time series and

[7] See "*The hedonic price method in real estate and housing market research. A review of the literature.*" Herath, Shanaka and Maier, Gunther, WU Vienna University of Economics and Business, Vienna (2010) for a recent and thorough review of this literature.

larger dataset, which in turn should support more robust results. But, since we do not have access to the billboards data that is owned by the University of Pennsylvania, we obtained data from the CBS Outdoor Group, which represents the major railroad in our area and maintains the leases on the properties at which these billboards were located and maintained. In order to address the concerns over the Snyder study, we specifically requested billboards that were taken down (i.e. removed) in recent years. If billboards are indeed disproportionately located near homes that are lower-priced to begin with, then a regression with more control variables should be able to effectively capture this. However, if billboards still have an adverse effect on property values, even if they are located near relatively lower-priced homes to begin with, then the removal of billboards should have a positive effect on property values. Hence, measuring the change in the value of homes after nearby billboards are taken down is another, more effective way of addressing the issue of whether billboards do indeed have a deleterious effect on nearby property values.

Map 1. Billboard Locations in Philadelphia



Source: Clear Channel Outdoors

All 42 billboard locations and 70,000+ home sales were geo-coded with assistance of GIS software. The home sales data were then spatially joined to the billboards data to compute the distance from each home to the nearest billboard.

4. EMPIRICAL RESULTS I: SUMMARY STATISTICS

Using Snyder's definition of being "near" a billboard as being within 500 feet, the following table reports summary statistics on the homes in the sales data, comparing homes within 500 feet of a billboard to homes that are further away. The column labeled "Pct. Difference" reports the percent difference in the characteristics between the two types of homes.

Table 2 Average Values of Housing Characteristics

Variable	<=500 feet from Billboard Avg. Value	>500 feet from Billboard Avg. Value	Pct. Difference
Sale Price	$46,841	$136,150	-65.6%
Home Size (sqft)	1,138	1,362	-16.5%
<1000 feet of park	18.0%	17.2%	4.6%
Year Built	1931	1933	-0.1%
<500 feet of commercial corridor	13.1%	6.7%	95.2%
Tract Vacancy Rate	12.4%	9.8%	26.5%
Below Avg. Condition	7.6%	4.9%	54.2%
Inferior Condition	7.6%	3.6%	111.9%
Rental	46.4%	37.4%	24.1%
Detached	1.7%	4.1%	-57.6%
Rowhouse	91.0%	74.1%	22.8%
Semi-detached	1.7%	13.9%	-87.6%

Source: City Recorder of Deeds, Philadelphia Office of Property Assessment, U.S. Census

As can be directly observed from the table, homes near billboards do indeed have significantly lower values than homes further away from billboards. From 2007 to 2011, the average price of a home within 500 feet of a billboard was $46,841; nearly $90,000 (or 66%) less than the average price of home located more than 500 feet from a billboard. Note that this raw difference of $90,000 is substantially greater than the $30,286 amount reported by Snyder.

However, examining the other characteristics of this housing stock would seem to yield some insights as to why such a difference in price exists. First, we examine the three variables that are used as controls in the Snyder regression: size (square feet), the year built and proximity to

a park. While homes that are near billboards are slightly smaller than those further away (1,138 sqft v. 1,362 sqft), there does not appear to be any further meaningful differences in either their age (1931 v. 1933) or the percentage that are near parks (18.0% v. 17.2%). If this is also true for homes near billboards in the Snyder study, then the use of these variables as controls in the regression is redundant, as they are essentially constants across observations.

Examining the other housing characteristics, though, does reveal some meaningful differences in the housing characteristics. Homes that are within 500 feet of a billboards are more likely to be located near a commercial corridor (13.1% v. 6.7%), are in a neighborhood with a higher vacancy rate (12.4% v. 9.8%), have a higher probability of being classified by the city's assessor as being in "below average" or "inferior" condition (7.6% v. 4.9% and 3.6%, respectively), are more likely to be renter-occupied rather than owner-occupied (46.4% v. 37.4%) and are more likely to be an attached rowhome rather than a semi-detached or detached house (91.0% v. 74.1%).

