Economic Consequences of Land-Use Regulations on Jobs, Families, Communities, and Housing Affordability in Mecklenburg County

A 2011-2012 STUDY

Piedmont Public Policy Institute

Johnson C. Smith University
Charlotte's Premier Independent Urban University

Commissioned by

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Foreword

The availability of housing that is within reach of all citizens is a critical indicator of the economic health of any metropolitan region. An ample supply contributes to a jobs-housing balance that reduces traffic congestion, promotes socially integrated communities, and helps employers keep their labor costs in check. A deficit in core employment areas, on the other hand, results in higher commuting and public infrastructure costs, along with increased neighborhood segregation, as middle- and working-class families are forced out of the center city to areas where they can find housing within their budget.

Housing costs are impacted by a variety of factors, including the supply of buildable land, the price of labor and materials, and the cost of capital. But government regulation also plays a significant role, and, as the following study shows, can increase the cost of housing by as much as a factor of four times the cost of compliance. Moreover, unlike land, labor and material costs, the cost of regulation is directly controllable, and its impact on housing affordability can be quantified, evaluated, and balanced with the benefits of each regulation.

The purpose of this analysis is not to question the need for regulation. Clearly, some level of regulation is necessary for the protection of public health and safety, whether through building codes that ensure the structural integrity of a home or through storm water regulations that prevent flooding of adjoining communities and siltation of nearby drinking water sources.

Much regulation, however, exceeds this purpose and seeks either to meet some subjective, intangible aesthetic or to unfairly burden new housing with costs that should be borne by the community at large. Before imposing regulation that could add thousands to the cost of a home, policymakers should conduct a thorough cost-benefit analysis to determine whether the stated objective is justified by the additional burden created.

Even if regulation fulfills a legitimate public purpose, its impact on housing affordability should be quantified and discussed, so that policymakers and elected officials can seek ways to more equitably assign the costs to all who benefit in the community. By subjecting each proposed development policy to a rigorous cost-benefit analysis, such as the ones outlined in the following report, local governments can ensure they are

achieving an appropriate balance between the need for regulation and the provision of an adequate supply of affordable housing for their population.

The highly regressive nature of regulatory costs means their impact weighs most heavily on buyers and renters at the lower end of the income scale, disproportionately constraining access to housing for this group. The result is often that poor and working-class families are either forced into lower-quality housing or driven further from core employment centers to the periphery of a metropolitan area, producing communities that are more highly segregated by income, along with increased traffic congestion and commute times for all.

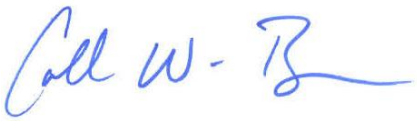
Few policymakers need to be convinced of the critical role housing affordability plays in their community. Cities that succeed in creating and maintaining a vibrant quality of life for their residents naturally attract others to live there. The resulting population growth provides the tax revenue that allows the city to continue improving on the infrastructure, services and amenities that further enhance its appeal — but it also creates pressure on land prices that eventually puts housing out of reach for all but the most affluent. In response, elected officials often turn to initiatives like subsidy programs and inclusionary housing mandates to fight the trend of social segregation and the flight of its workforce to surrounding communities where the cost of living is still within reach.

Yet while many elected officials lament the need for greater levels of housing affordability in their cities, they are unaware that the unintended consequences of their own regulatory policies are exacerbating the problem. They approve costly mandates for architectural design, surety bonding, storm water controls and the provision of open space that, while seemingly beneficial to the broader community, add dramatically to the cost of each new single-family home and multifamily unit that is constructed.

As the following report shows, there is an indisputable correlation between land-use regulation and housing cost. Increases in regulation in a given area produce a decrease in supply, and consequently an increase in the price of housing. When combined with increases in both the cost of land and the cost of labor and materials, the impact of regulation can easily price large segments of the population out of housing, particularly in desirable neighborhoods close to jobs, shopping and high-quality schools.

By evaluating three specific local land-use regulations in Mecklenburg County, this study intends to provide a framework through which policymakers can conduct a meaningful analysis of each proposed rule prior to its adoption to determine whether its policy objective justifies the additional cost it imposes on housing. It is only when regulation is viewed through this prism that communities will begin to elevate housing affordability to the same level of priority at which other critical issues are addressed.

The Board of the Piedmont Public Policy Institute is grateful to Sherrill Hampton and the research team at Johnson C. Smith University for undertaking this important study. We hope it will help to shed new light on the need to carefully evaluate local land-use regulation in the context of its impact of housing affordability and community growth.



Collin Brown
Chairman
Piedmont Public Policy Institute

Acknowledgment

The Principal Investigators wish to thank the Board of Directors of the Piedmont Public Policy Institute (PPPI). A special thank you is extended to PPPI's Chairman, Mr. Collin Brown and Mr. Joe Padilla, Executive Director, as well as the former Executive Director, Mr. Don Harrow.

Piedmont Public Policy Institute (PPPI) commissioned this study in 2011. The Institute is a 501(c)(3) organization established to provide independent research, analytical capabilities, and education relating to economic development, the real estate and building industry, transportation, the environment, and related matters. The initial focus of the Institute is issues relevant to the Charlotte region, including both North and South Carolina.

The views expressed in this study are those of the authors and are not necessarily those of the Board of Trustees, Officers, President, staff or other faculty members of Johnson C. Smith University.

Executive Summary (Parts I and II)

Curtailing new residential developments … makes little sense. It is the equivalent of creating jobs in a city but then denying those jobs to any applicant who comes from somewhere else. Moreover, it is likely to accelerate the displacement of poor residents, not slow it down. [1]

This study is two-fold. Part I was conducted by Dr. G. Donald Jud of Jud & Associates and explores the economic impact of housing development in Mecklenburg County, North Carolina. The economic data utilized in Part I covers the period 2010-2012. In Part II, the research centers around the impact of land-use regulations on housing affordability and what that means for low income individuals and families, as well as the long-term vitality of the Charlotte/Mecklenburg area. This portion of the study was conducted by Dr. N.V. Desai and Dr. Linette Fox, faculty members at Johnson C. Smith University, as well as former University staff member, Sherrill Hampton, J.D.

Mecklenburg County is situated in southwestern North Carolina and is the largest of the state's 100 counties with a 2010 population of 919,628, or 9.6% of the state total. The county is dominated by Charlotte, the state's largest city with a 2010 population of 711,349.

Economic activity and employment in the county suffered with the onset of the recent recession. From the start of the recession in December 2007, the county has lost some 71,000 jobs, a decline of 8.2%. The unemployment rate went from 5% in December 2007 to 10.7% in November 2011. Since the end of the recession in June 2009, county employment has continued to decline, sliding 0.9%. The area housing market also has suffered with the overall economy since the start of the recession. Area housing prices peaked in August 2007. Since then they have declined 16.1%, through October 2011. In comparison, housing prices nationally were down 28.3%.

The economic impact analysis of housing presented here is conducted using the IMPLAN® (IMpact Analysis for PLANing) input-output model that divides the economy into sectors, defined by the good or service produced, where the outputs of one sector are inputs of another.

Development of a new single-family, owner-occupied structure is estimated to generate an average of $111,708 per year in additional output (or business revenues) in the county from the initiation of construction through the first 10 years of occupancy. The present value of the additional output is $1,030,844. The average employment gain is 0.87 net new jobs, with an average wage of $43,146. The new development is estimated to generate an additional $9,070 in local tax revenues annually through the first

[1] Enrico Moretti, *The New Geography of Jobs* (Boston: Houghton Mifflin Harcourt, 2012), p. 410.

10 years of operation. The present value of the additional tax revenue is $79,117.

Development of a new multi-family, owner-occupied housing unit is estimated to generate an average of $88,749 per year in additional business revenues in the county from the initiation of construction through the first 10 years of occupancy. The present value of the additional output is $817,648. The average employment gain is 0.68 net new jobs, with an average wage of $43,798. The new development is estimated to generate an additional $7,075 in local tax revenues annually through the first 10 years of operation. The present value of the additional tax revenue is $61,710

Development of a new multi-family, renter-occupied housing unit is estimated to generate an average of $72,030 per year in additional business revenue in the county from the initiation of construction through the first 10 years of occupancy. The present value of the additional output is $649,040. The average employment gain is 0.59 net new jobs, with an average wage of $41,299. The new development is estimated to generate an additional $4,644 in local tax revenues annually through the first 10 years of operation.

In total, residential development (single- and multi-family) in 2010 stimulated a stream of new business revenues estimated at $184,415,131 annually. It created 1,458 new jobs and $13,122,871 in extra tax revenues each year for local governments. The estimated present value of the additional business revenues in 2010 is $1.5 billion and the present value of the added tax revenues is $115 million.

In evaluating the economic impact of the housing industry, it should be noted that the economic impact estimates presented here are drastically reduced because of the recession that has devastated the building industry since 2007. If building activity were again to reach the 2004 level, the estimated economic impact would increase by a factor of four.

Fiscal impact analysis seeks to show the effects of new development on local government budgets. Single-family, owner-occupied development is estimated to produce an annual fiscal surplus of $485 per capita, or a total of $1,281 annually for each unit. Multi-family, owner-occupied development shows an annual fiscal surplus of $2,119 per capita, or $3,217 annually per unit. Multi-family, renter-occupied development shows a very modest annual fiscal surplus of $32 per capita, or $56 annually per unit. The small net fiscal surplus produced by apartment development is not surprising given that the average income of apartment households is below the average income of all county households, and the average cost of a new apartment is less than the average value of a new owner-occupied home, resulting in lower property tax revenues compared to owner-occupied single-family housing.

As you will note from the preceding discussion, new real estate development in Charlotte/Mecklenburg has an extremely positive impact on

the economic vitality of the area. This is not a new hypothesis and will continue to be discussed in light of the resurgence of the housing industry. As the market rebounds, the positive economic impact will continue to grow. However, municipalities around the world will also continually confront the question of growth management and control, as they seek to become more sustainable and enhance their environmental stewardship. So, what does the enactment of these growth controls mean to the housing industry and more importantly, what does it mean to affordability in Charlotte/Mecklenburg.

In Part II, the Principal Investigators utilize a variety of indices to determine the impact of land-use regulations on jobs, families, communities, and housing affordability in Charlotte/Mecklenburg. The cost of housing does increase with increases in regulation. However, this very simple assertion has nuisances with noteworthy implications, as discussed.

The results from Jud's (2011) IMPLAN analysis provide compelling evidence for a strong potential economic impact of real estate development of new affordable housing on the Charlotte/Mecklenburg economy through job creation and increased tax revenues. Further, the results from the indices [Demographia (2010), National Association of Home Builders (NAHB)/Wells Fargo Housing Market Index model and the 80/20 Rule] used to determine the affordability impact of regulations on economic growth in Charlotte/Mecklenburg indicate that housing is affordable in the area. However, these results can be misleading when analyzing the impact of the recession on the unemployment rate, the level of household income needed for securing quality housing, and the increasing numbers of homeless individuals and families. Additionally, these results raise two important issues that must be considered in any analysis of housing affordability: (a) land-use regulations raise the price of housing, and (b) housing affordability declines during recessionary periods of high unemployment rates and decreased job creation.

Furthermore, two (2) additional points should be reviewed as they are discussed in numerous other studies and have a direct bearing on this study. First, housing affordability is impacted more by the type of land-use regulations and processes that are in place than the sheer number of such regulations (Lowery and Ferguson, 1992) and secondly, growth management policies are not adopted in isolation, though often studies of these land-use regulations are studied in isolation. They are adopted as components of local *regulatory regimes*, defined as the sum of formal and informal institutions that regulate the delivery of housing and community services in a place. Housing prices are determined by a host of interacting factors such as price of land, supply and types of housing, the demand for housing and the amount of residential choice and mobility in an area. Traditional land-use regulations and growth management policies can raise the price of housing but in different ways (Nelson, Pendall, Dawkins, and Knaap, 2002). The Principal Investigators agree with the findings from the 2011 and 2010

Demographia Report, housing affordability concerns will intensify as households face higher tax burdens, decreased wage earning power, higher energy and transportation costs.

