

A Comparative Assessment of New Urbanist Neighborhoods:  
Durham, NC & Greenville, SC

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## **ABSTRACT**

In recent years, the presence of traditional neighborhoods—or New Urbanist—real estate developments has grown substantially. The success of these developments hinges on the preferences of buyers in a market where conventional suburbs are the norm. While demand for New Urbanist developments seems high in the United States, a quantitative assessment of the value of these neighborhoods relative to conventional suburban developments remains incomplete. How much more (or less) are residents willing to pay in order to live in neighborhoods that display New Urbanist features? This paper attempts to determine the price premium that consumers are willing to pay by performing a hedonic price analysis on New Urbanist and conventional suburban residences located in two distinct cities: Durham, NC and Greenville, SC. Because these two cities provide such a unique variety of neighborhoods in a diverse set of locations, it may be possible to determine the value of New Urbanist design features, independent of location or proximity to a desirable downtown. The results indicate a significant price premium for New Urbanist homes, regardless of the development’s location.

## **INTRODUCTION**

Since the formalization of the New Urbanist Ideals by the Congress of New Urbanism in 1996, the manifestation of these design principles has been observed in various cities in the United States. New Urbanist developments—also called Traditional Neighborhood Developments (TND) or Smart Growth—hope to revive the traditional, village-like neighborhood structures in order to achieve sustainable growth while simultaneously improving quality of life. With these goals in mind, there are several key attributes that are essential for a Traditional Neighborhood Development\*:

- “Walkability”, or pedestrian friendliness
- Connectivity, grid street networks
- Mixed use housing and diversity
- Efficient use of land and increased density
- Traditional neighborhood structure

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\* From the “Ten Principles of New Urbanism” by TND Partners, LLC in Durham, NC.

Therefore, this study attempts to quantify home buyers' preferences towards neighborhoods that display these attributes. Two particularly useful cities for this purpose are Durham, NC and Greenville, SC.

While Durham and Greenville are two unique and distinct cities, parallels can be drawn between them. Both cities have been in the process of a significant and large scale downtown revitalization. In this respect, however, Greenville is ahead of Durham. The downtown area of Greenville has already become a commercial, cultural, retail, and local restaurant hub. With over 2 million square feet of Class A office space, over 79 restaurants, 130 retail stores, and the creation of the Peace Center for the Performing Arts, downtown Greenville has become a desirable home location for many residents. In a similar manner, Durham seeks this type of success in its own revitalization of its downtown district. According to the city of Durham ([downtowndurham.com](http://downtowndurham.com)), during the period of 2000 to 2007, downtown Durham has added over 1.5 million square feet in office space, over 5,300 employees and over 240 residential units (approximately 340 residents). It has experienced a redevelopment of old industrial buildings, new retail shops, restaurants, and the construction of a cultural center in the form of the Durham Performing Arts Center.

Accompanying the revitalizations of the downtowns of Greenville and Durham has been an increase in the presence of residential developments with New Urbanist attributes. The Trinity Heights development, located adjacent to Duke University and the local landmark, Ninth Street, represents the most obvious example of New Urbanist design in Durham. On the other hand, Greenville boasts a host of neighborhoods that are characterized by New Urbanist design in a variety of locations, both within the downtown region and isolated from it. Focusing on these neighborhoods, this study seeks to explore the value residents place on New Urbanist features.

In order to accurately quantify a price premium on New Urbanist type homes, we perform a hedonic price analysis comparing New Urbanist homes with those of conventional suburbs in each of the cities of Durham and Greenville. However, because of the previously described downtown location characteristics of each city, it is necessary to distinguish between effects on a home's value that are caused by a high demand location and those

caused by New Urbanist design features of the neighborhood. Therefore, this analysis attempts to compare the New Urbanist price premium in Durham—where Trinity Heights is the sole development observed with features of New Urbanism—and that of Greenville, where a variety of New Urbanist neighborhoods are analyzed in and around its downtown.

## **DATA**

### *Durham*

All real estate data and tax assessments for Durham homes were obtained from the Durham County Tax Administration Office. This information included 2008 records of all parcels in the city of Durham, home assessed values, area (in square feet), sale prices, and various other internal and external attributes of homes. Specific parcels were selected to establish a comparison of homes displaying New Urbanist design with homes of conventional suburbs. In Durham, the Trinity Heights development provides a neighborhood that displays New Urbanist attributes, while areas such as Hope Valley and the Croasdaile neighborhoods provide subdivisions of the conventional suburban design.

