Fall 2008

Predicting Days On Market: The Influence Of Environmental And Home Attributes

Robert P. Culp*

ABSTRACT

This paper estimates the difference in the number of days a home will remain on the market based upon its environmental attributes. Using on-site inspections of 3088 home sites, the results, using two-stage least squares, show that time on market is reduced and price increased by a variety of green features such as trees, landscaping, open spaces and parks, while time on market is increased and/or price decreased by man-made obstructions such as power lines, roads near the home, train tracks, and apartments. This research finds home orientation to and not just the distance from roads has a significant impact on home price and time on market regardless of traffic volume. Apartments in view are found to significantly reduce home prices and increase time on market while cathedral ceilings increased home price. Homes in subdivisions were found to sell for higher prices and sell more quickly while the price of homes was not influenced by a hill obstructing the rear even though time on market was significantly increased.

INTRODUCTION

While much analysis has been done on how environmental and various other attributes influence the selling price of a home, less work has been done examining the factors influencing time on market. Time on market, the time from when a home is listed until there is an agreement for sale, can be very important to homeowners and to real estate agents. For the homeowner there are real costs. The homeowner may have to maintain two residences with two mortgage payments. It might also be necessary to maintain a show appearance for the home and make time available for visits by potential buyers. The homeowner may also have to maintain the yard and garden until the home sells. Additionally, some homeowners may not be able to purchase their desired new residences until their current home has sold. Besides the real costs, additional time on market has emotional costs. Homeowners unable to sell their homes in a timely fashion may experience emotional distress from financial concerns, being unable to schedule movers or make various other moving preparations, and from not knowing if they will be able to meet various important deadlines such as school or job start dates. For real estate agents, homes that stay on the market longer mean that the real estate agent must devote more time and resources for each sale and may cause the loss of potential future clients who may question the agent's effectiveness.

---

*Penn State University –Lehigh Valley

♢This author would like to thank the Lehigh Valley Association of Realtors for providing multi-list sales data used in this study and for the anonymous reviewers for their valuable suggestions.

Time on market is also critical for builders and developers. Extra time on market means extra interest costs. Additionally, builders who build on speculation, particularly small builders who have borrowing constraints, may not be able to obtain funds to construct a new home until their inventory of existing homes has sold. These factors reduce profitability. This paper examines how various environmental attributes whether man-made or green features influence time on market and market price. Time on market is examined in a form that allows for easy interpretation of not only whether a feature will increase or reduce time on market but also estimates the expected additional time on market for each feature.

PREVIOUS RESEARCH

While a significant amount of work has been done to examine the impact of environmental attributes on home price, few of these papers involve actual physical inspection of the area surrounding each home, and fewer still have examined how environmental attributes influence time on market. Instead, most papers examining environmental attributes perform simple hedonic valuation using geographic information systems (GIS) data to determine the proximity of each home to various structures such as roads, schools, shopping, and parks so the value of these attributes can be obtained.

The advantage of a GIS approach is that data collection is easy and these studies can obtain large samples. However, physical inspections of each home can provide more detailed information about tree cover, views, home orientation, and obstructions that are not available in GIS reports. The amount of recent research done using physical inspections is very limited. While MLS data include physical inspections of some basic home features, these inspections do not typically or consistently include information regarding trees and landscaping, the home's proximity to parks, roads, or man-made structures. Much of the previous research has examined the role of environmental attributes in home prices, but has not examined time on market. For example, Des Rosiers et al. (2002) examine how home prices are influenced by landscaping and tree cover. Later, Des Rosiers (2002) examines how power lines influence home prices while Bourassa, Hoesli, and Sun (2005) estimate the value of water views, the value of neighborhood improvements, and the value of landscaping in the neighborhood by hedonic valuation.