These basic summary statistics would thus seem to point up two important stylized facts about not only the nature of homes that are near billboards, but about the previous research on this subject. First, homes that are near billboards are significantly more likely to have characteristics that are generally associated with lower house prices: being denser, being renter-occupied, being more depreciated and being located in neighborhoods with higher vacancy rates. Second, the Snyder report did not use any of these variables as controls in its regression, but rather chose those two variables (age and size) for which there does not appear to be any significant differences for homes that are near to v. far from billboards. This not only calls into question the results of the previous research, but suggests that further research in this subject area should take these stylized facts into account by incorporating a fuller set of control variables in any regressions.

5. EMPIRICAL RESULTS II: HEDONIC REGRESSION

Hedonic regression is a statistical technique that decomposes the total value of a good into the individual value of its constituent characteristics. In the case of housing, the sales price of the home is regressed on the physical and locational characteristics of the home. The resulting coefficients give the individual prices of those attributes. The regression reported in the Snyder study regesses house prices on a total of six characteristics, of which one is the variable of interest (proximity to billboards) and the other five are control variables. We repeat this same regression, and then add the additional control variables suggested by the analysis in the previous section to see how the results change as a consequence of estimating a fuller and more extensive regression. The results are presented in the following table. Each column reports the results of a single regression, with the t-value of each coefficient listed below its respective coefficient.

Table 3: Hedonic Regressions Variable	Description	Snyder Regression Est. Coeff. and t-value	Regression1 Est. Coeff. and t-value	Regression2 Est. Coeff. and t-value
Intercept	Intercept	-4936883	-669513	-911932
		-15.63	-19.27	-5.86
bldg_sqft	Square footage of house	89.34	115.1844	67.10304
		195.08	144.11	58.23
dist_park1000	Within 1,000 feet of a park	102947	59541	8469.86617
		9.336	54.82	10.05
yr_built	Year that house was built	2510.88	330.29271	576.89106
		15.45	18.38	7.24
dist_bboard500	Within 500 feet of billboard	-30825.85	-63286	-2658.80
		-2.106	-9.9	-0.72
Bike Path 1000 ft	Within 1,000 feet of bike path	82255.61	N/A	N/A
		7.156		
Library 1000 ft	Within 1,000 feet of library	120130.59	N/A	N/A
		6.786		
Other Control Variables?		No	No	Yes
Number of obs.	No. of observations	Unknown	71,634	71,634
Adj. R-Sq	Adjusted R-Squared	Unknown	0.267	0.7817
F-value	F-test for Ho: dist_bboard500=0	N/A	98.03	0.52
Pr > F	p-value for F-Test	N/A	<.0001	0.4689

The column labeled "Snyder regression" repeats the same results as in Table 1, which is directly from the Snyder report. Snyder's estimated coefficient on dist_bboard500 indicates that homes within 500 feet of a billboard have a value that is $30,826 less than the other homes in the data, controlling for other things. The column labeled "Regression 1" repeats this same regression using data on 2007-2011 home sales and the Clear Channel billboards[8]. Like Snyder, this regression also finds positive and significant effects for home size, year built and proximity to a park. Additionally, the coefficient on proximity to billboards indicates that being within 500 feet of a billboard is associated with a house being worth an average of $63,286 less than the other homes in the data; more than twice the discount found by Snyder. Moreover, the t-value of 9.9 is several times the t-value of 2.1 reported by Snyder, and indicates very strong statistical significance. Lastly, the reported F-statistic, which tests the null hypothesis that this coefficient

[8] We did not include proximity to bike paths or libraries in the regression because we did not have access to such data. However, this is unlikely to make a difference and there is no particular reason to question these results in the Snyder report.

is equal to zero (i.e. being near billboards has no effect on house values) has a p-value of <.0001, which strongly and formally rejects this hypothesis.