Houses of similar quality, values, and socioeconomic status of residents from each neighborhood were selected. In order to minimize variability, only single-family residences were observed, and neither town homes nor condos were included in this study.. Furthermore, any residences located on a golf course or country club property were dropped from the data in order to isolate only New Urbanist effects. Do and Krudnitski (1995) found a significant, 7.6%, price premium for a home located on a golf course. Additionally, homes located on golf courses tend to be more attractive in various aspects, including variables that are omitted from the regressions in this study. Including these data sets would lead to inaccurate estimates of the price premium in the regression. Therefore, parcels in the data located directly on the Croasdaile Country Club property, or the Hope Valley Country Club property were excluded. To further control for neighborhood design features, homes were selected in the same school district. Residences used for comparison are detailed below.

Trinity Heights, according to the Trinity Heights Neighborhood Association, has borders defined by the west side of Buchanan Boulevard, the east side of Broad Street, Markham

Avenue to the south, and Green Street to the north. In this six block neighborhood, assessed values for 40 single-family residences are specified. Summary statistics for these homes are shown in Table 1.1.

**Table 1.1:** Summary Statistics: Trinity Heights homes (40 observations)

<b>Variables</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>
Sale Price	\$287,725	\$89,816.90	\$127,500	\$490,500
Lot Size (acres)	.16505	.0212964	.119	.222
Area (sq. ft.)	1853.7	439.5332	816	2420
# Bathrooms	2.0975	.4209	1	3.5
# Bedrooms	3.35	.6622	2	5
Age (yrs)	23.075	31.6757	4	108
SAT score	996	0	996	996
Golf course (yes/no)	0	0	0	0

Conventional suburban homes used for comparison were selected from Croasdaile, and subdivisions in the vicinity north of Hope Valley. Both these areas are isolated from the CBD of Durham, and are characterized by conventional suburban neighborhood attributes. Croasdaile properties in the data include residences northwest of downtown Durham not located on the Croasdaile Country Club golf course. From Hope Valley, parcels were selected from Denada Path, Glidewell Courtt, Camberwell Court, Shrewsbury Street, Saxony Drive, Silverbush Court, Ashworth Drive, Meadowrun Drive, Sunningdale Way, Sun Valley Drive, and Woodberry Road. None of these parcels are located on the Hope Valley Country Club golf course. Summary statistics for the conventional suburban homes are shown in Table 1.2.

**Table 1.2:** Summary Statistics: Conventional developments, not in Trinity Heights (551 Observations)

Variable	Mean	Std. Dev.	Min.	Max.
Sale Price	\$323,145.70	\$193,041.50	\$104,500	\$1,800,000
Lot Size (acres)	.5050799	.2944982	.12	2
Area (sq. ft.)	2040.527	848.2147	632	6860
# Bathrooms	2.5515	.7553881	1	6.5
# Bedrooms	3.640653	.7043364	1	6
Age (yrs)	22.71143	15.8095	1	83
SAT score	1072.98	29.15235	996	1084
Golf course (yes/no)	.2196007	.41435	0	1

### *Greenville*

The real estate data for Greenville were not as complete and thorough as the Durham data set. The sources included the Greenville County Tax office and the online real estate source, Zillow.com. Because the majority of the New Urbanist neighborhoods in Greenville were newly developed, and so tax information regarding resale prices was limited, the tax assessed values were taken to be the observed market price, as was the case for Durham homes that had not recently sold (and hence been revalued). While internal characteristics such as the presence of a garage, fireplace, or basement are known to have an effect on the value of the house, the data sources did not have complete information on such attributes. Still, only single-family residences were considered, maintaining consistency in the data. However, while the Durham case did not allow for a selection of parcels with a wide variety of amenities, Greenville's more varied assortment of New Urbanist developments allowed for the inclusion of homes boasting amenities such as: proximity to a golf course, proximity to downtown, school district information, and proximity to a public park. All neighborhoods, both New Urbanist and suburban, are located within 18 miles of downtown Greenville.

Developments were considered New Urbanist on the basis of the aforementioned key attributes of Traditional Neighborhood Developments. The following neighborhoods were

selected, as they both displayed the design features of New Urbanism and advertised themselves as so: The Vineyards at North Main, the Village homes at Vermont, Boxwood, and Tuscan Woods. The Vineyards at North Main is the only one of these developments to have a downtown location—that is, the subdivision is within walking distance (<1 mile) from the center of the revitalized downtown. Summary statistics for the homes selected as New Urbanist are displayed in Table 1.3.