While recent research using physical inspections has been limited, research into how environmental attributes influence time on market has been done by only a handful of researchers. Haurin (1988) examined how time on market was influenced by the uniqueness of a home's attributes. He developed an atypical index to describe the relative uniqueness of homes and found that homes with atypical features had increased time on market. Haurin only examined time on market in relation to his index. He did not examine each attribute individually and only examined the environmental impact of roads and views. He did not consider other environmental attributes or home orientation to

those roads. Jud and Frew (1990) use Haurin's atypical index to estimate apartment vacancies and find results similar to Haurin's work on homes. Glower, Haurin, and Hendershott (1998) examine how seller motivation influences time on market using Haurin's index. Anglin, Rutherford and Springer (2003) found in their empirical study that higher listing prices increase time on market. More recently, Allen, Faircloth and Rutherford (2005) found that setting a range of prices rather than one listing price did not reduce time on market. However, none of these papers closely examined environmental attributes. An exception is Ong and Koh (2000) who examine time on market for high-rise flats. Although they find that flat owners with the best views keep their homes on the market longer to obtain a higher price, they do not examine any other environmental attribute.

Other papers examining time on market have approached the topic from a theoretical perspective, such as Miceli (1989) and Geltner, Kluger, and Miller (1991) who examine optimal contact theory, or Taylor (1999) who examines theoretically how setting a listing price can be a signal to buyers of quality, or Genesove and Mayer (2001) who find sellers expecting to sell at a loss in nominal terms will set their list price at a higher value and will tend to obtain a higher price than those not expecting to sell at a loss.

DATA AND MODEL

While time to sale data is usually analyzed using hazard or survival models, these models provide results in probability terms and do not estimate time to sale. For example, a hazard model can indicate a home with a particular attribute will be 10 percent more likely to sell before a home without that attribute but is not able to estimate how much more quickly the home will sell. A common misinterpretation of hazard model results is to conclude that if a home is 10 percent more likely to sell before another home, that it will therefore sell 10 percent more quickly. This is not the case. The average difference in time on market could be virtually identical or could be significantly shorter. For example, suppose two sprinters are compared and one is 10 percent more likely to win than the other. This does not mean that the first sprinter is 10 percent faster on average, only that he is more likely to finish first by some unknown amount.

For people involved in real estate, it is not enough to know that a home with a certain attribute will take longer to sell; they need to know how much longer it will take to sell. So while hazard models can be very useful, applying them to the real estate market does not provide very useful information.

Accordingly, rather than using a hazard or survival model, this paper will use standard regression procedures to estimate time on the market. While hazard models are more efficient, linear models are appropriate and have frequently been used to model time on market. Additionally, recent research by McElroy et al. (2005) comparing hazard model estimates to linear measures shows that linear measures are robust for estimating survival time. While a simple ordinary least square model could be used to estimate time on market, this approach ignores the interdependence between how long a home stays on the market and its selling price and between selling price and how long the owner

decides to keeps the home on the market. Therefore, given the interaction between these two variables, this paper will use a two equation system estimating time on market and selling price simultaneously.

Using this approach will allow for estimates of each home's predicted time on market depending upon the individual characteristics of the home while taking into account each home's selling price.

The home price equation (1) can be written as:

$$\ln(SP_i) = \alpha + \beta X_{Pi} + \theta \ln(DOM_i) + \psi(LP) + \varepsilon_i \qquad (1)$$

where SP_i represents the selling price of the ith property, X_{Pi} represents a vector of each home's physical, environmental, and time variables, ln(DOM) represents the natural logarithm of the number of days the property was on the market, and LP is the list price to account for home over pricing. The days on market equation (2) is written as:

$$\ln(DOM_i) = \gamma + \pi \ln(SP_i) + \eta X_{Di} + \varphi (LP) + \nu_i, \qquad (2)$$

Where X_{Di} represents a vector of the property attributes and time variables to control for the quarter in which the home was sold. LP is the list price of the home to account for the extra time on market for higher priced homes.

The selling price is the price at which the transaction occurred without regard to the actual amount the home homeowner nets after paying commission and fees. The coefficients of these equations are estimated using two-stage least squares (2SLS), following the method applied by Munneke and Yavas (2001) with location and time data (the quarter in which the home sold) being used as instrument variables for the 2SLS.