Based on the results of this study, local officials in Charlotte/Mecklenburg should: 1) consider all factors impacting housing affordability and not enact new land-use regulations in isolation; (2) identify the local *regulatory regimes* and incorporate them in the decision-making process; (3) review applicable processes as it relates to flexibility and impact on affordability on a regular basis; and (4) encourage housing developers and public sector housing proponents to form partnerships in the interest of building more affordable housing. The Principal Investigators found that given previous community-wide input and conversations between developers, affordable housing proponents and local officials, there is growing flexibility in Charlotte/Mecklenburg's processes. This environment should continue to be nurtured by implementing a process for ongoing community dialogue. Furthermore, the community-building partnerships mentioned above could result in a win/win/win strategy for stronger economic development and job creation, i.e. increased affordable housing development, a broader tax base, and an improved quality of life for residents.

As Charlotte's housing market rebounds from the recession, a number of other looming questions that could potentially further impact housing affordability, as well as availability should be included in the community-wide dialogue. A few of the questions that the community must answer and develop a consensus-based action plan for include, *how does Charlotte, with less available land to annex, continue to meet the demands of population growth; how does rising home prices and rental rates affect low income families and individuals still struggling with high unemployment and other aspects of the recent recession; and given shrinking federal and state assistance, what innovative incentives and financing tools can the unit of local government employ to assist in filling the "financial gaps" for developers and encourage affordable housing development.* These and the earlier questions of affordability and availability must be addressed to ensure that every citizen in Charlotte/Mecklenburg has access to safe, decent and affordable housing.

PART I - ECONOMIC IMPACT OF HOUSING DEVELOPMENT IN MECKLENBURG COUNTY, NORTH CAROLINA

Part I - Overview

This part of the study explores the economic impact of housing development in Mecklenburg County, North Carolina. It looks at the development of 1) single-family, owner-occupied homes, 2) multi-family, owner-occupied homes (condominiums and townhomes), and 3) multi-family, rental housing, or apartments.

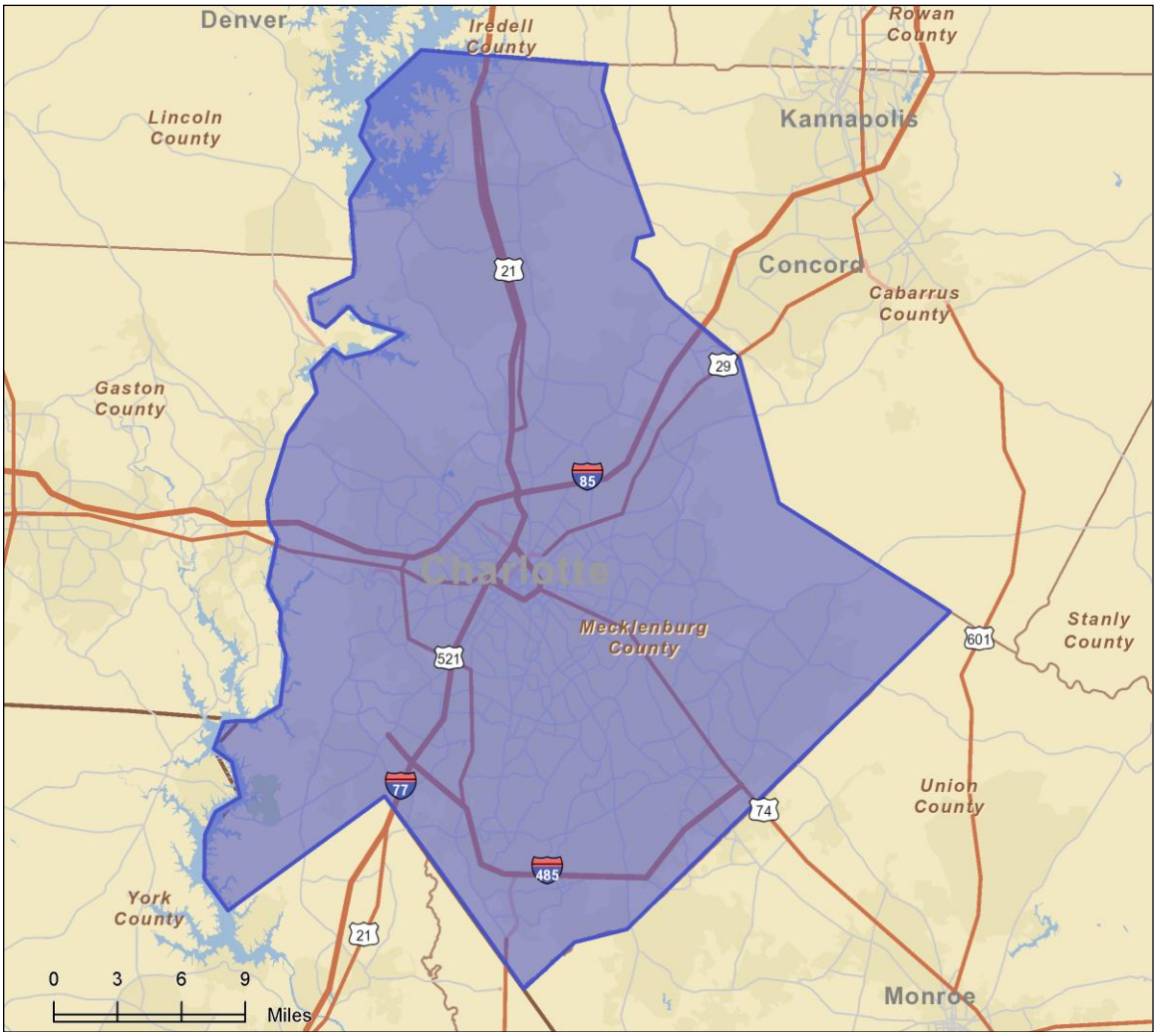
The first section provides an economic and demographic profile of Mecklenburg County. It presents key economic and demographic metrics with which to assess the overall impact of the housing sector. Section two lays out the methodology used to evaluate the impact of housing development. It explains the impact measures and provides overall estimates of the economic impacts stemming from housing development. In addition, it presents estimates of the total impact of housing development based on the volume of residential building permits in the county.

The third section provides estimates of the net fiscal impacts on local government finance arising from housing development. It assesses the impact of development activity on local government receipts and expenditures. Net fiscal impact is the difference between the revenues and expenditures generated by the development. If revenues are greater than expenditures, the development is described as having a positive net fiscal impact. A positive impact means that the surplus generated by the development will allow local tax rates to be lowered, the level of locally funded services to increase, or a combination of the two. In contrast, a negative impact raises the average cost of services to prior residents because they in effect subsidize the cost of services to new residents.

Mecklenburg County: Economic and Demographic Profile

Mecklenburg County is situated in southwestern North Carolina at the intersection of I-77 and I-85 (**Figure 1**). It is the largest of the state's 100 counties with a 2010 population of 919,628, or 9.6% of the state total.

Figure 1: Mecklenburg County



The population of the county has grown 2.83% annually since 2000, placing it among the fastest growing counties in the state. It is projected to grow 2.61% annually through 2015, compared to a projected national growth rate of 0.76%. The county is dominated by Charlotte, the state's largest city with a 2010 population of 711,349.[2]

In 2010, 62.2% of occupied housing units in the county were owner-occupied, compared to 65.8% nationally. Median household income in the county was $66,472 in 2010, or 122.1 % of the national average. A total of

[2] Population figures are from the NC State Data Center, http://sdc.state.nc.us/

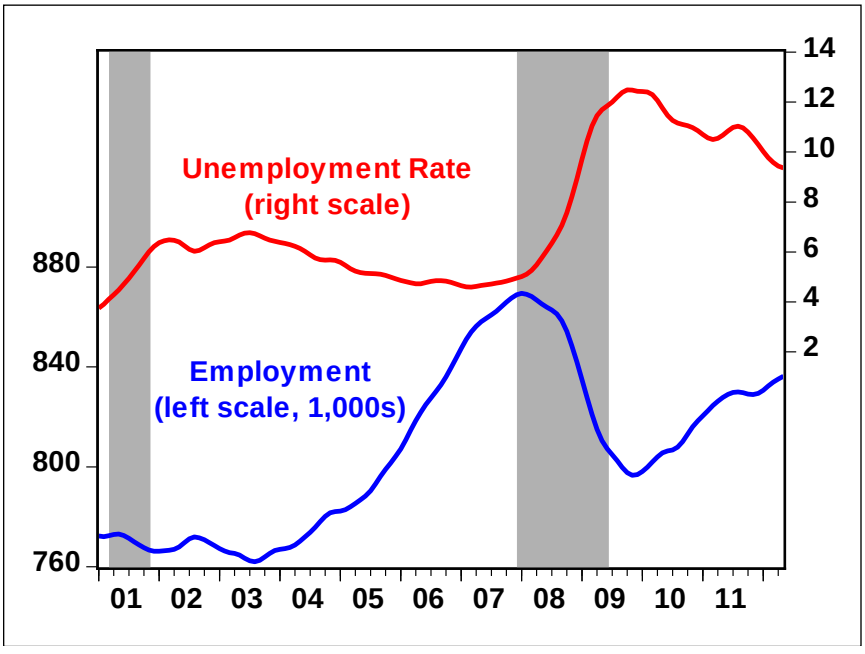
27.3% of households earned more than $100,000, while 64.3% earned more than $50,000. Average household income was $84,923.[3]

The median home value in the county was $176,005. The ratio of median home value to median household income was 2.65, compared to a national average of 2.90, which suggests that housing in Mecklenburg County is more affordable than in the nation as a whole. Average home value in the county was $227,912, and the ratio of average home value to average household income of homeowner households was 2.56.

Renter-occupied units accounted for 37.8% of all occupied units in the county in 2010. Median monthly rent in 2010 was $606, while the average gross rent was $714. In comparison, at the national level, median rent was $519, and average gross rent was $657. The ratio of average gross rent to average household income of renter households in Mecklenburg County was 19.8 %.

Economic activity and employment in the county suffered with the onset of the recent recession (**Figure 2**). From the start of the recession in December 2007 through May 2012, the county has lost some 32,600 jobs, a decline of 3.8%. The unemployment rate went from 5.0% in December 2007 to 9.4% in May 2012. Since the end of the recession in June 2009 through May 2012, county employment has risen 3.6%, but is still below its pre-recession peak.

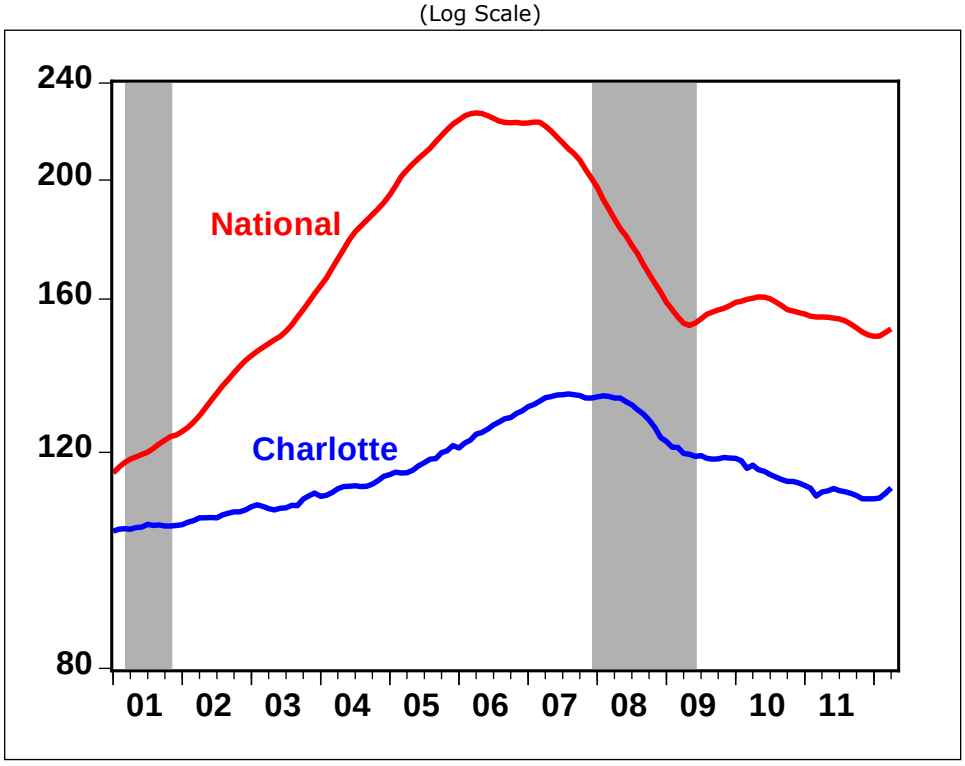
Figure 2: Mecklenburg County: Employment and Unemployment
Source: Bureau of Labor Statistics



[3] Income statistics and housing values are from ESRA, http://www.esribis.com/

The area housing market also has suffered along with the overall economy since the start of the recession (**Figure 3**). Area housing prices peaked in August 2007. Since then they have declined 16.2%, through April 2012. In comparison, housing prices nationally are down 28.7% during the same period. Recently, housing prices both in Charlotte and the nation as a whole have recorded a modest upturn.