**Table 1.3:** Summary Statistics: New Urbanist Homes (61 Observations)

Variable	Units	Mean	Std. Dev.
Age	Years	3.245902	0.8690174
Value	Dollar	295750.8	47830.64
Lotsize	Square feet	6085.098	2138.573
Bedrooms	Number	3.278689	0.5811238
Bathrooms	Number	2.745902	0.5133465
Area	Square feet	2600.426	474.3722
Student Teacher Ratio	Percent	18.00656	1.127662
SAT score average	Score	1025.033	10.20125
Greenville CBD distance	Miles	8.267213	5.284938
Distance to airport	Miles	10.48197	3.52134
Tax rate	Percent	0.5934539	0.2395839
Distance to Shopping	Miles	6.540984	3.643825
Golf (yes/no)	Binary	0	0
Public Park (yes/no)	Binary	0.3934426	0.4925677
Downtown Location	Binary	0.2459016	0.4341942

A similar variety of homes were selected from the data when considering developments that are characterized by conventional suburban attributes. These subdivisions include: Tanner’s Mill, Bonnie Vista, Carson’s Pond, Deerfield, Spartan Place, and Botany Woods. Each development is in a distinct location: either accessible to downtown Greenville, or located several miles outside of the CBD. In particular, Botany Woods and Spartan Place are within walking distance to the center of downtown, while the remaining subdivisions are more outwardly located. It is worth noting that both the mean lot sizes and mean ages are substantially different between the New Urbanist homes and those from suburban

neighborhoods. The set of homes observed in conventional suburban neighborhoods tend to boast significantly larger lot sizes, while smaller and more consolidated lots encourage “walkability” and community in New Urbanist developments. Also, suburban homes are generally older, as all of the New Urbanist developments are relatively new projects. Summary statistics for these conventional suburban homes are shown in Table 1.4.

**Table 1.4:** Summary Statistics: Non-New Urbanist Homes (76 Observations)

Variable	Units	Mean	Std Dev
Age	Years	20.17105	14.03651
Value	Dollar	283764	92634.77
Lotsize	Square feet	19711.22	15842.94
Bedrooms	Number	3.723684	0.602189
Bathrooms	Number	2.677632	0.5459179
Area	Square feet	2710.092	620.2292
Student Teacher Ratio	Percent	17.58421	1.488718
SAT score average	Score	1019.487	43.5567
Greenville CBD distance	Miles	6.055263	4.308577
Distance to airport	Miles	11.84868	3.25603
Tax rate	Percent	0.5595109	0.2689226
Distance to Shopping	Miles	5.511842	3.228455
Golf (yes/no)	Binary	0.4868421	0.503148
Public Park (yes/no)	Binary	0.3684211	0.4855816
Downtown Location	Binary	0.5394737	0.5017513

## MODEL SPECIFICATION

For both cases of Durham and Greenville, similar hedonic pricing models are used to determine the value of New Urbanist design features. This hedonic pricing model is based on the model employed by Tu and Eppli (1999), in which they use both a linear and semi-log model to explain the variation in real estate prices, dependent on physical attributes, internal characteristics, and amenities of the home. Because Tu and Eppli (1999) find that estimation across various models including Box-Cox, semi-log, and linear forms, produce similar results, only the semi-log and linear models are performed in the Durham case. This model uses one binary variable (in our case either “TRINITYH” for Durham, or “NEWURBAN”



for Greenville) as a proxy for New Urbanist design features of the neighborhood. All other dependent variables serve as controls for those factors affecting home prices that are not associated with the New Urbanist effect. These variables would include data describing lot size, home attributes, internal characteristics, or total finished floor space.

Because of shortfalls in the data, however, it was infeasible to use the exact same variables and units in both models (data on internal home characteristics were incomplete). Therefore, the variables selected for Durham and Greenville reflect this difference. While in Durham, variables representing amenities such as golf course location and quality of school districts, were unnecessary due to careful selection of observations, the Greenville price analysis must include new variables to account for varying nearby school quality, proximity to amenities (golf course and country club, shopping, public parks), or being located in downtown Greenville. Table 2.1 displays a complete list of variables for the Durham data, while Table 2.2 illustrates the variables selected for the Greenville case.