The data consist of 3088 home sales occurring in the Parkland School District in Lehigh County, Pennsylvania between the summer of 1999 and the summer of 2005. Lehigh County is located close to New Jersey in eastern Pennsylvania; 88 miles from New York City. The area has seen an increase in population from residents relocating from New Jersey to take advantage of the area's relatively low cost of living. While the school district's average income in 2006 of $59,419 (VISC, 2008) is higher than in the surrounding rural areas, it is very comparable to other suburban districts in the region and slightly below the New Jersey median household income of $65,370 (U.S. Census) The 1999-2005 time period saw home prices in the Lehigh Valley rise and does not include the decline in home prices that occurred by 2007. The sales data and various home attributes were obtained from the local multi-list service, Lehigh Valley Association of Realtors. The environmental data were obtained by this researcher examining the exterior of 3122 homes from Fall 2005 to Spring 2006 to determine the various environmental attributes possessed by each home. One limitation of the method of data

collection is that these homes were observed in winter of 2005-2006 and not at the time of sale. Some fast-changing attributes such as landscaping may have changed in some cases. Other factors such as new roads, apartments, and parks are known not to have significantly changed over the period covered by this study, however, traffic patterns and volume of traffic changes could have changed during the examined period. Therefore, some caution should be used when evaluating these outcomes.

After removing home observations which had missing information, 3088 observations remained. A description of each variable considered is shown in Appendix 1 and the final model results are shown in Table 1. Variables were eliminated using the backward elimination procedure in the regression software. This procedure removed variables not satisfying the incremental F test at a 5 percent level of significance. Therefore, the results in Table 1 show only variables explaining a significant amount of the variation in time on market or market price with the exception of attributes that described the magnitude of an attribute, such as the number of tree lines or the frequency of car traffic. These variables were kept in the model for comparison purposes.

ANALYSIS OF RESULTS

The results of the simultaneous system of equations are shown in Table 1. Since the time on market equation is in natural logarithmic form, interpreting each attribute's impact on time on market varies depending upon the magnitude of the other coefficients. The coefficients of Table 1 provide an estimate of the percentage change in price and time on market for a change in each attribute.

While the R square for the time on market (TOM) equation is low, this result is not unexpected given the underlying variation of the data and is consistent the R squares obtained from prior research, and as the F statistic shows, the model is significant. ANOVA results are presented in Table 2. The coefficients from the regression results are of the expected sign for the statistically significant environmental attributes with views and parks, trees and landscaping, and roads and man-made structures all having a significant impact on home price and time on market. The one exception is that mid volume roads in front of the home were found to increase home price. One would have expected that a more frequently traveled road would create noise or privacy issues and reduce home price. Perhaps homes on these more frequently traveled routes gain more exposure to potential home buyers and thus sell for higher prices or maybe these homes are situated closer to shopping features that home buyers enjoy.

Trees and Landscaping

Of the tree features, tree lines on three sides had the largest impact on time on market but little impact on price. Time on market for these homes is reduced by more than 50 percent compared to a home without a tree line on three sides. Homes with tree lines on fewer than three sides had no statistically