However, when the other control variables are added to the regression, this result completely goes away[9]. In the column labeled "Regression 2", the estimated coefficient on dist_bboard500 is now only 2,659, which is significantly deflated from the previous regression. Moreover, the t-value of -0.72 is not even close to being considered statistically significant, and this is further supported by the results of the F-test, which fail to reject the null hypothesis. Hence, the regression indicates that, when other aspects of housing a controlled for, proximity to a billboard is not associated with house values being any different from house values anywhere else in Philadelphia. This evidence suggests that, while house values near billboards may be lower than average house values in Philadelphia, it is due to the relatively less desirable characteristics of this housing and their neighborhoods, and that proximity to a billboard has zero effect on house values.

6. EMPIRICAL RESULTS III: EVENT STUDY REGRESSION

Since the data on 42 billboard locations used in this analysis is but a subset of the total universe of billboards in Philadelphia, it may be the case that they may be an unrepresentative sample. For example, if these particular billboards are disproportionately located near relatively higher-priced homes, then that may be what is driving the regression result indicating that proximity to billboards may have no effect on house prices. Although the summary statistics and the simple regression overwhelmingly indicate that this is not the case, we now estimate an additional set of regressions to see if the results hold. In particular, we examine whether the removal of a billboard is associated with any change in the values of nearby homes.

If the presence of billboards does indeed have a negative effect on house prices, then it follows that their removal should see a subsequent positive effect. Since all of the billboards in our data were taken down during the 2007-2011 period, and the date of their removal is known, then it is possible to explicitly examine for such an effect. We estimate an event study regression that explicitly tests for any change in the level and trend of house prices, both before and after their removal. The event study variables are defined and calculated as follows:

Pre_bboard500 = 1 if a home is <500 feet of any billboard location, =0 otherwise.
Pre_bboardt500 = 1,2,...,20 if a home is <500 feet of any billboard location and the home transacted in the time period 1,2,...,20, =0 otherwise.
Post_bboard500 = 1 if a home is <500 feet of any former billboard location, =0 otherwise.

[9] The other control variables include those analyzed in the Summary Statistics section of the report, plus many others. Due to the length of the regression output, the full regression results are relegated to the appendix of this report, with only the pertinent variables of interest being reported here.

Post_bboardt500 = number of time periods that have passed since the billboard was taken down and a home is <500 feet of any former billboard location, =0 otherwise.

The interpretation of these variables is as follows:
Pre_bboard500 is a simply dummy variable measuring the general level of house prices near billboards.
Pre_bboardt500 is a time trend[10] variable measuring the general trend in house prices near billboards.
Post_bboard500 is a simply dummy variable measuring the general level of house prices near billboards after the billboard is taken down.
Post_bboardt500 is a time trend variable measuring the general trend in house prices near billboards after the billboard is taken down.

If both the presence of billboards and their removal has any effect, the coefficients on these variables will be statistically significant. We estimate the previous hedonic regression with these variables replacing dist_bboard500 in the specification, and also perform F-tests that test the null hypothesis that their coefficients are equal to zero. The regression is estimated two ways: Regression 3 uses the same control variables as used in the Snyder report, while Regression 4 uses the same full set of control variables used in Regression 2 of the previous section. The results are reported in the following table.

[10] This variable takes on an integer value between 1 and 20 denoting what year and quarter a home transacted in. Since the data spans the five years from 2007 to 2011, and there are four quarters in a year, then 5x4=20. So, a value of "1" denotes that home transacted in 2007Q1, a value of "2" denotes that it transacted in 2007Q2,…,and a value of "20" denotes that it transacted in 2011Q4.