**Table 2.1:** Dependent and Independent Variables in the Durham Hedonic Pricing Model

Variable	Description
Dependent Variables	
ASSESSEDVALUE	Assessed values recorded by Durham County Tax Assessment Office
LOGVALUE	Natural logarithm of the assessed value recorded on the deed
Independent Variables	
LOTSIZE	Acreage of lot
AGE	Age of the house (yrs)
AGESQUARE*	Square of the age variable.
NEW	Binary variable = 1 if age of house is one year or less; 0 otherwise
AREA	Total finished area (sq. ft.)
GARAGE	Binary variable. If garage is present, GARAGE=1; GARAGE=0 otherwise
FIREPLACE	Binary variable. If fireplace is present, FIREPLACE = 1; FIREPLACE=0 otherwise.
BASEMENT	Binary variable. If basement is present, BASEMENT=1; BASEMENT=0 otherwise.
BEDROOMS	Number of bedrooms
BATHROOMS	Number of bathrooms (1/2 bathroom = only sink and toilet)
TRINITYH	Binary variable: if house is located in Trinity Heights, TRINITYH=1. Otherwise, TRINITYH=0. This variable captures the distinguishing New Urbanist attributes.

\* AGESQUARE is included because Tu and Eppli (1999) assert that a quadratic form of age may best describe the physical depreciation rate. good

Linear Model for Durham:

$$\text{Assessed Value} = \beta_0 + \beta_1 \text{lotsize} + \beta_2 \text{age} + \beta_3 \text{age}^2 + \beta_4 \text{New} + \beta_5 \text{Area} + \beta_6 \text{Garage} + \beta_7 \text{Fireplace} + \beta_8 \text{Basement} + \beta_9 \text{Bedrooms} + \beta_{10} \text{Bathrooms} + \beta_{11} \text{TrinityH} + \varepsilon_i$$

Semi-log Model for Durham:

$$\text{Log(Value)} = \beta_0 + \beta_1 \text{lotsize} + \beta_2 \text{age} + \beta_3 \text{age}^2 + \beta_4 \text{New} + \beta_5 \text{Log(Area)}^* + \beta_6 \text{Garage} + \beta_7 \text{Fireplace} + \beta_8 \text{Basement} + \beta_9 \text{Bedrooms} + \beta_{10} \text{Bathrooms} + \beta_{11} \text{TrinityH} + \varepsilon_i$$

In this case, the variable “TRINITYH” acts as a proxy for New Urbanist design features. The null hypothesis is that “TRINITYH”=0, which would imply that people do not value New Urbanist over other characteristics, and they would pay similar prices for comparable homes inside and outside. If the null is rejected, and a significant and substantial parameter estimate for “TRINITYH” is found, then this implies a price premium for home prices in Trinity Heights.

Linear Model for Greenville:

$$\text{Assessed Value} = \beta_0 + \beta_1 \text{lotsize} + \beta_2 \text{age} + \beta_3 \text{age}^2 + \beta_4 \text{area} + \beta_5 \text{downtown} + \beta_6 \text{SATscore} + \beta_7 \text{StudentTeach} + \beta_8 \text{Taxrt} + \beta_9 \text{Bedrooms} + \beta_{10} \text{Bathrooms} + \beta_{11} \text{greencbd} + \beta_{12} \text{shopping} + \beta_{13} \text{airport} + \beta_{14} \text{golf} + \beta_{15} \text{parksrecreation} + \beta_{16} \text{NewUrban} + \varepsilon_i$$

Semi-log Model for Greenville:

$$\text{Log(Value)} = \beta_0 + \beta_1 \text{lotsize} + \beta_2 \text{age} + \beta_3 \text{age}^2 + \beta_4 \text{Log(area)} + \beta_5 \text{downtown} + \beta_6 \text{SATscore} + \beta_7 \text{StudentTeach} + \beta_8 \text{Taxrt} + \beta_9 \text{Bedrooms} + \beta_{10} \text{Bathrooms} + \beta_{11} \text{greencbd} + \beta_{12} \text{shopping} + \beta_{13} \text{airport} + \beta_{14} \text{golf} + \beta_{15} \text{parksrecreation} + \beta_{16} \text{NewUrban} + \varepsilon_i$$

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\* In the semi-log model, Log(AREA) is included because the data measure area in square footage, which creates large numbers in the thousands, whereas most other variables are binary. So taking the natural logarithm of area reduces problems of heteroskedasticity.