Figure 3: Housing Prices Charlotte and the Nation
(Log Scale)



Source: Case-Shiller Housing Price Index

Economic Impact of Residential Development in Mecklenburg County

The analysis presented here examines the economic impact of new real estate development in Mecklenburg County, NC. Economic impact is measured in terms of 1) total number of new jobs created, 2) the total amount of additional labor income, 3) total value added (the sum of all final goods and services produced, or what is regional GDP), 4) total additional output (or business revenues) of all industries in the area, and 5) total amount of additional city and county tax revenue.

The analysis is conducted using the IMPLAN® (IMpact Analysis for PLANing) input-output model that divides the economy into sectors, defined by the good or service produced, where the outputs of one sector are inputs of another. IMPLAN analyzes a computer model that contains 509 sectors of the local economy and reflects the existing structure of the economy using data from the U.S. Department of Labor, Bureau of the Census, and the Bureau of Economic Analysis. IMPLAN was originally developed by the U.S. Forest Service and the University of Minnesota and is now marketed by Minnesota IMPLAN Group, Incorporated. Active users of the IMPLAN model include: NC Dept of Commerce and the NC Department of Parks, Recreation, & Tourism Management.

Figure 4: Calculating the Economic Impact of Residential Real Estate Development

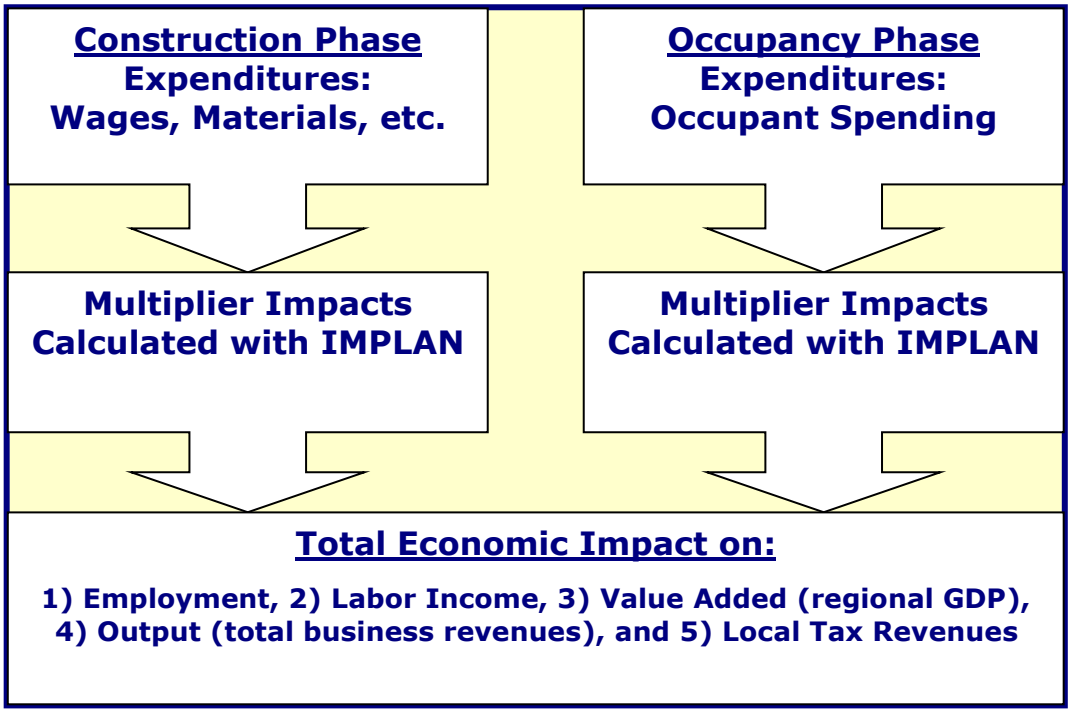


Figure 4, on the preceding page, sketches the methodology used to calculate the economic impacts of residential real estate development. In the construction phase, expenditures for wages, materials, etc. generate multiplier impacts on output, employment, income, etc. The impacts are calculated using the IMPLAN model. Similarly, in the occupancy phase, the expenditures of new residents generate multiplier impacts which again are tabulated using the IMPLAN model. The total impact of the new development is the sum of the impacts generated in the construction and occupancy phases of the project.

During the construction phase, economic benefits arise from the direct and indirect effect of monies spent on wages, materials, and other services. As these monies are re-spent in the local economy, multiplier effects are generated leading to further increases in output (business revenues), income, and employment. When the new residential development is occupied, the spending of new residents continues to affect the level of area economic activity, assuming that the new residents will not live in the area if new development is not put in place.[4] The spending of new resident households produces multiplier effects on the economy as these monies are re-spent in the local economy stimulating the growth of output, income, and employment.

Table 1 presents estimates of the economic impact of 1) new single-family, owner-occupied homes, 2) multi-family, owner-occupied homes (condominiums and townhomes), and 3) multi-family, rental housing, or apartments. The value of new single- and multi-family, owner-occupied structures was estimated using data from the Charlotte Metro-Study for 2010.4 through 2011.3.[5] The value of new apartment construction was estimated based on a survey of local developers.[6] The developer survey also provided information on the cost of raw land and the construction cost of new housing.

[4] The assumption is that in the long-run, if there is no new construction, potential new residents will choose to live elsewhere.

[5] Thanks are owing to Mr. Billy Miley for providing access to the Metro-Study data.

[6] The members of the panel included: Mark Boyce (True Homes), Dean DeVillers (Levine Properties), Bert Green (Habitat, Charlotte), and Roger Lewis (retired). None of the panel members bear any responsibility for the data and findings presented in the study.

Table 1: Economic Impact of Residential Development

	Construction Phase	Occupancy Phase	Avg. Ann. Impact through 1st 10 years of Operation	Net Present Value of 1st 10 years of Operation	Average Annual Impact Through the 1st 10 years of Operation Per $1,000,000 of Construction Cost
Single-Family Owner-Occupied					
Construction Expenditure	$243,624	n.a.	n.a.	n.a.	n.a.
Employment	2.73	0.68	0.87	n.a.	3.56
Labor Income	$125,073	$28,691	$37,453	$344,022	$153,733
Total Value Added	$184,775	$53,519	$65,451	$595,059	$268,656
Output	$399,227	$82,956	$111,708	$1,030,844	$458,527
Age. Income/Worker	$45,815	$42,078	$43,146	$372,214	$177,102
Local Tax Revenue	$7,182	$8,581	$8,454	$73,827	$34,700
Multi-Family Owner-Occupied					
Construction Expenditure	$189,104	n.a.	n.a.	n.a.	n.a.
Employment	2.12	0.54	0.68	n.a.	3.60
Labor Income	$97,083	$23,115	$29,839	$273,622	$157,794
Total Value Added	$143,424	$42,894	$52,033	$472,436	$275,157
Output	$309,885	$66,635	$88,749	$817,648	$469,312
Age. Income/Worker	$45,815	$43,002	$43,798	$379,426	$231,607
Local Tax Revenue	$5,576	$6,690	$6,589	$57,540	$34,844
Multi-Family Renter-Occupied					
Construction Expenditure	$104,500	n.a.	n.a.	n.a.	n.a.
Employment	1.17	0.53	0.59	n.a.	5.61
Labor Income	$53,649	$21,245	$24,191	$217,275	$231,493
Total Value Added	$79,257	$39,261	$42,897	$382,401	$410,496
Output	$171,244	$62,109	$72,030	$649,040	$689,283
Age. Income/Worker	$45,815	$40,296	$41,299	$358,322	$395,210
Local Tax Revenue	$3,082	$4,302	$4,191	$36,512	$40,103

Table 1 separates the impact of the construction phase that arises because of construction expenditures from the impact that occurs during the occupancy phase. The table shows the average impact through the first 10 years of occupancy, assuming that the construction phase lasts one full year. Also shown are the present values of the impact measures which are calculated assuming a 4.0 % rate of discount.[7]

The impacts on local property taxes, sales taxes, and other tax revenues are calculated using the IMPLAN model and data on the average taxes paid in Mecklenburg County, which are shown in **Appendix A**. Property taxes on the new development are assessed during the occupancy phase. The weighted average tax rate for residential development in the county is estimated at $1.207 per $100 valuation. Details of the calculation of this rate are shown in **Appendix B**.

The average single-family, owner-occupied home in 2011 had a construction cost of $243,624, excluding the cost of the raw land. The total cost of the new structure averaged $256,447. The average income of the household that occupies the new structure is estimated at $100,175, or 39% of the total cost of the structure. Households purchasing the new homes are estimated to spend 2.56 times their income on housing.

Development of the new single-family, owner-occupied structure is estimated to generate an average of $111,708 per year in additional output (or business revenues) in the county from the initiation of construction through the first 10 years of occupancy (**Table 1**). The present value of the additional output is $1,030.844. The average employment gain is 0.87 net new jobs, with an average wage of $43,146.[8] The new development is estimated to generate an additional $8,454 in local tax revenues annually through the first 10 years of operation. The present value of the additional tax revenue is $73,827.

The last column in **Table 1** shows the average annual impacts per $1,000,000 of construction expenditure. Single-family development is estimated to generate $458,527 in additional output per $1,000,000 of construction expenditure. Likewise, it creates 3.56 new jobs and $34,700 in additional local tax revenue each year per $1,000,000 of construction expenditure.

The average multi-family, owner-occupied structure (condo or townhome) had a construction cost of $189,104. The total cost of the unit, including the raw land, was $199,056. The average income of the household that purchases the new multi-family unit is estimated at $77,756. Households purchasing the new condos and townhomes are estimated to spend 2.56 times their income on housing.

[7] This rate approximates the long-term municipal bond rate over the past two years, see http://www.federalreserve.gov/releases/h15/data/m/slbond.txt.
[8] The average wage in the county 2010 was $54,496.

Development of a new multi-family, owner-occupied housing unit is estimated to generate an average of $88,749 per year in additional output (or business revenues) in the county from the initiation of construction through the first 10 years of occupancy. The present value of the additional output is $817,648. The average employment gain is 0.68 net new jobs, with an average wage of $43,798. The new development is estimated to generate an additional $6,589 in local tax revenues annually through the first 10 years of operation. The present value of the additional tax revenue is $57,540. Multi-family, owner-occupied development is estimated to generate $469,312 in additional output per $1,000,000 of construction expenditure. It creates 3.60 new jobs and $34,844 in additional local tax revenue each year per $1,000,000 of construction expenditure.

The average multi-family, renter-occupied structure (apartment) had a construction cost of $104,500. The total cost of the unit, including the raw land, was $110,000. The average income of the household that rents the new multi-family unit is estimated at $62,485. Households renting new apartments are estimated to spend 19.8% their income on housing, and the average new apartment unit is estimated to rent for $1,031 per month, based on data from the Real Data Apartment Index for September 2011.

Development of a new multi-family, renter-occupied housing unit is estimated to generate an average of $72,030 per year in additional output (or business revenues) in the county from the initiation of construction through the first 10 years of occupancy. [9] The present value of the additional output is $649,040. The average employment gain is 0.59 net new jobs, with an average wage of $41,299. The new development is estimated to generate an additional $4,191 in local tax revenues annually through the first 10 years of operation. The present value of the additional tax revenue is $36,512. Multi-family, renter-occupied development is estimated to generate $689,283 in additional output per $1,000,000 of construction expenditure. It creates 5.61 new jobs and $40,103 in additional local tax revenue each year per $1,000,000 of construction expenditure.

The numbers shown in the right-most column of **Table 1** are impact multipliers that can be used to estimate the total impact of new development in the county. For example, the Census Bureau estimates that $373,988,882 of residential building permits were issued in 2010. These permits represent *planned* construction expenditures. Assuming that this volume of residential construction was actually put in place, the value of permits can be used to estimate the impact of residential development on the Mecklenburg county economy.[10]

[9] The analysis assumes a 5-percent vacancy rate during the occupancy phase.