Table 1: Regression Results

	Dependent Variable:		t stat and Sig. for Price		t stat and Sig. for T.O.M	
Attributes[1]	**LNTOM**	**LNPrice**	**t**	**Sig.**	**t**	**Sig.**
Trees and Landscaping						
Tree Line: One Side	-.070	.009	.988	.323	-1.321	.187
Two Sides	.064	.022	1.446	.148	.699	.484
Three Sides	-.517*	.017	.442	.659	-2.651	.008
Trees Overhang: One	-.073	-.037*	-2.454	.014	-.817	.414
Two Sides	-.280	.004	.147	.883	-1.905	.057
Three Sides	.018	.006	.165	.869	.088	.930
Four Sides	-.035	-.049	-1.263	.207	-.150	.881
Tall Mature Trees	-.073	.031*	3.414	.001	-1.399	.162
Large Trees Back	-.120*	.003	.310	.756	-2.247	.025
Mat. Landscaping	-.210*	.025*	2.248	.025	-4.160	.000
Views, Parks, Orientation, and Neighborhood						
Park Near	-.370*	.044*	2.629	.009	-6.330	.000
Green space	-.037	.022	1.927	.054	-.547	.584
Partial View	-.046	.047*	4.762	.000	-.786	.432
View	.054	.048*	4.236	.000	.800	.424
Impressive View	-.146	.040*	2.873	.004	-1.888	.059
In subdivision	-.328*	.041*	2.272	.023	-4.006	.000
Cul-de-sac	.094	-.004	-.233	.815	.990	.322
Corner	.079	.013	1.179	.238	1.255	.210
Hill Obstructs Rear	.266*	.001	.088	.930	4.027	.000
Roads and Man-Made Structures						
Road Front: High	.144	.002	.115	.909	1.177	.239
Mid	-.005	.041*	2.335	.020	-.045	.964
Low	.046	-.016	-1.003	.316	.503	.615
Road Back: High	.427*	-.049	-1.834	.067	3.292	.001
Mid	.501*	-.050	-1.565	.118	3.210	.001
Low	.224	-.033	-1.264	.206	1.500	.134
Power Back Major	.342	-.042	-1.207	.228	1.774	.076
Power Front Major	.502	-.086	-1.038	.299	1.046	.296
Highway View	-.025	-.004	-.297	.767	-.319	.750
Train Tracks	.729*	-.031	-.579	.562	2.649	.008
Apartments in View	.388*	-.090*	-4.065	.000	3.790	.000
Home's Physical Characteristics						
Central AC	-.027	.080*	6.543	.000	-.369	.712
Cathedral Ceilings	-.097	.033*	3.221	.001	-1.714	.087
Number of Cars	.012	.041*	9.666	.000	.497	.619
Fireplace Number	.102*	.037*	4.777	.000	2.518	.012
Years Old	-.001	-.002*	-10.190	.000	-.952	.341
Sq. Footage (1000s)	.007	.021	1.905	.057	1.026	.305
Stories	.065	-.002	-.269	.788	1.793	.073
Number Bathrooms	.185*	-.004	-.490	.624	7.828	.000
Heat Pump	-.002	-.033*	-3.930	.000	-.040	.968
LnPrice (1000s)	.003*				9.121	.000
LnTOM		.035	.960	.337		
Listing Price (1000s)	.003*				25.495	.000
Adjusted R Square	.227	.833				

[1] Quarter and Location Variables Omitted for Brevity

* Significant at the 5 percent level

Table 2:

ANOVA

Dependent Variable: LNTOM

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1300.498	65	20.008	14.943	.000
Residual	4046.197	3022	1.339		
Total	5346.694	3087			

ANOVA

Dependent Variable: LNPrice

	Sum of Squares	df	Mean Square	F	Sig.
Regression	582.007	66	8.818	234.456	.000
Residual	113.625	3021	.038		
Total	695.632	3087			

significant impact on price or time on market, i.e. we cannot conclude they sold faster or at a higher price. The enhanced value of the tree line on three sides may result from the extra privacy a tree line on three sides provides.

The largest estimated impact on price from trees and landscaping is trees overhanging on one side. This feature reduced home price by an estimated 3.7 percent while mature trees on the property added an estimated 3.1 percent to home price. Even though trees overhanging a home have been shown to reduce air-conditioning costs, the limited aesthetic value of non-landscaping trees and the potential for debris from these trees may explain their negative impact on price. Previous research by Des Rosiers et al. (2002) showed that as tree coverage increased value increased until the coverage became excessive then value declined. The explanation for this outcome is that trees provide much needed shade and privacy but too many trees block out too much of the sun, potentially creating a dark and gloomy environment. The results in this paper are consistent with Des Rosiers' work. The analysis found that homes with trees overhanging on four sides lost 4.9 percent of their value.

Large trees in the rear of the home reduced time on market but had no significant impact on price perhaps because large trees may also increase the home owner's potential maintenance and liability costs or simply because nearly 42 percent of homes in the Parkland school district have large trees in the rear and therefore these are not a selling feature of the home. Finally, landscaping reduces estimated time on market by 21 percent and increased home selling price by 2.5 percent. Similar results were found for mature trees which reduced time on market by 7.3 percent and increased home price by 3.1 percent. While this result is slightly lower than results reported in the American Nursery & Landscape Association (ANLA) fact sheet of a 7 percent increase in home price for landscaping of

"excellent" quality, the difference may result from the fact that the data used for this paper did not attempt to quantify whether landscaping quality was "excellent".