**Table 2.2:** Dependent and Independent Variables in Greenville Hedonic Pricing Model

Variable	Description
<b>Dependent Variables</b>	
ASSESSED VALUE	Assessed value (in dollars) of the home, as recorded by the Greenville tax assessor
LOGVALUE	Natural logarithm of the assessed value recorded on the deed
<b>Independent Variables</b>	
LOTSIZE	Lot area in square feet
AGE	Age of house (yrs)
AGESQUARE	Square of the age variable.
AREA	Total finished area (sq. ft.)
BEDROOMS	Number of bedrooms
BATHROOMS	Number of bathrooms (1/2 bathroom: no shower)
DOWNTOWN	Binary Variable. If property is pedestrian accessible (<1.5 miles) to downtown, DOWNTOWN=1. Otherwise, DOWNTOWN=0
SATSCORE*	Average 2007 SAT score of nearest high school to properties
STUDENTTEACH	The student/teacher ratio of nearest high school to properties
TAXRT	Tax rate based on 2007 owed tax
GREENCBD	Distance (in miles) to downtown Greenville (defined as intersection of S Main St and Washington St)
SHOPPING	Distance (in miles) to Haywood Mall/Haywood Rd shopping area
AIRPORT	Distance (in miles) to Greenville-Spartanburg International Airport
GOLF	Binary variable: if subdivision is within walking distance (<1 mile) from a golf course and country club, GOLF = 1. Otherwise, GOLF = 0.
PARKSRECREATION	Binary variable: if subdivision is within walking distance (<0.5 miles) of a public park
NEWURBAN	Binary variable: if subdivision features New Urbanist characteristics, NEWURBAN=1. otherwise, NEWURBAN = 0.

*New Variables:*

A significant variable to note is the “DOWNTOWN” variable which describes the value of a home that has a downtown location. This would entail that the property be in walking distance (less than 1.5 miles) of the revitalized downtown district of Greenville. This variable aims to capture the value residents place on being in a downtown location versus one outside of the CBD. The variables “SHOPPING”, “AIRPORT”, “GOLF”, “PARKSRECREATION”, and “SATSCORE” describe possible amenities and public service items that may influence the value consumers put on a property. The Haywood Mall shopping district, located on Haywood Road is used as the commercial amenity for

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\* SAT score data obtained from South Carolina department of education data, 2007 SAT report: [ed.sc.gov/topics/assessment/scores/sat/2007/index.html](http://ed.sc.gov/topics/assessment/scores/sat/2007/index.html)

surrounding neighborhoods. It is also worth noting that the airport variable describes the distance to Greenville-Spartanburg International airport, the only commercial airline airport in Greenville.

In this hedonic pricing model for Greenville, the variable “NEWURBAN” acts in the same manner that “TRINITYH” did in the Durham analysis. The null hypothesis states that “NEWURBAN”=0, which implies that neighborhoods considered New Urbanist in Greenville have no price premium on their homes, and we could not conclude consumers prefer these Traditional Neighborhood design features.

## **RESULTS**

### *Durham Results*

Across both versions of the model for the Durham, NC case, the variable representing New Urbanist design features is significant and large. Therefore, we can reject the null hypothesis and confirm that there exists a New Urbanist price premium. Additionally, all independent variables have the expected sign and are significant. In both the linear and semi-log model results (Tables 3.1 & 3.2 respectively), the parameter estimate for TRINITYH indicates a price premium for homes in Trinity Heights. The linear model implies that, compared to a conventional suburban home, a home that is located in Trinity Heights would have an \$88,485.99 price premium. Furthermore, in the semi-log model, the parameter estimate indicates that Trinity Heights homes would have a 36.7% price premium.

**Table 3.1:** Durham explanation of ASSESSEDVALUE using linear form

Linear Model

Variables	Coef.	Robust Std. Err.	T	P>t
<b>ASSESSEDVALUE</b>				
Intercept	59056.46	17251.97	3.42	0.001
LOTSIZE	109267.1	15970.27	6.84	0
AGE	-1596.928	475.8124	-3.36	0.001
AGESQUARE	4.56244	5.644592	0.81	0.419
NEW	34894.42	14200.72	2.46	0.014
AREA	20.43569	4.255655	4.8	0
GARAGE	24299.03	8252.357	2.94	0.003
FIREPLACE	18558.76	9220.072	2.01	0.045
BASEMENT	12233.77	8878.033	1.38	0.169
BEDROOMS	18402.29	4134.383	4.45	0
BATHROOMS	19907.62	4746.792	4.19	0
TRINITYH	<b>88485.99</b>	14181.12	6.24	0