The impact multipliers from the right-most column of **Table 1** are shown in column (1) of **Table 2**. Multiplying the multipliers in column (1) times the value of permits in millions yields the estimated economic impacts shown in column (2).

Table 2: Economic Impact of Residential Development in 2010

	(1) Average Annual Impact Through the 1st 10 Years of Operation Per $1 million of Construction Cost	(2) Estimated Economic Impact
Single-Family, Owner-Occupied Housing		
Employment	3.56	1,095
Labor Income	$153,733	$47,248,323
Total Value Added	$268,656	$82,568,968
Output (Bus. Revenue)	$458,527	$140,923,824
Avg. Income/Worker	$177,102	$54,430,465
Local Tax Revenue	$34,700	$10,664,582
Multi-Family, Owner-Occupied Housing		
Employment	3.60	19
Labor Income	$157,794	$844,120
Total Value Added	$275,157	$1,471,953
Output (Bus. Revenue)	$469,312	$2,510,584
Avg. Income/Worker	$231,607	$1,238,984
Local Tax Revenue	$34,844	$186,397
Multi-Family, Renter-Occupied Housing		
Employment	5.61	344
Labor Income	$231,493	$14,190,251
Total Value Added	$410,496	$25,162,942
Output (Bus. Revenue)	$689,283	$42,252,323
Avg. Income/Worker	$395,210	$24,225,915
Local Tax Revenue	$40,103	$2,458,289
Total		
Employment	n.a.	1,458
Labor Income	n.a.	$62,910,527
Total Value Added	n.a.	$110,242,495
Output (Bus. Revenue)	n.a.	$184,415,131
Avg. Income/Worker	n.a.	$78,842,777
Local Tax Revenue	n.a.	$13,122,871

[10] The volume of residential permits issued in Mecklenburg County in 2010, based on Census estimates is as follows:

Building Permits, 2010	Units	Value
Single-Family, owner-occupied	1,833	$307,340,469
Multi-Family, owner-occupied	73	$5,349,502
Multi-Family, renter-occupied	835	$61,298,911
Total	2,741	$373,988,882

Single-family development in 2010 is estimated to have created an economic annuity that generates $140,923,824 in additional output, or business revenue, in the county each year through the first 10 years of occupancy. It fostered an estimated 1,095 net new jobs and $47,248,323 in additional labor income. In the process, development generated $10,664,582 in extra tax revenue annually at the local level.

In total, residential development in 2010 stimulated a stream of new business revenues estimated at $184,415,131 annually. It created 1,458 new jobs and $13,122,871 in extra tax revenues each year for local governments. The estimated present value of the additional business revenues in 2010 is $1.5 billion and the present value of the added tax revenues is $115 million.

In evaluating the economic impact of the housing industry, it should be noted that the economic impact estimates presented in **Table 2** are drastically reduced because of the recession that has devastated the building industry since 2007. Residential building permits in the county in 2010 were 76.5% below the level recorded in 2004, after adjustment for inflation. If building activity were again to reach the 2004 level, the estimated presented in **Table 2** would be increase by a factor of almost four.[11]

[11] In 2004, residential permits totaled $1,590,071,472, adjusted for inflation. Applying the impact multipliers show in Table 4 to the dollar value of permits yields the following estimates of the economic impact of residential development in 2004:

Total Estimated Economic Impact, 2004	
Employment	5,203
Labor Income	$224,062,521
Total Value Added	$391,913,350
Output (Bus. Revenue)	$668,195,197
Avg. Income/Worker	$266,981,129
Local Tax Revenue	$49,814,599

Fiscal Impact Analysis of Residential Development in Mecklenburg County

Fiscal impact analysis seeks to show the effects of new development on local government budgets.[12] It assesses the impact of development activity on both government receipts and expenditures. Net fiscal impact is the difference between the revenues and expenditures generated by a proposed land-use or development scenario. If revenues are greater than expenditures, a project or scenario is described as having a positive net fiscal impact.

The pessimism with which many planners and government officials view new residential development stems from the findings of numerous fiscal impact studies which over the years have advanced the view that new residential development is a losing proposition for local governments.[13] Consulting firms like TischlerBise and others have produced hundreds of studies of communities across the country that generally stress the negative implications of expanding residential development.[14] The common conclusion of these studies is that the households inhabiting new housing tend to pay property and other local taxes that fall short of the costs of public services consumed. Elementary and secondary education is commonly implicated as the major public service cost associated with such households.

The American Farmland Trust (ATF) has developed and supported a variant of fiscal impact analysis that it has dubbed cost of community services (COCS) studies. This methodology compares the annual revenues and expenses that are associated with different land-use categories. The analysis produces a series of ratios showing the proportional relationship of revenues and expenses for each particular land-use. A ratio that is greater than one indicates that expenses are larger than revenues and, thus, suggests that the land-use is a loser for local governments. AFT and others have undertaken more than 80 COCS studies across the country. These studies generally indicate that residential development is associated with higher taxes and service demands on local governments.[15]

Not all studies of residential development are so pessimistic about the impact of new housing development. Dotzour (1998), examining housing development in Texas, shows that new housing development generates strong economic benefits and improves the fiscal condition of local

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[12] Robert W. Burchell *et al*., *The Costs of Sprawl Revisited* (Washington, D.C.: Transportation Research Board, National Academy of Science Press, 1998), Robert W. Burchell *et al*., *The Fiscal Impact Handbook: Estimating Local Costs and Revenues of Land Development* (New Brunswick, NJ: Center for Urban Policy Research, 1978), and Michael L. Siegel and Susan Robinson, "Fiscal Impact Analysis: What It Is and How to Use It," The Government Finance Officers Association, Research Bulletin, September 1990.

[13] See, for example, Alan A. Alshuler and Jose A. Gomez-Ibanez, *Regulation for Revenue: The Political Economy of Land Use Exactions* (Washington, DC; The Brookings Institution, 1993), Chapter 6.

[14] See, http://www.tischlerbise.com/pages/fiscalimpact.asp

[15] American Farmland Trust, *Cost of Community Services Studies: Making the Case for Conservation* (Washington, DC, 2002).

governments. The National Association of Homebuilders (1997) reports that Dotzour's conclusions apply generally to communities across the country.[16] In Massachusetts, work by Nakosteen and Palma (2003) finds that new housing development is not inevitably followed by increased demands for services and higher municipal cost. Their report shows that many of the fastest growing communities in Massachusetts have experienced the slowest growth in per capita tax burdens during the 1990s.

It is difficult to estimate precisely the level of government services consumed by any group of persons or employees. The standard adopted here is to compare the average local government revenues generated per capita by the development in the first 10 years of the occupancy phase with the average revenues collected from residents currently in the county. This approach assumes that new residents consume the same mix of local government services as existing residents.[17] If the average level of revenues generated is greater than the current average of all persons in the county, the project is presumed to produce a positive net fiscal impact. A positive impact means that the surplus generated by the proposed project will allow local tax rates to be lowered, the level of locally funded services to increase, or a combination of the two. In contrast, a negative impact raises the average cost of services to prior residents because they in effect subsidize the cost of services to new residents.[18]

In evaluating the impact of new real estate development on local government in Mecklenburg County, it is important to understand clearly the magnitude of current revenue collections. **Appendix A** shows the amount of revenue collected by the county's eight governmental units in 2010. The data are from the North Carolina Department of State Treasurer.

Total revenues were $3,637,640,592 or $3,939 per capita. But $1,174,908,919, or $1,272 per capita, was from intergovernmental transfers and debt proceeds which should be excluded in a comparison with new development because they do not originate from the direct taxation of current local residents. If these two sources are excluded, the average revenue collected by local government from residents was $2,667 in 2010.

Table 3 presents a fiscal analysis of housing development in Mecklenburg County. Column (1) of the table shows the average additional yearly local tax revenue generated by development during the occupancy phase. It is taken from **Table 1**.

[16] See, http://www.nahb.org/generic.aspx?sectionID=784&genericContentID=35601

[17] The same approach was employed in Mark G. Dotzour, "New Subdivisions Pay Their Own Way," *Terra Grande*, January 1998, pp. 1-5.

[18] The analysis ignores the permit fees and other charges paid by developers for zoning requests, inspections, utility hookups, etc. The assumption here is that the level of these fees approximates the cost to local government of providing the associated services, and, therefore, the revenue impact is assumed to be neutral.

Table 3: Fiscal Analysis of New Real Estate Development in Mecklenburg County

Property Type	(1) Avg. Ann. Addition to Local Tax Revenues through the 1st 10 years of Operation	(2) Added Population	(3) Added Revenue Per Capita	(4) Expected County Revenues Per Capita*	(5) Net Fiscal Surplus or (Deficit) Per Capita	(6) Total Ann. Net Fiscal Surplus or (Deficit)	(7) Net Present Value of 1st 10 years of Operation	(8) Net Present Value per $1,000,000 of Project Cost
Single-Family, Owner-Occupied	$8,581	2.64	$3,249	$2,764	$485	$1,281	$10,390	$42,648
Multi-Family, Owner-Occupied	$6,690	1.52	$4,406	$2,287	$2,119	$3,217	$26,093	$137,981
Multi-Family, Renter-Occupied	$4,302	1.75	$2,452	$2,420	$32	$56	$454	$4,347

*Revenues are adjusted to reflect differences in the average number of school-age children and number of automobiles as they affect city and county expenditures on education and transportation.

Column (2) shows the expected additional population generated by development. Expected population is calculated by taking the number of new residents projected to occupy the new developments. In normal times, the population of the county might also be expected to grow because of the additional employment generated in the occupancy phase. However, in the current environment with high unemployment and surplus labor, the additional employment will likely easily be met by employing unemployed persons in the county rather than drawing in in-migrants from outside the area.[19]

Column (4) shows expected local tax revenues collected at the combined city and county level per capita. If every new resident consumed the same level of city and county services as existing residents, local governments would expect to collect $2,667 per capita, the actual average local tax revenues collected per capita in 2010.

Census data reveal that households differ for the average county household in the number of school-age children they have and the number of automobiles they own (see **Appendix C**). Single-family households have 9.3% more school-age children and 18.8% more automobiles; while multi-family, owner-occupied households have only 25.6% as many children and only 65.0% as many automobiles. Adjusting the average revenue figure for these differences in school-age children and number of automobiles shows that single-family residents should expect to pay $2,764 per capita, multi-family, owner-occupied households $2,287 per capita, and multi-family, renter-occupied households $2,420 per capita. These figures are included in **Table 3, Column (4)**.[20]

Column (5) shows the expected net fiscal surplus on a per capita basis. Column (7) shows the net present value of the annual surplus through the first 10 years of occupancy calculated at 4.0 %. Column (8) shows the net present value of the surplus standardized per $1,000,000 of construction expenditure. Single-family, owner-occupied development is estimated to produce an annual fiscal surplus of $485 per capita, or a total of $1,281 annually for each unit. The net present value of the surplus calculated through the first 10 years of the occupancy phase is $10,390 per unit, using

[19] In October 2010, the unemployment rate in Mecklenburg County was 10.0%, with some 46,000 persons out of work.

[20] The adjustments are calculated as shown the following table:

	Population	School	Autos	Other	Total
Single-Family, Owner	2.64	$383	$406	$1,975	$2,764
Multi-Family, Owner	1.52	$90	$222	$1,975	$2,287
Multi-Family. Renter	1.85	$228	$218	$1,975	$2,420

In the education and transportation columns, the adjusted estimates are calculated by taking the average expenditure figure ($2,667) times the share of that type of expenditures in the county budget times the relative share of the housing class. For example, the education adjustment for single-family housing is $2,667 * 0.131 * 1.093 = $383.

a 4.0% discount rate. The net present value of the surplus per $1,000,000 of residential construction expenditures is $42,648.

The value of planned single-family residential development in 2010 was $307,340,469. Multiplying this amount in millions (307.3) times the multiplier in **Column 8 of Table 3** suggests that the net present value of the fiscal surplus generated by residential construction planned in 2010 amounts to $13,105,730 through the first ten years of occupancy.