Table 4: Event Study Regressions Variable	Description	Regression 3 Est. Coeff. and t-value	Regression 4 Est. Coeff. and t-value
Intercept	Intercept	-672020	-911460
		-19.33	-5.86
bldg_sqft	Square footage of house	115.34752	67.13773
		144.28	58.25
dist_park1000	Within 1,000 feet of a park	59448	8467.55563
		54.71	10.04
yr_built	Year that house was built	331.40245	576.71373
		18.44	7.24
pre_bboard500	Within 500 feet of billboard location	-66525	8744.30802
		-1.55	0.37
pre_bboardt500	Time period of transaction <500 ft	-451.77617	4117.68732
		-0.03	0.43
post_bboard500	Within 500 feet of former billboard	10190	4741.41563
	location	0.21	0.18
post_bboardt500	Number of time periods since	-56144	-36057
	billboard was taken down	-1.37	-1.6
Other Control Variables?		No	Yes
N	No. of observations	71,634	71,634
Adj. R-Sq	Adjusted R-Squared	0.2664	0.7817
F-value	F-test for Ho: pre_bboard500=0	2.4	0.14
Pr > F	p-value for above F-Test	0.1213	0.7103
F-value	F-test for Ho: pre_bboardt500=0	0	0.18
Pr > F	p-value for above F-Test	0.9796	0.6701
F-value	F-test for Ho: post_bboard500=0	0.04	0.03
Pr > F	p-value for above F-Test	0.8337	0.8581
F-value	F-test for Ho: post_bboardt500=0	1.87	2.58
Pr > F	p-value for above F-Test	0.1717	0.1085

As regression 3 indicates, homes within 500 feet of a billboard have an average discount of $66,525. However, with a t-value of 1.55 and F-value of 2.4, this effect is only significant at the 12% level. This would typically be considered close to being statistically significant, but not quite (10% is usually the minimum threshold). None of the remaining variables meet the threshold for statistical significance, and hence are not considered to be meaningfully different from zero.

In regression 4, which includes the full set of control variables, the pre-takedown variables are a positive number. This would indicate that homes near an existing billboard actually have a price premium. However, neither of these variables is statistically significant. The only variable that comes close to being significant is post_bboardt500. With a t-value of -1.6 and F-test of 2.58, this variable is just shy of being significant at the 10% level (its p-value is 10.85%). However, the value of its coefficient is -36,057, which indicates the house prices decline by $36,057 in the periods after a billboard's removal. If true, this would imply that the proximity to existing billboards would have a positive effect on house prices, which is in direct contrast to the Snyder report.

In short, the results indicate that, even controlling for other housing characteristics, the construction and demolition of billboards do not appear to have any meaningful effect on movements in the values of nearby homes.

7. CONCLUSION

The Snyder report purports to find that the nearby presence of billboards has an adverse effect on house values in Philadelphia. While the raw data does indicate that average house prices within 500 feet of a billboard are lower than the average house price for the city, the author does not sufficiently address the fact that billboards are generally located on major commercial corridors where house prices are typically lower, and that these homes have systematic differences in their structural characteristics that are also associated with lower values. When these attributes are adequately controlled for in a hedonic regression, the results indicate that proximity to a billboard has no meaningful effect on house values one way or the other. Moreover, an additional event study regression which examined house price movements before and after billboards were taken down found that, if anything, proximity to billboards actually has a positive effect on house values. However, none of the variables met the threshold for statistical significance at the 5% level. Thus, the data indicates that when the locational and physical attributes of housing are sufficiently controlled for, the nearby presence of billboards has no effect on house values.