Observations = 470  
R-squared = 0.4684

**Table 3.2:** Durham explanation of LOGVALUE using semi-log form

Semi-log Model

	Coef.	Robust Std. Err.	T	P>t
<b>LOGVALUE</b>				
_cons	10.64816	0.2131049	49.97	0
LOTSIZE	0.487361	0.0661037	7.37	0
AGE	-0.0078747	0.0020481	-3.84	0
AGESQUARE	0.0000308	0.000025	1.23	0.218
NEW	0.122357	0.0488112	2.51	0.013
LOGAREA	0.1466991	0.0277265	5.29	0
GARAGE	0.1333375	0.0362675	3.68	0
FIREPLACE	0.0987831	0.0384905	2.57	0.011
BASEMENT	0.0728799	0.0363087	2.01	0.045
BEDROOMS	0.0754341	0.0166126	4.54	0
BATHROOMS	0.070357	0.0181036	3.89	0
TRINITYH	<b>0.3670272</b>	0.0524279	7	0

Observations = 470  
R-squared = 0.5060

*Challenges in the Model*

When compared to the results obtained by Tu and Eppli (1999), the 36.7% price premium implied by the Trinity Heights model is unusually large. Tu and Eppli (1999) find a 12% or \$25,000 price premium for the Kentlands New Urbanist neighborhood in their analysis. While the large parameter estimate for Trinity Heights indicates that these homes are undeniably more valuable than comparable homes in suburban neighborhoods, this price premium still seems inflated. These unusual results bring attention to potential issues with the original hedonic model used in Durham. Several problems of collinearity and omitted variable bias are introduced into the model as a result of the location characteristics of Trinity Heights and other unobservable omitted variables.

More specifically, Trinity Heights' location is perfectly collinear with the neighborhood's proximity to notable amenities in Durham. Within walking distance of the Trinity Heights development is Duke University's East Campus, a location that would be particularly valued by employees of the university. Also, Trinity Heights boasts a convenient proximity to Ninth Street, a popular commercial area with shopping and local restaurants. Proximity to these desirable amenities would result in higher real estate values for Trinity Heights properties. In this study, however, the comparison neighborhoods of Croasdaile and Hope Valley are neither New Urbanist nor close to Duke University and Ninth Street. This gives rise to perfect collinearity issues when attempting to analyze the capitalization of such neighborhood attributes in real estate values. Consequently, specific location effects of Trinity Heights inflate the New Urbanist price premium. Hence, other unquantifiable attributes of the Trinity Heights properties may introduce omitted variable bias.

Because Trinity Heights is the only prominent development with New Urbanist design features in Durham, it faces no competition with similar housing types. Thus, this contributes to higher rents for these properties, driving the measured price premium up. Another factor that produces similar effects is the favorable general perception of Trinity Heights. With the support of Duke University, Trinity Heights has become an attractive locale for many Duke employees and faculty, helping to create a reputation of amicable neighbors and a welcoming environment. While this would likely increase the price premium, it is difficult to quantify this effect. As a result, the New Urbanist proxy may be,

to some degree, biased, and its large coefficient may reflect both the absence of competitive alternatives and Duke University policies intended to bolster Trinity Park.

Greenville, SC provides a possible solution to these issues in this hedonic price model. Because multiple New Urbanist neighborhoods can be identified in various locations in Greenville, more explanatory variables can be included in the model. With both conventional suburban and New Urbanist developments located near local amenities (local shops, restaurants, downtown, etc.) and other factors that would contribute to home values, collinearity and omitted variables are minimized. In this new analysis, the variable proxy representing the New Urbanist features is named “NEWURBAN,” encompassing the price premium Greenville consumers in the housing market are willing to pay for New Urbanist features.

#### *Greenville Results*

In the modified hedonic model, including the new Greenville-specific variables, results show a more realistic and feasible price premium. Tables 3.3 and 3.4 indicate that the parameter estimate for the New Urbanist proxy (“NEWURBAN”) is significant and large across both the linear and semi-log models. The linear model implies a \$28,273 price premium for Greenville real estate boasting New Urbanist features, while the semi-log model shows 13.7% price premium. These estimates are significantly lower than parallel estimates for Trinity Heights in Durham.