Multi-family, owner-occupied development shows an annual fiscal surplus of $2,119 per capita, or $3,217 annually per unit. The net present value of the surplus calculated through the first 10 years of the occupancy phase is $26,093 per unit. The net present value of the surplus per $1,000,000 of multi-family, owner-occupied construction expenditures is $137,981.

Multi-family, renter-occupied development shows a very modest annual fiscal surplus of $32 per capita, or $56 annually per unit. The net present value of the surplus calculated through the first 10 years of the occupancy phase is $454 per unit. The net present value of the surplus per $1,000,000 of apartment construction expenditures is $4,347.

The small net fiscal surplus produced by apartment development is not surprising given that the average income of apartment households is below the average income of all county households. In 2010, average household income in Mecklenburg County was $84,923 while the average income of new renter households in this study is estimated at $62,485. Moreover, the average cost of a new apartment ($110,000) is less than the average value of a new owner-occupied home ($256,447), resulting in lower property tax revenues compared to owner-occupied, single-family housing.[21]

[21]Although apartment development may not generate a large fiscal surplus for local governments, it is nevertheless an important housing alternative. Lower income residents (teachers, policemen, firemen, etc.) cannot all afford to live in expensive new homes. A study by the Urban Land Institute suggests that apartment development is an efficient way to provide housing for lower-income households:

- By housing more people on less land, apartment development makes possible the preservation of more open space and natural features than do single-family housing developments.
- The higher densities of apartment developments reduce developmental pressures on the remaining underdeveloped land in an area.
- Because apartment development is more compact, it causes less land disturbance and creates fewer impervious surfaces, reducing water run-off and drainage problems.
- Apartment development that is clustered along transportation corridors make various kinds of mass transportation more feasible.
- Because apartment units tend to be smaller than single-family homes, apartment units consume less electricity and water per housing unit.
- The compactness of apartment development creates efficiencies that make it easier and cheaper to pick up trash and recyclables and deliver mail.

Table 3 compares per capita revenues from new development to the average revenues assessed for county and municipal services. This approach is appropriate if the production of municipal services exhibit constant costs, where average cost equals marginal cost in the long run. Fiscal impact economists often suggest, however, that municipal service production is subject to increasing costs and, thus, the *marginal revenue* from new development should be compared to the *marginal cost* of municipal service production.[22]

Table 4: County and Municipal Service Costs

Year	Population	CPI	Total Expenditures less Proceeds from Debt and Inter-government Transfers	Inflation-Adjusted Total Expenditures less Proceeds from Debt and Inter-government Transfers
2005	798,701	194.50	$1,826,350,762	$2,046,686,601
2006	831,507	202.90	$2,141,147,550	$2,300,124,326
2007	862,177	208.35	$2,250,334,516	$2,354,161,049
2008	887,991	218.82	$2,125,178,415	$2,116,923,032
2009	908,704	215.69	$2,940,150,060	$2,971,120,100
2010	923,427	217.97	$2,234,379,436	$2,234,379,436

Although it is difficult to determine precisely the marginal cost of government services, a simple approach is to compare the change in inflation-adjusted expenditures over time to the change in population. **Table 4**, drawing on data from **Appendix A**, shows total county and municipal government expenditures less proceeds for debt and inter-government transfers. This number represents annual service expenditures financed by county residents.

From 2005 through 2010, the change in county population was 124,726 persons, while the change in inflation-adjusted county and municipal spending was $187,692,835. Dividing the change in real expenditures by the change in population, suggests the marginal cost of services is $1,505 per person. This estimate of marginal cost is substantially less than the average revenue per capital generated by new residential development (or what can be termed the marginal revenue from new development) shown in **Table 3** and suggests that new development more than pays its way.

The foregoing list of potential benefits if fully priced may potentially expand the fiscal surplus estimated here and suggests that apartment development merits an important place in any overall housing development strategy. See, Richard M. Haughey, *The Case for Multifamily Housing* (Washington, DC: Urban Land Institute, 2003).

[22] Alan A. Alshuler and Jose A. Gomez-Ibanez, *Regulation for Revenue: The Political Economy of Land Use Exactions* (Washington, DC: The Brookings Institution, 1993).

Appendix A: Mecklenburg County Consolidated Governmental Revenues and Expenditures, 2010-2005

	2010	2009	2008	2007	2006	2005	Avg. Ann. % Chg.
Revenues:							
Property Taxes	$1,245,846,420	$1,207,164,695	$1,164,848,008	$1,089,923,514	$1,051,819,810	$925,379,192	6.1%
Other Taxes	$25,413,400	$28,553,187	$34,862,301	$38,926,433	$36,109,588	$33,743,483	-5.5%
Utilities	$282,428,039	$265,657,168	$265,029,480	$255,107,847	$246,773,601	$200,594,082	7.1%
Sales Tax	$327,174,446	$347,741,888	$418,277,794	$404,381,148	$369,109,845	$340,287,209	-0.8%
Sales & Services	$303,210,213	$311,537,854	$331,683,776	$301,767,830	$281,601,975	$226,435,666	6.0%
Intergovernmental	$447,339,263	$442,026,495	$488,930,140	$454,471,698	$385,173,739	$378,979,148	3.4%
Debt Proceeds	$727,569,656	$446,364,404	$755,257,219	$533,283,038	$645,258,938	$680,408,744	1.3%
Other Miscellaneous	$278,659,155	$278,215,845	$424,024,725	$541,145,393	$395,627,126	$316,070,506	-2.5%
Total	$3,637,640,592	$3,327,261,536	$3,882,913,443	$3,619,006,901	$3,411,474,622	$3,101,898,030	3.2%
Expenditures:							
Education	$447,536,897	$645,534,280	$541,957,030	$492,553,786	$506,099,055	$441,881,759	0.3%
Utility	$279,618,743	$294,341,847	$307,249,246	$308,080,862	$365,057,808	$313,149,648	-2.2%
Debt Service	$667,645,519	$685,808,167	$551,292,774	$538,743,226	$484,821,342	$442,803,249	8.6%
Human Services	$336,953,536	$330,963,288	$323,588,719	$297,147,805	$298,524,967	$318,362,408	1.1%
Transportation	$437,411,936	$519,376,936	$454,579,589	$522,429,800	$485,311,070	$356,709,828	4.2%
General Government	$189,183,405	$223,159,991	$221,962,675	$196,394,713	$225,598,538	$198,292,449	-0.9%
Public Safety	$523,466,052	$522,810,976	$490,287,587	$467,354,164	$408,795,103	$380,455,753	6.6%
Other	$527,472,267	$606,545,474	$478,448,154	$415,384,896	$397,372,344	$434,083,560	4.0%
Total	$3,409,288,355	$3,828,540,959	$3,369,365,774	$3,238,089,252	$3,171,580,227	$2,885,738,654	3.4%
Population	923,427	908,704	887,991	862,177	831,507	798,701	2.9%
CPI-U	217.97	215.69	218.82	208.35	202.90	194.50	2.3%
Employment	682,030	685,857	715,455	711,111	676,448	645,094	1.1%

Note: Shows consolidate revenues and expenditures for Mecklenburg Co. and the cities of Charlotte, Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville
Source: N.C. Department of State Treasurer, see: http://www.treasurer.state.nc.us/dsthome/StateAndLocalGo

Appendix B: Mecklenburg County Property Tax Rates

	County Rate	Municipal Rate	Combined Rate	Population	Weight	Weighted Rate
Mecklenburg	.8166	n.a.	.8166	894,290	5.4%	0.0439
Charlotte	.8166	.4370	1.2536	711,349	79.5%	0.9972
Cornelius	.8166	.2500	1.0666	24,847	2.8%	0.0296
Davidson	.8166	.3500	1.1666	10,822	1.2%	0.0141
Huntersville	.8166	.2825	1.0991	41,216	4.6%	0.0507
Matthews	.8166	.3025	1.1191	29,209	3.3%	0.0366
Mint Hill	.8166	.2700	1.0866	21,048	2.4%	0.0256
Pineville	.8166	.3200	1.1366	7,747	0.9%	0.0098
Weighted Rate					100.0%	1.2074

Source: http://www.dornc.com/publications/propertyrates.html

Appendix C: Mecklenburg County Households, 2010

	Population in Households	Average Household Size	Number of Households	Number of School-Age Children	School-Age Children per Household	Number of Autos	Autos per Household
Total	868,011	2.48	350,392	158,642	0.45	597,349	1.70
Owner-Occupied	567,052	2.59	219,296	103,906	0.47	430,187	1.96
Single-Family	543,004	2.64	205,578	101,735	0.49	361,867	1.76
Multi-Family	15,573	1.52	10,257	1,188	0.12	11,373	1.11
Renter-Occupied	300,959	2.30	131,096	55,213	0.42	167,162	1.28
Multi-Family	178,448	1.85	96,633	28,489	0.29	104,703	1.08

Source: 2010 Census (ACS 5-yr.) and estimates by the author.

PART II – ECONOMIC CONSEQUENCES OF LAND-USE REGULATIONS ON HOUSING PRICES, AFFORDABILITY, AND JOB CREATION IN MECKLENBURG COUNTY, NORTH CAROLINA

Part II - Overview

As evidenced in Part I of this study, it is clear that the housing industry in Mecklenburg County, North Carolina has a positive impact on the local economy even during the recent period of recession that devastated the industry. Now we turn our attention to another facet of the housing industry in Charlotte/Mecklenburg that could potentially decrease the economic impact discussed in Part I and have debilitating consequences in regard to the availability of affordable housing.

Housing affordability is a major topic of conversation around the world, and it is the focus of a vast amount of research. Although available quantitative data sources about land-use regulations' impact on affordable housing in Charlotte/Mecklenburg are limited, numerous reports from organizations that focus on housing, as well as related City of Charlotte and various community-base organizations' meetings provide a clear picture of an affordable housing challenge for many residents. Like many cities across the nation and beyond, Charlotte has a "smart growth" strategy designed to facilitate achieving its growth and revitalization goals (Smart Growth, 2007, January). One of the main principles of the Charlotte/Mecklenburg "Smart Growth" Strategy is to "sustain effective land-use decisions," an important function of land-use regulations. This part of the study analyzes the economic impact of those land-use regulations on housing affordability in Charlotte/Mecklenburg.

Perhaps the most comprehensive and compelling research on the issue of housing affordability is the results from the Demographia International Housing Affordability Survey: 2012, where affordability is determined by using the "Medium Multiple" (medium house price divided by gross [before tax] annual median household income) to rate housing affordability, an approach that has been recommended by the World Bank and the United Nations and one that is used by the Harvard University Joint Center on Housing (Cox and Pavletich, 2012). This analysis of the economic impact of land-use regulations on affordable housing in Charlotte/Mecklenburg is based on the data from the Demographia Survey results of the International Housing Affordability Rankings: All Markets Using Median Multiple (House Price/Median Household Income). This ranking indicates that Charlotte ranks at 113 of the 325 metropolitan markets (in Australia, Canada, Hong Kong, Ireland, New Zealand, the United Kiingdom, and the United States) on the International Affordability ranking, 23 (of 64) on the major market affordability ranking, and 85 (of 190) on the national affordability ranking relative to the median price of housing [$171,000] and median household income [$57,000]).

In addition to the use of Demographia's "Median Multiple" cost calculation, this study employs two (2) other models of cost calculations for determining housing affordability, the 2011 National Association of Home

Builders (NAHB)/Wells Fargo Housing Market Index model and the 80/20 Rule, along with the associated "multipliers" for both models. In addition, two (2) abbreviated case studies of current development projects will be reviewed. The Literature Review and the Results and Conclusions sections will also provide a limited discussion on the Wharton Regulation Index, as well as other noteworthy indices.

Selected Literature Review

Although there are numerous research articles and reports about the economic impact of land-use regulations on housing affordability, this study focuses on selected portions of literature that is concerned with the overall impact of supply and demand on housing prices relative to issues of affordability**.**

Housing Pricing: Supply and Demand

The price of a house like the price of any product or service is determined by its supply and demand. The demand side factors include income, population growth, employment, population density, etc. As Glaeser (2004) pointed out, the demand factors have been considered central to the determination of housing prices. Mankiw and Weil (1991) studied the impact of demographics on housing demand and found that many factors resulted in the upward shift of the demand curve, resulting in the upward shift in housing prices. Only recently has the supply side of housing prices been examined. In fact, a special issue of the Journal of Real Estate Finance and Economics was devoted to discussing the special features of housing supply (Rosenthal, 1999).