APPENDIX

Full Hedonic Regression Output

Variable	Est. Coeff.	Std. Error	t Value	Pr > |t|
Intercept	-911932	155499	-5.86	<.0001
bldg_sqft	67.10304	1.15234	58.23	<.0001
dist_park1000	8469.8662	843.0065	10.05	<.0001
yr_built	576.89106	79.66906	7.24	<.0001
dist_bboard500	-2658.801	3670.987	-0.72	0.4689
dist_commcorr500_mjr	-235.7456	1040.995	-0.23	0.8208
vac_rate	-10551	7296.717	-1.45	0.1482
ln_lotsqft	11304	1771.415	6.38	<.0001
FAR	-22266	1769.55	-12.58	<.0001
ratio_frt_sqft	437960	113017	3.88	0.0001
one_fire	21375	2028.748	10.54	<.0001
two_fire	128719	6100.996	21.1	<.0001
threepl_fire	166525	7305.678	22.79	<.0001
ln_dist_cbd	-73316	4218.017	-17.38	<.0001
corner_dum	-47.61793	1130.523	-0.04	0.9664
cond_superior	37735	1523.399	24.77	<.0001
cond_above_avg	14021	1308.297	10.72	<.0001
cond_below_avg	-15228	1081.68	-14.08	<.0001
cond_inferior	-16107	1247.906	-12.91	<.0001
central_air	17451	1098.996	15.88	<.0001
rental	-9368.511	504.7298	-18.56	<.0001
garage	12955	741.3954	17.47	<.0001
brick	-29736	15454	-1.92	0.0543
frame	-6562.861	1842.899	-3.56	0.0004
masother	-3661.608	1415.813	-2.59	0.0097
stone	3508.6504	1919.651	1.83	0.0676
oneh_story	-2507.097	2871.671	-0.87	0.3826
two_story	-55.68056	1528.501	-0.04	0.9709
twoh_story	3108.1911	2413.244	1.29	0.1978
three_story	-2050.528	1874.223	-1.09	0.2739
threeplus_story	178502	3750.085	47.6	<.0001
apt_house	34271	7683.674	4.46	<.0001
detached	53710	7761.863	6.92	<.0001
row_house	39728	7635.621	5.2	<.0001
semi_detached	38870	7652.626	5.08	<.0001
age_dev	-507.4296	78.87128	-6.43	<.0001
abate_imprvd	78873	4344.276	18.16	<.0001

abate_new	86930	3250.042	26.75	<.0001
spring	-312.8174	836.713	-0.37	0.7085
summer	3481.5312	939.6604	3.71	0.0002
autumn	-139.6501	831.2373	-0.17	0.8666
repsale1	35207	698.169	50.43	<.0001
repsale2	20041	685.4764	29.24	<.0001
repsale3	14534	713.7669	20.36	<.0001
repsale4	8666.1636	650.009	13.33	<.0001
year_qtr_2	2124.8917	1274.202	1.67	0.0954
year_qtr_3	1832.2202	1365.314	1.34	0.1796
year_qtr_4	-293.63	1353.575	-0.22	0.8283
year_qtr_5	-3281.342	1301.981	-2.52	0.0117
year_qtr_6	-2996.215	1354.588	-2.21	0.027
year_qtr_7	-3013.347	1434.274	-2.1	0.0356
year_qtr_8	-4713.461	1464.04	-3.22	0.0013
year_qtr_9	-12590	1507.602	-8.35	<.0001
year_qtr_10	-7468.63	1455.226	-5.13	<.0001
year_qtr_11	-7068.016	1468.772	-4.81	<.0001
year_qtr_12	-5775.687	1387.773	-4.16	<.0001
year_qtr_13	-11334	1450.788	-7.81	<.0001
year_qtr_14	-6554.88	1381.666	-4.74	<.0001
year_qtr_15	-13016	1538.706	-8.46	<.0001
year_qtr_16	-15685	1537.744	-10.2	<.0001
year_qtr_17	-14555	1504.749	-9.67	<.0001
year_qtr_18	-14055	1455.261	-9.66	<.0001
year_qtr_19	-18667	1564.021	-11.94	<.0001
year_qtr_20	-17085	1532.522	-11.15	<.0001
Include Tract-level dummies?	Yes			