All other independent variables have the expected signs with the exception of “BEDROOMS”, “SHOPPING”, and “PARKSRECREATION”. It would be expected that as the number of bedrooms increases in a home, the price should accordingly increase. However, the coefficient on the variable describing the number of bedrooms is negative. Similarly, it seems logical that distance to the nearest shopping center, namely Haywood Mall, would be positively related to home prices. The same would be true for a public park, unless the park is undesirable and not well-maintained. Nevertheless, these variables, along with “TAXRT” are not significant on the 5% level. Therefore, subsequent regressions (shown in the appendix) exclude the insignificant variables. As shown in Tables 4.1 and 4.2

(appendix), the exclusion of these independent variables does not substantially lower the explanatory power of the model.

**Table 3.3:** Greenville Explanation of VALUE using linear form.

Linear Model

Variable	Coef.	Robust Std. Err.	t	P>t
<b>VALUE</b>				
Intercept	-1203110	301517.2	-3.99	0
LOTSIZE	1.196272	0.2489573	4.81	0
AGE	-3965.317	1292.974	-3.07	0.003
AGESQUARE	32.47319	27.96282	1.16	0.248
AREA	77.70805	6.482247	11.99	0
BEDROOMS	-184.1261	3484.777	-0.05	0.958
BATHROOMS	17379.05	4153.774	4.18	0
DOWNTOWN	68981.58	19276.04	3.58	0
SATSCORE	914.0916	203.9536	4.48	0
STUDENTTEACH	15297.39	6708.156	2.28	0.024
TAXRT	-2001.377	5327.076	-0.38	0.708
GREENCBD	4122.327	1620.273	2.54	0.012
SHOPPING	-1477.553	3759.481	-0.39	0.695
AIRPORT	-1931.858	2282.034	-0.85	0.399
GOLF	85797.32	8845.547	9.7	0
PARKSRECREATION	-14604.67	8940.59	-1.63	0.105
<b>NEWURBAN</b>	<b>28273.06</b>	8683.475	3.26	0.001

Observations = 137  
R-squared = 0.9428



**Table 3.4:** Greenville explanation of LOGVALUE using semi-log form.

Semi-log Model

Variable	Coef.	Robust Std. Err.	t	P>t
LOGVALUE				
Intercept	1.296665	1.207931	1.07	0.285
LOGLOTSIZE	0.0788181	0.02329	3.38	0.001
AGE	-0.0128997	0.0050692	-2.54	0.012
AGESQUARE	0.0000947	0.0001066	0.89	0.376
LOGAREA	0.6839383	0.0546281	12.52	0
BEDROOMS	0.0109929	0.0113651	0.97	0.335
BATHROOMS	0.0438194	0.014855	2.95	0.004
DOWNTOWN	0.3435633	0.0727543	4.72	0
SATSCORE	0.003463	0.0008052	4.3	0
STUDENTTEACH	0.0806165	0.0260512	3.09	0.002
TAXRT	-0.0199874	0.0241916	-0.83	0.41
GREENCBD	0.0061076	0.0057842	1.06	0.293
SHOPPING	0.0167978	0.0145364	1.16	0.25
AIRPORT	-0.0226855	0.0076747	-2.96	0.004
GOLF	0.2810339	0.0383759	7.32	0
PARKSRECREATION	-0.0282633	0.0322288	-0.88	0.382
NEWURBAN	<b>0.1372514</b>	0.0366253	3.75	0

Observations = 137  
R-squared = 0.9298

## CONCLUSIONS

Considering the results in both Durham and Greenville, we can firmly conclude that neighborhoods possessing features of New Urbanism carry a higher value than comparable conventional developments. However, determining the exact magnitude of the price premium residents are willing to pay, a comparison of a variety of neighborhoods in varied contexts is required. In Durham, results indicate an \$88,486 or 36.7% price premium for Trinity Heights homes. But when this price premium is considered in light of the Greenville results, which consisted of a \$28,273 or 13.7% New Urbanism price premium, weaknesses in the Durham analysis are exposed. Issues of perfect collinearity and omitted variable bias—due to Trinity Heights’ unique and desirable location characteristics—in the hedonic price model may have exaggerated the Trinity Heights price premium.

The Greenville numbers provide a smaller, more reliable complement to the Durham price premium. It follows from such a large scale and successful revitalization of its commercial, cultural, and entertainment center, that a downtown location would also incur a price premium for real estate. Therefore, this effect must be controlled for. Due to the multitude of New Urbanist neighborhoods available, it is possible to disaggregate the price effects of other location amenities, namely a proximity to a desirable and revitalized downtown.