A portion of the literature review undertaken for this study focuses on the supply side and examines the impact of regulations on housing prices and on the number of new permits issued, as well as new starts. Ultimately, the research examines the impact of regulations on housing affordability.

Impact of Regulation on Housing Prices

The literature is clear that increases in land-use regulation stringency decreases the elasticity of supply and thus leads to increases in prices. For example, the study by Black and Hoben (1985) created three categories of regulations: restrictive, normal, and permissive for 30 US metropolitan areas. They estimated a correlation of .7 between a regulatory index and pricing of developable lots. Segal and Srinivasan (1985) concluded that regulated cities have 1.7% faster annual price increases than unregulated cities. Guidry et al. (1991) analyzed the Urban Land Institute data and concluded that average lot prices were $26,000 higher in the regulated cities in 1990 than in the least regulated cities in the same period.

Eicher (2008b) studied the impact of land-use regulations on 250 US cities from 1989 to 2006. He found that the increase in housing prices was associated with the demand factors like median income growth, population growth, density, etc. When the Wharton Regulation Index was included in the model along with the other variables mentioned above, the model's explanation power grew by 20%. This means that the adjusted R^2 =.21 before Wharton Regulation Index's incorporation in the model and model power of explanation increased R^2 = .25 after Wharton Regulation Index was added as a variable in the model, but the coefficients of demand factors did

not change. This implies that the power of explanation has not come at the expense of demand factors. The regulation is a complementary variable in explaining the price growth. The Wharton Regulation measure is comprised of 11 sub indices, so the question is which index is important. Using the stepwise regression technique, the author was able to show that the permit approval process, statewide regulations, courts, state involvement in local land-use and growth management policies were statistically significant at the 10% level, 1% level, and 5% level respectively. The disaggregated model explains 35% more variation in housing prices than a model based on the Wharton Composite Index. The implications of the above discussion is that after adjusting for inflation, all regulatory measures combined added $409,332 to the San Francisco housing prices between 1989 to 2006.

Eicher (2008b) also examined the impact of regulation on five (5) cities of Washington State, between 1989 to 2006. After adjusting for inflation, he showed the regulation costs as a percent of 2006 housing prices in Seattle, Tacoma, Vancouver, Everett and Kent were 43%, 36%, 31%, 44% and 44% respectively. For example, this means that about $203,000 were added to the housing prices in Seattle, $125,000 in Kent, and $113,000 in Everett.

Gleaser and Ward (2009) studied the remarkable increase in housing prices between 1980-2004. The data set used for the analysis was collected by Pioneer Institute for Public Policy Research. The data contained information about 187 cities and towns in the greater Boston area. It contained information about minimum lot size, septic rules, and subdivision requirements. The authors analyzed the results of land-use regulations and concluded that the increase in prices in the Boston area was due to "man-made barriers to construction." The researchers found that an extra acre per lot was associated with 40% fewer permits between 1980 and 2002. The connection between land-use controls and prices was examined in a hedonic price regression. When they controlled for structural characteristics and fixed town characteristics, it was found that each acre per lot was associated with a 12% increase in housing prices. Land-use restrictions impact the price via changing density and demographic variables of the town. The land-use regulations do not maximize social welfare because densities are too low.

Green, Melpezzi, and Mayo (2005) estimated the supply elasticity of 45 US metropolitan areas based upon the model of Capozza and Helsley (1989) and Mayer and Sommerville (2000). They used data for the period of 1979 to 1996 to estimate supply elasticity of the various metro areas. They found that supply elasticities of different metropolitan areas were different. The supply elasticities were statistically greater than zero in 23 out of 45 cases. In the "sprawl cities", supply elasticities were greater than 10 for 12 metro areas, including Dallas (29.9), Atlanta (21.6), Phoenix (21.7), and Charlotte (17.0). The supply elasticities were greater than 3 for 14 cities. These cities include: San Francisco, Hartford, New Orleans, Boston, Chicago, etc. These cities are hemmed in geographically, compact or not growing.

The study concluded that "metropolitan areas that were heavily regulated, according to the measure developed by Malpezzi (1996) always exhibited low elasticity….lightly regulated, fast growth communities exhibit high price elasticities; lightly regulated but slow growing areas have low elasticities; and higher densities produce lower elasticities."

Fischal, in his book Regulatory Takings, Law, Economics and Politics, published by Harvard University in 1995, concludes that until 1970, California housing prices were similar to the rest of the nation. However, in the 1970s, California's median house price relative to the median income was 29% higher than the rest of the nation; by 1980 it was 75% higher and by 1990, it was 120% higher. This increase in rising housing prices cannot be attributed to construction cost, quality of California's life style, income of Californians, or the scarcity of land availability but to stronger land-use regulations implemented through the 1970s and through court decisions and administrative actions, all resulting in the increasing price trend.

Quigley and Raphael (2005) examined the linkages between land-use regulations, growth in housing stocks and prices in California. They used the hedonic model to measure prices and used Census Public Use Micro Data samples (PUMS) for 1990 and 2000 to estimate a constant quality housing price index for 407 California cities. The regulation was measured by 15 land control measures adopted in California. These were obtained from a survey of California land-use officials. The regulation stringency was measured by the numbers of growth control measures adopted by each city. They found that housing prices over a decade (1990 to 2000) were larger in the more regulated cities than less regulated cities. For example, each additional regulatory measure was associated with a statistically significant 3% (1990) and 4.5% (2000) increase in owner-occupied houses, and significant at 1% (1990) and 2.3 % (2000) increase in the price of rental units. The impact of regulation on the stock of housing was measured by the residential permits issued by each city between 1990 and 2000. Quigley and Raphael's study found that "housing prices and rents are indeed higher in cities with more stringent regulation of development and land-use".

Quigley and Raphael (2005) also examined the elasticity of housing supply between less regulated and regulated communities. It was determined that local land-use regulations restricting urban growth are likely to inhibit increases in the supply of housing available at a given point in time and do dampen the responsiveness of the housing stock to increases in demand overtime.

Mayer and Somerville (2000) examined the impact of land-use regulation on new construction. The model identified new construction or starts as a function of changes in house prices, cost of construction, and land-use-regulation. They used the log of new single-family building permits as a dependent variable. The independent variables they used were: (a) log of housing prices for the current and five lags periods, (b) changes in the real

prime rate to show the cost of capital, (c) measure of regulation: (c_1)months to receive the subdivision approval, (c_2)number of growth management policies, (c_3)development policies, and (d) natural log of population. They found that the regulations have a strong negative impact on MSA housing starts.

The model also examines the impact of regulation in the long run. It shows that starts elasticity in the current and lagged quarters increased from 15 to 18 for metro areas with little regulatory delay, but falls to 14.4 in metro areas with longer delays. Much of the decline occurs in the 3rd, 4th and 5th lagged quarters.

It is clear that regulations impact the behavior of the builders and trigger different behaviors in the short and long run in the regulated and non- or lower-regulated markets. This is because when demand increases in the regulatory markets, builders respond by using the inventory of the developed lots; and once these lots are exhausted, it takes longer to respond.

The studies cited above examined the impact of supply side factors on house prices in various metropolitan areas. The study by Jud and Winkler (2002) examined the impact of demand and supply factors on real house price changes. Their study encompassed 130 metropolitan areas for the period of 1984 to 1998. T heir findings were: (a) 1% change in the real per capita income would change the housing prices by .17%. The impact of real per capita income was statistically significant; (b) 1% change in the real stock price appreciation led to statistically significant total impact on house price of .16%. The real total impact is composed of current impact and one period lagged impact of S &P 500 on housing price changes. It should be noted that the real wealth effect has an impact in the housing market; (c) 1% change in the real after tax mortgage interest rate change brings .024% change in the house price appreciation; and (d) 1% change in the real population growth raises the housing values by 1.09%. They also examined the location specific fixed effect for the housing price appreciation. Jud and Winkler concluded even after controlling for independent variables cited above, 69 MSAs were statistically significant dummy variables suggesting that local factors also contribute to the understanding of real price appreciation of housing prices. The largest coefficients were found in the West Coast, Hawaii, North and East. The lower coefficients were found in South and Southwest, suggesting the lowest degree of house price appreciation due to availability of plenty of land and weak growth restrictions policies. The study was interesting because it showed that the magnitude of fixed effect coefficients of the various cities are positively correlated with the restrictive growth management policies and limited availability of land.

Issues of Affordability

It is clear from the above analysis that increases in land-use regulations decrease supply elasticity. This leads to an increase in price. So

houses become more expensive and the issue of affordability is created. This sentiment is well expressed by various economists and governmental agencies. For example, Kate Barker (2006), a member of the Monetary Policy Committee of the Bank of England noted in 2004 and 2006 that prescriptive land-use policies under the Town and Country Act of 1947 was responsible for the loss of housing affordability.

The Chairman of the Board of Reserve Bank of New Zealand, Arthur Grimes (2007), blames the lack of affordability in Auckland, the nation's largest urban area, on the prescriptive land-use policies. Mr. Grimes stated in the 2025 Taskforce Report in 2009, that per acre prices just inside the Auckland urban growth boundary were 10 times that of comparable land on the other side of the urban growth boundary. In 2005, OECD (Organization for Economic Cooperation and Development) noted the substantial variations in housing affordability between various US cities could be attributed to differences in land-use policies. These policies created less affordability in California, New Jersey, Massachusetts, and New York. The report also notes superior affordability in Texas due to responsive land-use policies.

The examples of Portland, Las Vegas, and Phoenix illustrate the above argument as well. For example, according to Cox (2002) as available land inside the urban growth boundary declined, Portland experienced the largest housing affordability decline among major metropolitan areas during the 1990s. The median multiple (a ratio of median house price divided by median household income) at the peak of the bubble (2007) was 5.4.

The 6th Annual Demographia International Housing Affordability Survey: 2010 rated various metropolitan markets in Australia, Canada, Republic of Ireland, New Zealand, United Kingdom, and United States. The data used was derived from the third quarter of 2009 to determine the affordability measure of median multiple and is depicted in **Table 5**. For example, a median multiple of 3.0 or less is rated as affordable, whereas a median multiple of 5.1 and over is rated as severely unaffordable.

Table 5: Market Affordability Rating Per Median Multiple

Rating	Median Multiple	Number of Markets
Affordable	3.0 or less	103
Moderately Unaffordable	3.1 to 4.0	74
Seriously Unaffordable	4.1 to 5.0	34
Severely Unaffordable	5.1 & over	61
TOTAL		**272**

Source: http://www.demographia.com/db-dhi-econ.pdf

Out of 103 affordable markets, 98 were in the US and 5 were in Canada. This shows an improvement over 2008 where only 87 markets had affordable houses.

The issue of affordability is associated not only with the cost of housing but also with real wage rate decline. According to Gyourko and Linneman (2003) real wages have declined since the mid 1970s for the lower and middle class home owners due to international competition. For example, after 1974 workers with less than a high school education suffered a 21.7% real wage decline, and persons with a high school education had a 14.7% real wage loss. Extending his 30-year study, Gyourko (1998) stated that households headed by a person 36 years and under had experienced a decline in house ownership rates. The issue was the same for the family headed by a female.

Further, the study done by Moore & Skaburskis (2004) found that affordability problems tripled from 4.5% to 13.6% for the period 1982 to 1999 in Canada. The reasons for the lack of affordability are (a) inadequate supply of affordable housing and (b) changes in income due to economic restructuring.

Case and Mayers (1996) studied the Boston metropolitan area from 1982 to 1994 and found that housing prices are related to differences in employment patterns, accessibility to employment and quality of schools in the area. The study analyzed 168 Massachusetts towns in the Boston area and found that housing prices declined in the areas where manufacturing jobs had declined.

During economic downturns, housing affordability becomes an important topic of conversation across the nation. Clearly, federal, state and local regulations affect both the supply and cost of purchasing, as well as owning or renting housing (Joint Center for Housing Studies, 2007; Dacquisto and Rodda (2006).

The generally accepted definition of housing affordability is for a "household to pay no more than 30% of its annual income on housing" (http://www.hud.gov/offices/cpd/affordablehousing/index.cfm). Quigley and Raphael (2004) describe housing affordability in terms of the economic wellbeing of families and individuals. For example, for those in the top income quintiles, affordability is about the terms on which housing can be purchased, as well as the time in which the loans to purchase them can be amortized. However, for lower income households comprised of poor and minority citizens, affordability is about the terms for rental contracts and the relationships between rents and low incomes.