Full Event Study Regression Output

Variable	Est. Coeff.	Std. Error	t Value	Pr > |t|
Intercept	-911460	155501	-5.86	<.0001
bldg_sqft	67.13773	1.15257	58.25	<.0001
dist_park1000	8467.5556	843.00228	10.04	<.0001
yr_built	576.71373	79.67011	7.24	<.0001
pre_bboard500	8744.308	23541	0.37	0.7103
pre_bboardt500	4117.6873	9665.8704	0.43	0.6701
post_bboard500	4741.4156	26528	0.18	0.8581
post_bboardt500	-36057	22467	-1.6	0.1085
dist_commcorr500_mjr	-243.07977	1041.1083	-0.23	0.8154
vac_rate	-10580	7296.8738	-1.45	0.1471
ln_lotsqft	11283	1771.6709	6.37	<.0001
FAR	-22277	1769.6289	-12.59	<.0001
ratio_frt_sqft	437357	113019	3.87	0.0001
one_fire	21372	2028.7605	10.53	<.0001
two_fire	128705	6101.0321	21.1	<.0001
threepl_fire	166497	7305.7283	22.79	<.0001
ln_dist_cbd	-73295	4218.1919	-17.38	<.0001
corner_dum	-39.26678	1130.6467	-0.03	0.9723
cond_superior	37734	1523.4104	24.77	<.0001
cond_above_avg	14015	1308.3199	10.71	<.0001
cond_below_avg	-15230	1081.7065	-14.08	<.0001
cond_inferior	-16115	1247.9428	-12.91	<.0001
central_air	17454	1099.0047	15.88	<.0001
rental	-9369.0868	504.73238	-18.56	<.0001
garage	12959	741.43413	17.48	<.0001
brick	-29724	15454	-1.92	0.0544
frame	-6571.1765	1842.9246	-3.57	0.0004
masother	-3667.8195	1415.8325	-2.59	0.0096
stone	3500.7193	1919.6677	1.82	0.0682
oneh_story	-2472.9294	2871.8057	-0.86	0.3892
two_story	-71.90159	1528.5365	-0.05	0.9625
twoh_story	3079.5152	2413.2547	1.28	0.2019
three_story	-2078.8862	1874.2846	-1.11	0.2674
threeplus_story	178449	3750.1416	47.58	<.0001
apt_house	34281	7683.7305	4.46	<.0001
detached	53729	7761.9586	6.92	<.0001
row_house	39745	7635.6784	5.21	<.0001
semi_detached	38892	7652.6914	5.08	<.0001
age_dev	-507.4167	78.87204	-6.43	<.0001

abate_imprvd	78868	4344.2953	18.15	<.0001
abate_new	86933	3250.0689	26.75	<.0001
spring	-310.23415	836.7325	-0.37	0.7108
summer	3479.6083	939.67417	3.7	0.0002
autumn	-143.05636	831.25409	-0.17	0.8634
repsale1	35208	698.17842	50.43	<.0001
repsale2	20038	685.48088	29.23	<.0001
repsale3	14532	713.775	20.36	<.0001
repsale4	8666.5066	650.00689	13.33	<.0001
year_qtr_2	2125.8722	1274.2084	1.67	0.0952
year_qtr_3	1837.1684	1365.3242	1.35	0.1784
year_qtr_4	-294.60651	1353.5631	-0.22	0.8277
year_qtr_5	-3296.5668	1302.0782	-2.53	0.0114
year_qtr_6	-3003.1173	1354.6957	-2.22	0.0266
year_qtr_7	-3021.5407	1434.3888	-2.11	0.0352
year_qtr_8	-4721.1265	1464.1907	-3.22	0.0013
year_qtr_9	-12599	1507.8709	-8.36	<.0001
year_qtr_10	-7479.1924	1455.366	-5.14	<.0001
year_qtr_11	-7074.0562	1468.9789	-4.82	<.0001
year_qtr_12	-5780.8038	1388.0201	-4.16	<.0001
year_qtr_13	-11354	1450.9806	-7.83	<.0001
year_qtr_14	-6578.7702	1381.9786	-4.76	<.0001
year_qtr_15	-13037	1538.9556	-8.47	<.0001
year_qtr_16	-15684	1537.7454	-10.2	<.0001
year_qtr_17	-14508	1505.0399	-9.64	<.0001
year_qtr_18	-14020	1455.4589	-9.63	<.0001
year_qtr_19	-18658	1564.0337	-11.93	<.0001
year_qtr_20	-17057	1532.5959	-11.13	<.0001