Views, Parks, Orientation, and Neighborhood

According to the regression results, as one might expect, views from the home had a significant impact on home price. In fact, homes rated as having an impressive view, meaning one can see an estimated three miles from the home, increased home price by an estimated 4 percent with lesser views also increasing home price. Only homes with impressive views were found to have a significant reduction in time on market—reducing time on market by an estimated 14.6 percent.

While being located near a park added an estimated 4.4 percent to the home's value and reduced time on market by 37 percent, a park located behind the home was statistically insignificant and was dropped from the model. Perhaps homes located next to a park lose privacy and suffer from the noise that a park generates while homes located near the park get the benefits of the park without the negative consequences. This speculation is consistent with the positive value associated with green space. While green spaces afford the owner some of the benefits of a park, they do not create the extra foot traffic that a park generates and as such the model estimated they reduced time on market by 3.7 percent.

Subdivisions were found to increase home value by 4.1 percent and reduce time on market by 32.8 percent. This finding could be the result of homeowners, particularly those with young children, wanting to locate near other families, or perhaps homes in subdivisions benefit from having more traffic from potential buyers. Location on a cul-de-sac or corner did not have a significant impact on time on market. While a corner lot may not be desirable from a privacy standpoint, homes on corners tend to have larger lots which may explain the positive, but not statistically significant, impact on price. Hills which block use of the back yard did not significantly reduce price, but time on market was increased by 26.6 percent. This result is consistent with Haurin's finding that the owners of atypical homes will keep their homes on the market longer to find someone who values, or in this case does not mind, the addition of the attribute.

Roads and Man-Made Structures

As expected, roads generally reduced selling price and increased time on market with busier roads reducing price more than less traveled routes. Unlike previous research, this study examined whether roads located in the front or the rear of the home had differential impacts. One would expect that homeowners would prefer a road to be located in front of their home rather than behind because backyards are typically a place for activities where privacy is particularly important. The regression results confirm this suspicion and show that roads behind the home have a larger impact. For example, a high volume road in the front of the home increases time on market by 14.4 percent but the

same volume road located in the rear of the home increases time on market by 42.7 percent. Even low volume roads located in the rear of the home have a large impact on estimated time on market. Low volume roads in front increase time on market by only 4.6 percent but a low volume road in the back increases estimated time on market by 22.4 percent. Homes not located next to a major road but with a highway in view were not found to suffer a statistically significant reduction in home price.

As one would expect train tracks increased time on market by 72.9 percent but did not have a statistically significant impact on price. This outcome may be the result of an increasing home price market where owners of these homes benefited from a rising home market obscuring the impact on price of this feature. Major power lines behind the home had much less impact on home selling price than power lines in front, reducing price by only 4.2 percent compared to 8.6 percent. However, this result could occur because major power lines in the rear of the home generally have green space around them maintained by the power company providing additional space and privacy to the homeowner.

This research also found a significant impact of apartments in view of a home. The results indicate home prices are reduced by 9 percent if an apartment is in view and time on market increased by a staggering 38.8 percent —an amount only exceeded by train tracks, major power lines or high volume road in back of the home.

Home's Physical Characteristics

Physical attributes, while not the focus of this study, also play an important role in home selling price. Cathedral ceilings increased home price by 3.3 percent and reduced time on market by 9.7 percent. While this may suggest these ceilings are highly valued, it may also be highly correlated with one story homes which are more expensive to build and may be more likely to use cathedral ceilings, or in the case of two story homes; cathedral ceilings eliminate the use of the space above the first floor reducing the cost advantages of two story homes.

Finally, central air-conditioning had a large impact on selling price, increasing home price by 8 percent.. Home age was also found to be a significant factor reducing home price but having no impact on time on market. While the impact on home price for two story homes compared to one story homes was statistically insignificant, time on market for two story homes was found to be significantly longer than for one story homes, increasing time on market by 6.5 percent. The negative coefficient on price for the number of bathrooms might seem surprising at first since more bathrooms should be preferable to fewer bathrooms, but the regression analysis holds everything else constant so a home with the same square footage as another home but with one more bathroom will have less living space available in other rooms. What this indicates is that people prefer, on the margin, more space devoted to other rooms than to the addition of a bathroom.