Wardrip's (2011) analysis of housing affordability between 2008 and 2009 shows more than one in four working households (those that work an average of at least 20 hours a week with incomes no higher than 120 percent of the income in their areas) spending more than half of their income in housing costs. These statistics and many others indicate that states and localities need policies that expand the supply of affordable housing (Brennan and Williams, 2011).

It is noted that research associates higher house prices with the implementation and enforcement of stronger land-use regulations (http://www.demographia.com/db-dhi-econ.pdf). Curry (2007), on behalf of the North Carolina Housing Coalition, indicates that those who build affordable housing continue to face land-use regulation opposition from local governments across the state. Curry estimated North Carolina's affordable housing stock at less than 100,000 units, while over 750,000 households live in substandard housing. These results are disturbing, considering the far-reaching, positive economic impact of residential construction on local communities.

Numerous studies have been conducted about the impact of land-use regulations on affordable housing (Demographia, 2012; Casella and Meck, 2009; Gleaser and War, 2008; Knapp, Moore, Meck and Parker, 2008; Curry, 2007; Quigley and Raphael, 2004). Zoning is the most common form of land-use regulation, and it has been so for many years. "Since New York City adopted the first zoning ordinance in 1916, zoning regulations have been adopted by virtually every major urban area in the United States" (Land Use and Zoning Basics, 2011, p.1). In addition to zoning requirements, Curry (2007) listed several factors that may affect affordable housing: design, community opposition or support, state of public services, local government competency and efficiency, financing, local politics, etc. Knaap, Moore, Meck and Parker (2008) found zoning to be an impediment to affordable housing, but they also argued that zoning is an important part of the solution.

Curry's (2007) research indicates that affordable housing developers can overcome municipal barriers by spotting fair housing violations where fair housing laws may be implicated. For example, when there is a lack of evidence to build fair housing, state zoning law could be the only available recourse for appealing an adverse decision. Pendall (2007) describes pro-housing policies as consequences of actions in state legislatures and courts by affordable housing, civil rights, and market-rate housing advocates working to overcome resistance by municipalities in state capitals. This may indicate that acquiescence or support from market-rate home builders is a prerequisite for passage of state-level initiatives by local governments that promote affordable housing actions.

Quigley and Raphael (2004) believe that the extent that cities make it difficult to build new housing can affect the availability of affordable housing. Cities can complicate and add costs to the process of building new housing, and the most extreme barriers come in the form of growth controls like moratoria on new developments or open space requirements. Numerous earlier studies of the effects of land-use regulations that reduce housing supply and increase housing prices include Thorson's (1996 and 1997) analyses that show how local zoning ordinances can reduce the supply of housing by artificially increasing land requirements and by allocating away from residential uses, ultimately resulting in increased housing prices and reduced new housing construction. Pendall's (2007) study indicates that

land-use regulations can make housing more costly and less affordable by restricting supply and demand for housing. The regulations can also raise rents and cause a shift between housing types by raising land prices.

Jud (2009) described how many communities have begun to regulate the pace of housing construction through impact fees and other measures to decrease housing development. These and many other efforts like zoning ordinances and growth control measures (Curry, 2007; Pendall 2007; Quigley and Raphael, 2004; and Glickfeld and Levine, 1992) can affect the success of affordable housing development in a community.

Jud's (2009) analysis of *The Economic Impact of Single-Family Real Estate Development in North Carolina* and the tightly regulated pace of housing construction in the state provides overall estimates of the impact from single-family housing development. For example, he estimates that a typical residential project could generate an average of $23,326,149 per year in output with the initiation of construction through the first 10 years of occupancy. This impact alone could have a tremendous impact on employment and other related economic activities, including a substantial fiscal surplus for local governments.

Modeling Of Regulations

The objective of this portion of Part II is to show the cost of current regulations on housing prices. The first section will show the regulatory cost by using the Demographia Index and the second section will show the cost of regulation of the same cities by using the NAHB/Wells Fargo Housing Market Index model. The third section will provide a brief overview of the 80/20 Rule. The fourth section shows the impact of regulation on affordability by reviewing two (2) recent residential developments, Aberdeen Subdivision, developed by Faison Enterprises, Inc., and Mosaic Village, a mixed-use project, developed by the Griffin Brothers, LLC and Johnson C. Smith University. A discussion of Charlotte's Tree Ordinance and its impact on affordability will conclude the fourth section in this portion of Part II.

The local regulations being reviewed are Charlotte's *Post-Construction Control Ordinance (PCCO)*, the *Tree Ordinance* and the *Urban Street Design Guidelines (USDG)*. The PCCO has been in effect since 2008 and was revised in 2011 to provide more flexibility for administration of the ordinance, as well as to take into account changes to other associated ordinances. The main reasons for its enactment were to remain compliant with State and Federal mandates, protect drinking water supplies, reduce the need for watershed restoration and manage stormwater run-off and any pollution thereof (2013 Charlotte/Mecklenburg Stormwater Services Website).

The USDG is the implementation tool for planning and designing Charlotte's streets. It was adopted in 2007 and the main reasons for the ordinance are to improve safety and neighborhood liveability, as well as promote transportation choices and create long-lasting value (2013 Charlotte/Mecklenburg Department of Transportation Website).

The Tree Ordinance was originally adopted in 1978, revised several times, most recently in 2010. It serves to protect trees in public right-of-ways and those on private property in instances of development, both commercial and multi-family, as well as new residential subdivisions (2013 Charlotte/Mecklenburg Engineering and Property Management Department Website).

Section I: Regulatory Cost Calculations by Using the Demographia Index

This index is calculated by using two assumptions: (1) The expected cost of construction is greater than or equal to 80% of the advertised price of the house and (2) the expected cost of construction is less than 80% of the advertised price of the house. The construction cost data was obtained from R. S. Means.

Assumption I: Expected Construction Cost is 80% or More of Advertised Price of the House:

Suppose that in a given city, the advertised price of the house is $161,000. If it is assumed that the expected cost of construction is 80% or

more of the price of the house, then the expected cost of construction in this city would be 80%*($161,000) = $128,800.

The expected finished land and regulation cost is = 25% of the expected cost of construction. So the expected finished and regulation cost = 25% ($128, 800). This amount is equal to $32,200. The expected finished cost of land and regulation implies the land on which on-site infrastructure is added and is made ready for house building.

The expected raw land and regulation cost is equal to the expected finished land and regulation cost minus the cost of on-site infrastructure. The cost of on-site infrastructure is equal to 50% of expected finished land and regulation cost. The expected raw land and regulation cost = $32, 200 – 50%($32, 200) = $16, 100. This cost is called the "Normal Cost".

The Demographia Index = (Normal Cost + Excess Land & Regulation Cost)/ (Normal Cost). In this case, the excess land and regulation cost is zero because the expected cost of construction is greater than or equal to 80% of the advertised house price. This means that the Demographia Index is one (1) and implies that the city is less regulatory. Cities like Atlanta, Houston, Dallas/Fort Worth, Raleigh/Durham have a Demographia Index of one (1) and they are considered less regulatory. The City of Charlotte is comparable to the cities sited above and therefore is considered less regulatory.

Assumption II: Expected Construction Cost is Less Than 80% of Advertised Price of the House:

Assume that the city has an advertised market price = $ 228,300. The expected cost of constructions from R. S. Means data is = $135,200. The ratio of expected construction to price is less than 80%. So we have to calculate excess land and regulation cost. Excess land and regulation cost = advertised price of the House – 1.25 (expected construction cost). In this example excess land and regulation cost = $228,300 – 1.25($135,200) = $228,300 - $169,000 = $59,300. What will be the normal cost in this example: 25% (expected cost of construction) = .25 ($135,200) = $33,800. The raw land and regulation cost (Normal Cost) = $16,900. The Demographia Index = ($16,900 + $59,300)/$16,900 = 4.509. This market is considered to be more restrictive because the Demographia Index is greater than one (1).

Implications of the Index

The Demographia Index assists us in determining which markets are less restrictive and which markets are more restrictive. It has taken six categories of regulations to determine the degree of regulations. These regulations are: (1) Urban Containment, (2) Large Lot Zoning, (3) Geographic Growth Steering, (4) Moratoria or Limits, (5) High Impact Fees, and (6) Mandatory Regional Planning. **Table 6** shows cities highlighted in

the 2012 Demographia Survey and whether they are "less restrictive" or "restrictive" based on the six categories of regulations.

Table 6: Distribution of Selected Cities by Number of Regulatory Policies

Name of the City	Restrictive Policies by Associated Category	Result
(1) Atlanta	None	Less Restrictive
(2) Dallas/Fort Worth	None	Less Restrictive
(3) Houston	None	Less Restrictive
(4) Raleigh/Durham	None	Less Restrictive
(5) Indianapolis	None	Less Restrictive
(6) St. Louis	None	Less Restrictive
(7) San Diego	1, and 5	Restrictive
(8) Portland	1, 5, and 6	Restrictive
(9) Seattle	1, 5, and 6	Restrictive
(10) Washington/Baltimore	1,3,4, and 5	Restrictive
(11) Minneapolis/St. Paul	1,2,5, and 6	Restrictive

Interpretation of the Demographia Index

Once it is determined that the market is not restrictive or more restrictive by tabulating various policies, then the Demographia Index is calculated. If the Demographia Index value is 2.4 for Minneapolis/St. Paul, then this would indicate that the land and regulation cost is 2.4 times higher than the historical norm. **Table 7** below provides the costs of land and regulation for selected cities where the Demographia Index is computed as NC + AC/NC. Thus the Demographia Index for Charlotte is $17,100 + 0/$17,100 = 1.

Table 7: Cost of Land and Regulations by Demographia Index for Selected Cities

Area	Demographia Index	Normal Cost	Abnormal Cost	Total Cost
Atlanta	1	$16,100	0	$16,100
Dallas /Fort Worth	1	$14,500	0	$14,500
Houston	1	$13,200	0	$13,200
Indianapolis	1	$13,200	0	$13,200
Minneapolis/St Paul	2.44	$20,000	$28,700	$48,700
Portland	4.51	$16,900	$59,300	$76,200
Raleigh/Durham	1	$16,000	0	$16,000
St. Louis	1	$16,900	0	$ 16,900
San Diego	13.21	$18,100	$221,00	$239,100
Seattle	3.84	$18,100	$51,400	$ 69,500
Washington/Baltimore	5.67	$16,000	$74,700	$ 90,700
Charlotte	1	$17,100	0	$ 17,100

Observations:

(1) One of the concerns is that the house advertised price is 10 times the normal cost in the "less restrictive" city. This ratio might have been over stated because Demographia fails to acknowledge that "raw land costs" are not fixed. Irrespective of what regulation or anti- growth restrictions may be in place, "raw land cost " would always be higher in San Diego or Seattle compared to any market in the Midwest or Texas.
(2) Raw land prices reflect the ability of the households in the market to pay for new housing.
(3) The developer cannot control the price of raw land, even if he wanted to because he/she has to meet the market price expectations of the land owners.
(4) Demographia assumes that all variation in housing prices is due to regulations.
(5) If one were to relax the assumption of the Demographia Index of one, then the house price is 10 times the normal cost would not hold.
(6) The Index could better serve the public if the impact of each policy on the home price could have been ascertained.
(7) Applicability would be enhanced if the Index could have divided the impact of regulations on home prices during the development stage and construction phase.

Section II: Regulatory Cost Calculations by Using the NAHB/Wells Fargo Index Model

The regulatory cost statistics in this section are based upon the survey conducted by the National Association of Home Builders (NAHB) and Wells Fargo in April 2011. The survey is known as the NAHB/Wells Fargo Housing Market Index and in April 2011 included a set of special questions that allowed for a view of the cost of regulations embodied in the price of a home. The results of the survey divided the cost of regulation into two parts: (a) regulatory cost during the development phase and (b) regulatory cost in the construction phase. The developmental regulatory cost is divided into three categories: low, average and high. Similarly, the construction cost is also divided into three categories: low, average and high. The average cost is obtained by adding the low and high and dividing by 2. Total cost is the combination of both the above mentioned costs only in the average category but not in the low and high category.