From the parameter estimates for the New Urbanist proxy obtained, it seems most plausible that a home located in a New Urbanist development has a price premium of approximately 13.7% or \$28,273. Therefore, residents in general will be willing to pay a significant price premium for a neighborhood that boasts pedestrian friendliness, efficient land-uses, common places for social events, grid street networks, and an overall more traditional neighborhood structure. Further research should assess these attributes in order to determine which characteristics of New Urbanism are more desired. By performing a more specific and disaggregate assessment, a more specific explanation of how New Urbanism is capitalized in home prices may be obtained.

## APPENDIX

**Table 4.1:** Greenville explanation of VALUE using linear form.

Linear Model (dropped insignificant variables)

Variable	Coef.	Robust Std. Err.	t	P>t
<b>VALUE</b>				
Intercept	-1499663	131042.6	-11.44	0
LOTSIZE	1.332467	0.2418298	5.51	0
AGE	-3704.804	1131.326	-3.27	0.001
AGESQUARE	31.7033	26.24832	1.21	0.229
AREA	77.27731	5.454433	14.17	0
BEDROOMS	-2358.343	3314.413	-0.71	0.478
BATHROOMS	20377.21	3864.958	5.27	0
DOWNTOWN	35616.05	9587.193	3.71	0
SATSCORE	1076.81	110.7561	9.72	0
STUDENTTEACH	21993.25	2167.117	10.15	0
TAXRT	~	~	~	~
GREENCBD	1613.357	783.3003	2.06	0.042
SHOPPING	~	~	~	~
AIRPORT	~	~	~	~
GOLF	90600.32	9628.814	9.41	0
PARKSRECREATION	~	~	~	~
NEWURBAN	<b>27913.16</b>	7191.471	3.88	0

Observations = 137  
R-squared = 0.9389

**Table 4.2:** Greenville explanation of LOGVALUE using semi-log form.

Semi-log Model (dropped insignificant variables)

Variable	Coef.	Robust Std. Err.	t	P>t
<b>LOGVALUE</b>				
Intercept	1.049744	0.3918399	2.68	0.008
LOGLOTSIZE	0.0919412	0.0191096	4.81	0
AGE	-0.0122378	0.0046968	-2.61	0.01
AGESQUARE	0.0001093	0.0001059	1.03	0.304
LOGAREA	0.7099302	0.0480021	14.79	0
BEDROOMS	0.0054411	0.0106794	0.51	0.611
BATHROOMS	0.050125	0.0134588	3.72	0
DOWNTOWN	0.1605884	0.0388861	4.13	0
SATSCORE	0.0034283	0.0003629	9.45	0
STUDENTTEACH	0.0716196	0.0094823	7.55	0
TAXRT	~	~	~	~
GREENCBD	0.0060568	0.0033217	1.82	0.071
SHOPPING	~	~	~	~
AIRPORT	~	~	~	~
GOLF	0.2648318	0.0347519	7.62	0
PARKSRECREATION	~	~	~	~

NEWURBAN	<b>0.1573231</b>	0.0314011	5.01	0
Observations =137				
R-squared = 0.9228				

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### REFERENCES

- Congress for the New Urbanism. 1996. *Charter of the New Urbanism*. Congress for the New Urbanism IV: Charleston SC.
- Dickinson, A. New Urbanism in the Durham Context” *Traditional Neighborhood Development Partners*. Powerpoint. 2005. 10 September 2008. <<http://courses.duke.edu/>>
- Durham County Government, Tax Administration Office.
- Do, A.Q. & Grudnitski, G. (1995). Golf Courses and Residential House Prices: An Empirical Examination. *Journal of Real Estate Finance and Economics*. **10**(3). 261-270.
- SAT Performance by Students in North Carolina’s Public School System and Schools, 2006-2008. *Public Schools of North Carolina*. <<http://www.ncpublicschools.org/docs/newsroom/news/2008-09/0826/sat-performance.pdf>>
- Song, Y. & Gerrit-Jan, K. (2003). New urbanism and housing values: a disaggregate assessment. *Journal of Urban Economics*. **54**. 218-238.
- South Carolina Department of Education. *2007 SAT report*. <[ed.sc.gov/topics/assessment/scores/sat/2007/index.html](http://ed.sc.gov/topics/assessment/scores/sat/2007/index.html)> Accessed Dec. 8 2008.
- Spatial Data Explorer/GoMaps. *Durham County NC Public Access*. 1 November 2008. <<http://gisweb.durhamnc.gov/gomaps/map/index.cfm>>
- Tu, C. C. & Eppli M. J. (1999). Valuing New Urbanism: The Case of Kentlands. *Real Estate Economics*. **27**(3). 425-451.