CONCLUSIONS

The results in this paper provide estimates of how time on market is influenced by a variety of environmental attributes in a form which is easy to interpret. Given that the population of the Lehigh Valley is not atypical from other suburban communities, many of the results found in this paper should be applicable to other parts of the country, however, given the relatively high supply of certain environmental attributes such as homes with views, trees, and the availability of land for new homes, the value of these environmental attributes may be underestimated compared to communities with a paucity of these resources where buyers may vigorously compete for these scarce attributes

The results in this paper are useful not only to real estate agents trying to provide their clients with reasonable predictions for how long it will take to sell their homes, but also to a variety of other professions involved in real estate. Landscapers will find the reduced time on market provided by landscaping as an additional selling point to their product because not only can landscaping increase home price, it also reduces a home's time on market. Additionally, homeowners and real estate agents will find it useful to have estimates on how various attributes can reduce a home's time on market and increase selling price. Finally, builders deciding on which properties to build could use the information presented in this paper to make a more informed decision about potential sites not only in terms of home selling price but also how quickly the lots will likely sell.

REFERENCES

American Nursery & Landscape Association (ANLA) *Fact Sheet*

Allen, M. T., S. Faircloth and R. Rutherford. 2005. "The Impact of Range Pricing on Marketing Time and Transaction Price: A Better Mousetrap for the Existing Home Market?" *Journal of Real Estate Finance and Economics*, 31(1): 71-82.

Anglin, P. M., R. Rutherford and T. M. Springer. 2003. "The Trade-Off between the Selling Price of Residential Properties and Time-on-the-Market: The Impact of Price Setting, Journal of Real Estate Finance and Economics." 26(1): 95-111.

Bourassa, S. C., M. Hoesli and J. Sun. 2005. "The Price of Aesthetic Externalities." *Journal of Real Estate Literature*, 13(2): 167-87.

Des Rosiers, F., M. Theriault, Y. Kestens and P. Villeneuve. 2002. "Landscaping and House Values: An Empirical Investigation." *Journal of Real Estate Research*, 23(1-2): 139-61.

Des Rosiers, F. 2002. "Power Lines, Visual Encumbrance and House Values: A Microspatial Approach to Impact Measurement." *Journal of Real Estate Research*, 23(3): 275-301.

Geltner, D. M., B. D. Kluger and N. G. Miller. 1991. "Optimal Price and Selling Effort from the Perspectives of the Broker and Seller." *American Real Estate and Urban Economics Association Journal*, 19(1): 1-24.

Genesove, D. and C. Mayer. 2001. "Loss Aversion And Seller Behavior: Evidence From The Housing Market." *The Quarterly Journal of Economics*, 116(4): 1233-60.

Glower, M., D. R. Haurin and P. H. Hendershott. 1998. "Selling Time and Selling Price: The Influence of Seller Motivation." *Real Estate Economics*, 26(4): 719-40.

Haurin, R. 1988. "The Duration of Marketing Time of Residential Housing." *AREUEA Journal*, 16(4): 396-410.

Jud, G. D. and J. Frew. 1990. "Atypicality and the Natural Vacancy Rate Hypotheses." *AREUEA Journal*, 18(3): 294-301.

McElroy, J. P., W. Zhang, K. J. Koehler, S. J. Lamont and J. Dekkers. 2005. "Comparison Of Cox, Weibull, And Linear Regression Models To Detect Marker Associations With Survival Traits Using Full And Selective Genotyping." *Proceedings PAG XIII Conference*, San Diego, CA.

Miceli, T. J. 1989. " The Optimal Duration of Real Estate Listing Contracts." *AREUEA Journal*, 17(3): 267-77.

Munneke, H. J. and A. Yavas, Incentives and Performance in Real Estate Brokerage. 2001. *Journal of Real Estate Finance and Economics*, 22(1): 5-21

Ong, S. E. and Y. C. Koh. 2000. "Time On-market and Price Trade-offs in High-rise Housing Sub-markets." *Urban Studies*, 37(11): 2057-71.

Taylor, C. R. 1999. "Time-on-the-Market as a Sign of Quality" *Review of Economic Studies*, 66(3): 555-78.

U.S. Census. 2000. *Census of Population & Housing*, Summary File 3.

VISC (2008) Visual Information Systems Center, Lincoln Interactive Course and Student Analysis, online at http://visc.sis.pitt.edu

Appendix 1: Description of Variables

Variable	Description	Source of Data
Location and Time Variables:		
Allentown	Home is located in Allentown portion of Parkland School District	MLS data
Coplay	Home is located in Coplay township	MLS data
Corner	Homes is located at intersection of two roads	Inspection
Cul-de-sac	Home was located in the circular part of a Cul-de-sac	Inspection
In Subdivision	Home located within a subdivision	Inspection
Mid Vol. Month	Home sold during months of Jan, Feb, or Aug-Oct	MLS Data
Nbhood. on Slope	Neighborhood is located on slight hill	Inspection
North Whitehall	Home is located in North Whitehall township	MLS Data
Q2-Q26	Quarter in which home was sold	MLS Data
South Whitehall	Home is located in South Whitehall Township	MLS Data
Years Old	Age of home at time of sale	
Physical Characteristics:		
Aluminum	Home has aluminum siding only	MLS Data
Aluminum Brick/Stone	Home has brick or stone and aluminum siding	MLS Data
Asbestos	Home contains asbestos	MLS Data
Brick/Stone Stucco	Home has brick or stone and stucco siding	MLS Data
Brick/St.and other	Home has brick or stone and vinyl, aluminum, or wood siding	MLS Data
Brick/Stone Only	Home has brick and stone only	MLS Data
Central AC	Home has central air conditioning	MLS Data
Completely Finished	Entire basement area is finished	MLS Data
Daylight	Daylight basement.	MLS Data
Detached Garage	Home has detached garage	MLS Data
Fireplace Number	Number of fireplaces in home	MLS Data
Heat Pump	Home uses heat pump	MLS Data
Lot Size – Sq Ft	Size in square feet on lot	MLS Data
N. of Bathrooms	Number of bathrooms in home	MLS Data
Number of Cars	Number of cars that can be parked in garage	MLS Data
Partially Finished	Basement is partially finished	MLS Data
Radiator	Home uses radiator heat	MLS Data
Square Footage	Square footage of heated home not located in basement	MLS Data
Stories	Number of stories home possesses	MLS Data
Stucco and Vinyl	Home has stucco and vinyl siding	MLS Data
Stucco Only	Home has stucco siding	MLS Data
Trees		
Large Trees Back	Trees taller than 35 feet in rear of home	Inspection
Matr. Landscaping	Landscaping equivalent to estimated five years worth of growth.	Inspection
Tall Mature Trees	Trees over 15 feet tall but not more than 35 feet tall.	Inspection
Tree Line 1	Wall of trees located on the home's property line	Inspection
Tree Line 2	Tree line located on home's property line on two sides	Inspection
Tree Line 3	Trees line the property line on three sides	Inspection
Tree Lined Street	Street has shade trees on both sides	Inspection

Fall 2008

Variable	Description	Source of Data
Trees Overhang 1	Trees overhang home on one side	Inspection
Trees Overhang 2	Trees overhang home on two sides	Inspection
Trees Overhang 3	Tall trees overhang the home on three sides	Inspection
Trees Overhang 4	Trees overhang home on all four sides	Inspection
Wood 1	Woods are on one side of the property	Inspection
Wood 2	Woods are one two sides of the property	Inspection
Wood 3	Woods are located on 3 sides of the property	Inspection
Green Space		
Backs up to Field	Home has a field located in backyard	Inspection
Backs up to Home	Another home located within an estimated 100 feet of rear	Inspection
Detention Pond	Home backs up to pond designed to temporarily hold rain water	Inspection
Green Space	Mowed grass area located next to home	Inspection
Hill Obstructs Rear	Less than 15 feet of flat space in rear from downward sloping hill	Inspection
Park in Back	Rear of home backs up to park	Inspection
Park Near	Park located in two block walking distance w/o crossing busy road.	Inspection
Partial View	Views not visible from home's property but from neighborhood	Inspection
Private Home	Indicates home located out of view of any road	Inspection
Private Nghborhd.	Neighborhood with private drive and homes not visible from roads	Inspection
Protective Hill	Upward sloping hill located after at least 50 feet of flat lot	Inspection
Regular Pond	A natural pond is on property	Inspection
Secluded	Home is not near other homes or well-traveled areas	Inspection
Stream	Home has stream located on its property or line	Inspection
Man-Made Structures		
Business Buildings	Business buildings are in view	Inspection
Cell /Water Tower	Home has cell or water tower in view	Inspection
Industrial Area	Home is located within 1 block of light industrial area	Inspection
Maj. Power Back	Major transmission lines at home's rear	Inspection
Maj. Power Front	Major transmission line located on property front	Inspection
Min. Power Front	Home power transmission lines are not buried and located on front	Inspection
Min. Power Rear	Power lines to home above ground and visible in backyard of home	Inspection
Road Back High	Traffic on road behind home exceeds estimated 10 cars per minute	Inspection
Road Back Low	Traffic on road behind home is less than 2 cars per minute	Inspection
Road Back Mid	Traffic on road behind home is between 3 cars to 9 cars per minute	Inspection
Road Front High	Traffic on road in front of home exceeds 10 cars per minute	Inspection
Road Front Low	Traffic on road in front of home is less than 2 cars per minute	Inspection
Road Front Mid	Traffic on road in front of home is between 3 cars to 9 cars per minute	Inspection
Road Not Close	Road that is more than 100 feet from rear of home	Inspection
Shopping Center	Shopping center is visible from property	Inspection
Train Tracks	Home has train tracks within view	Inspection
Views:		
Apts. in View	Apartments can be seen from home's property	Inspection
Highway View	Home is within estimated 500 feet of highway	Inspection
Impressive View	Home has a greater than an estimated 3 mile view.	Inspection
Power Line View	Power lines are within 1000 feet of home but not on property	Inspection

Variable	Description	Source of Data
View	Home had a view estimated to be 2-3 miles	Inspection

Appendix 2: Descriptive Statistics

Attributes*	Proportion of Homes with Characteristic	Std. Deviation
Trees and Landscaping		
Tree Line: One Side	0.28	0.451
Two Sides	0.08	0.264
Three Sides	0.01	0.104
Trees Overhang: One	0.07	0.253
Two Sides	0.02	0.152
Three Sides	0.01	0.104
Four Sides	0.01	0.098
Tall Mature Trees	0.36	0.483
Large Trees Back	0.42	0.494
Mat. Landscaping	0.31	0.462
Views, Parks, Orientation, and Neighborhood		
Park Near	0.18	0.386
Green space	0.12	0.328
Partial View	0.35	0.478
View	0.23	0.418
Impressive View	0.16	0.368
In subdivision	0.85	0.361
Cul-de-sac	0.06	0.231
Corner	0.14	0.347
Hill Obstructs Rear	0.13	0.338
Roads and Man-Made Structures		
Road Front: High	0.05	0.210
Mid	0.05	0.227
Low	0.07	0.248
Road Back: High	0.03	0.168
Mid	0.02	0.137
Low	0.02	0.142
Power Back Major	0.01	0.112
Power Front Major	0.00	0.044
Highway View	0.09	0.280
Train Tracks	0.01	0.078
Apartments in View	0.05	0.218
Home's Physical Characteristics		
Central AC	0.81	0.391
Cathedral Ceilings	0.19	0.396
	Quantitative Attributes (Average)	
Number of Cars	1.75	0.985
Fireplace Number	0.70	0.616
Year Built	1978.64	28.294
Square Footage	2182.31	1237.27
Stories	1.77	0.616
Number Bathrooms	2.72	0.887
Heat Pump	0.32	0.465
Price	$222,685	$107,759
TOM	53.07	66.12