The developmental regulatory cost includes: (a) pure cost of delay, (b) cost of applying for zoning and/or subdivision approval, (c) costs incurred after approval but before construction, (d) the value of land dedicated and/or undeveloped, and (e) impact of changes in developmental standards. The regulatory cost during construction includes: (a) permit, hook up, impact,

and/or other fees paid by the builder and (b) changes in codes or standards over the past 10 years.

Table 8: Total Regulatory Costs in the Final Price of a Home

Regulatory Costs	Low	Average	High
During Development	6.6%	16.4%	26.2%
During Construction	2.0%	8.6%	15.3%
Total Cost	**14.1%**	**25.0%**	**35.9%**

Note: *Total cost in low and high would not be equal to the sum of development cost and construction cost in these categories. This is because costs incurred during the development phase are not perfectly correlated with the costs in the construction phase.* ***Source: Emrath, P., 2011, How Government Regulation Affects the Price of New Homes. Housing Economics.com by NAHB.***

Table 9 below provides an example of the impact of total regulatory costs for selected sites.

Table 9: Regulatory Costs of Selected Cities as a Percentage of Price

Metro Areas	Price of the House	Low Cost 14.1% of Price	Average Cost 25% of Price	High Cost 35.9% of Price
Atlanta	$161,000	$22,701	$40,250	$57,799
Dallas/Fort Worth	$145,100	$20,459	$36,275	$52,091
Houston	$131,600	$18,556	$32,900	$47,244
Indianapolis	$138,700	$19,557	$34,675	$49,793
Minneapolis/St. Paul	$228,800	$32,261	$57,200	$82,139
Portland	$228,300	$32,190	$57,075	$81,960
Raleigh/Durham	$160,200	$22,588	$40,050	$57,512
St Louis	$168,800	$23,801	$42,200	$60,559
San Diego	$402,300	$56,724	$10,575	$14,426
Seattle	$231,100	$32,585	$57,775	$82,965
Washington/Baltimore	$234,900	$33,121	$58,725	$84,329
Charlotte	$171,000	$24,111	$42,750	$61,389

Note: *Cost of each city is obtained by multiplying the price of the house in that city by cost ratio. For example, Atlanta has a price of $161,000. Multiply this by the cost ratio of 14.1% , which equals $22,701 and this is the cost of regulation for Atlanta*.

Comparison of the Regulatory Cost Between the Demographia and NAHB/Wells Fargo Indices

NAHB/Wells Fargo Housing Market Index does not distinguish between less regulated and more regulated cities while Demographia does. It calculates costs based upon development costs and construction costs. Demographia does not utilize this methodology. The NAHB/Wells Fargo Index model gives three cost percentages based upon the survey undertaken, (a) low, (b) average, and (c) high. The Demographia Index provides two categories of costs: (a) normal cost and (b) abnormal costs. The differences in cost are due to differences in the assumptions made in calculations of both indices.

Section III: The 80/20 Rule

The 80/20 Rule is an industry standard used to determine lot price. It includes land price, development costs, profit and overhead costs (based upon a 20% gross margin). This means that if the price of the house is $200,000 then by the 80/20 Rule, the lot price will be $40,000. Stated in a different manner, this means that a house is 5 times the lot price. Under this rule or model, the multiplier used is 5.

Indices, Multipliers and the PCCO and USDG Regulations

Using the example in the above section on the 80/20 Rule, the implementation of PCCO or USDG would increase the price of the house 5 times the PCCO or USDG cost. If the cost of PCCO is $3,000 and the cost of USDG is $4,000 then the increase in house price will be $35,000.

The PCCO costs impact house price through the mechanisms of reducing the number of units, increasing land cost, development cost, additional BMP and additional volume control. The USDG costs impact is realized through the above mentioned costs, as well as costs of additional streets, sidewalks, trees, etc. The "multiplier" of 5 remains constant. It does not increase given an increase in regulations. However, the 80/20 Rule does allow the price to fluctuate in response to a change in regulations.

The NAHB/Wells Fargo Index model uses a "multiplier" of 4 and it also remains constant even when there is an increase in regulations. In contrast, the Demographia Index allows its "multiplier" to fluctuate. In a non- or low-regulatory environment, it is 10 times the normal costs but as regulation increases the "multiplier" also increases. This model also allows the price to fluctuate. Different regulatory policies impact housing prices differently and it is important to utilize the appropriate "multiplier" for each policy. However, none of the models discussed in this study, as well as other tools take into account the difference between varying regulatory policies. The housing industry needs a "dynamic multiplier". Attempts have been made to develop a comprehensive regulatory index but it amalgamates many measures and at best you would get a general overview.

What Factors Influence the Value of the Multiplier?

The first factor that can determine the size of the multiplier is the *regulatory regime*. "Other things being equal", if the *regulatory regime* is stringent, then the cost impact on the price of a house would be more pronounced. It is also implied that the other factors that influence demand and supply of housing will not change. The ultimate change in house price will be determined by the elasticity of supply and demand of housing.

Which Multiplier Should be Utilized?

The choice of a particular multiplier depends upon the local regulatory environment as measured by the regulation index and the speed with which new regulations are being introduced. The NAHB/Wells Fargo Index model

has introduced the multiplier based upon its assumption that the average cost of regulation is 25% of the final price of the home. The multiplier in this case is 4. Local developers have used the multiplier of 5. The study done by John Crosland Jr., in 2009, uses the multiplier of 5 for the City of Charlotte. Demographia also assumes the same multiplier via a flow through mechanism.

Section IV: Impact of Regulations on Housing Affordability

The concept of cost calculation for various regulatory measures involve their impact on housing prices. The cost of regulation depends upon the percentage increase in home prices due to the increase in regulation, percent of additional increase in price that is financed, interest rate assumed, time period involved in financing, and tax and insurance rates assumed. The cost of utility is assumed to be $150 per month but this is not incorporated in the additional cost calculation because it is the same after and before the regulation.

1. Price assumptions: The increase in housing price due to regulation is based upon three models:

   (A) Demographia Model: ΔP = ΔC/.1

Note: Where ΔC is equal to normal cost or cost of raw land and regulation. If the regulation cost increased by $1000, then cost of finished land and regulation increases by $1000 but normal cost increases by $500. The price of house increases by 10 times the normal cost. This means that the price of house increases by 5000 but it is only five times the total cost increases. The multiplier in this case is = 5. Here ΔP = increase in price due to change in regulatory cost.

   (B) NAHB Model: ΔP = ΔC/.25. The multiplier in this case is 4.

   (C) 80/20 Rule Model: ΔP = ΔC/.2. The multiplier in this case is 5.

Note: Here ΔP shows the increase in price due to regulation and ΔC shows increase in cost of regulation.

2. The rate of interest is assumed to be 5% because it is reasonable in the present situation.

3. The time period for financing is assumed as 30 years and tax rate and insurance rate total is = .0155.

4. The median home price prior to additional regulation is assumed to be $171,000 and median income is assumed to be $57,400 per year.
5. The down payment is assumed to be 20%.

Table 10 provides examples of the impact of increased regulation costs on monthly household mortgage payments.

Table 10: Regulation Costs and Their Impact on Monthly Household Mortgage Payments

Cost of Additional Regulation	Per Month Additional Cost (PITI) Based on Demographia Index	Per Month Additional Cost (PITI) Based on NAHB/Wells Fargo Index Model	Per Month Additional Cost (PITI) Based on the 80/20 Rule
1000	27.93	22.85	27.93
2000	55.87	44.69	55.87
3000	83.80	67.03	83.80
4000	111.72	89.37	111.72
5000	139.65	111.72	139.65
6000	167.59	134.07	167.59

PITI = Principle, Interest, Taxes and Insurance

The question is which model to use in estimating the cost of regulation. In this study, the Principle Investigators found the most reasonable model to use was the NAHB/Wells Fargo Index model because the information was generated by a survey of the developers in the particular locality under study. Demographia's normal cost includes both raw land and regulation cost. Since both of these costs are lumped together, it is bound to overstate the cost of increased regulations.

Table 11 depicts the impact of increased regulatory cost on housing affordability per the three (3) index models reviewed in this study and utilizing a "median multiplier".

Table 11: The Impact of Regulatory Cost on Housing Affordability – Using a Median Multiple

Cost of Additional Regulation	Affordability Index Based on Demographia Index	Affordability Index Based on NAHB/Wells Fargo Index Model	Affordability Index Based on 80/20 Rule
1000	3.10	3.04	3.10
2000	3.15	3.12	3.15
3000	3.24	3.19	3.24
4000	3.33	3.26	3.33
5000	3.41	3.33	3.41
6000	3.50	3.40	3.50
Charlotte's Present Index = 2.98			

Charlotte's present Median Multiple Index is 2.98. Therefore, Charlotte's housing, even given the current land-use regulations, is seen as currently "affordable". However, as additional costs keep rising and/or new land-use regulations are adopted, Charlotte would slip from the affordable category to moderately unaffordable. It should be clear from the above

discussion that as the regulatory cost increases, the burden on homeowners and/or renters will also increase and the affordability of homes will decline.

Applicable Local Regulations

As stated earlier, local regulations reviewed under this study include Charlotte's Post-Construction Controls Ordinance (PCCO), the Urban Street Design Guidelines (USDG) and the Tree Ordinance. The following two abbreviated case studies show the impact of these regulations on housing costs, to both the developer and end user.

Case Study #1 - Aberdeen Subdivision

This project is currently under development in the "Steele Creek" area of Charlotte. It was originally designed before the enactment of Charlotte's Post-Construction Control Ordinance (PCCO) and Urban Street Design Guidelines (USDG). Therefore, the following analysis compares the lot yield and development cost under the two ordinances to a scenario in which neither is required. Without the ordinances, the development would have included 105 SF lots, with a mix of 65' and 70' widths. To comply with the new regulations, the site was reconfigured and lot widths shrunk to a maximum of 55' wide. The total number of lots was reduced to 104, a loss of one lot.

Cost Calculation Based on the Demographia Index:

Demographia assumes that the change in the final house price is 10 times the normal cost. However, when the developer is required to incur the regulatory costs, then they are directly adding to the expected costs of finished land and regulations. Fifty percent of these become the normal cost or cost of raw land and regulation. In our example, the costs of PCCO and USDG = $3,059. These costs directly raise the costs of expected costs of finished land and regulations. Normal costs or costs of raw land and regulation = .5 X $3,059 = $1,529.50. The increase in the price of the house due to these regulations is equal to: 10 X $1,529.50 = $15,295. Assuming 5% interest rate, 30 year loan period, .0155 as tax rate and insurance premium, the total additional monthly payment to the house owner = $85.45. Thus the Demographia Index assumes the multiplier value of 5 in an indirect way. **If one fails to recognize the flow through mechanism, then costs due to regulations would be substantially higher.** In this case, the median multiplier would be 3.27 for the City of Charlotte, which results in a decrease in affordability.

Cost Calculation Based on the NAHB/Wells Fargo Index Model (Assume a Multiplier of 4):

Data provided states that prior to PCCO and USDG, the price per lot was $23,149. After the PCCO and USDG regulations, the price of the lot increased to $26,208. The additional cost attributable to these regulations is $3,059 per house. The question is how much increase in the price of the new home would be due to the increased regulation cost? The answer to this

question is based upon calculations using the housing market index model developed by NAHB/Wells Fargo in April 2011.

The NAHB/Wells Fargo Housing Market Index model derives the average multiplier of 4 based upon their April 2011 survey. This would mean that the price of the new home will increase by $12,236 ($ 3,059 X 4). If one pays 20% down and finances 80% of the additional home price at an interest cost of 5% for a 30 year period then the monthly incremental payment would be $52.55. The tax rate and insurance rate combined is =.0155. 12,236 X.0155 = $189.66. Monthly payment is calculated by dividing by 12. Therefore, the insurance and tax burden per month will be $15.80. The total additional monthly payment would be = $52.55 + $15.80 = $68.35.

What impact would these new regulations have on the median multiple for Charlotte? The median house price = $171,000. The median income for Charlotte is $57,000. Thus the new median multiple = ($171,000 + $12,236)/$57,000 = 3.214. The increase in the house price increases the median multiple and decreases affordability.

Cost Calculations Based on the 80/20 Rule (Assume a Multiplier of 5):

Another way to analyze the impact of the data in Case Study #1 is to assume the multiplier of 5. Most of the industry professionals in the Charlotte area assume or utilize a multiplier of 5. The increased regulatory cost by $3,059 will increase the price of the house by $15,295 ($3,059 X 5). Eighty percent of this is financed by the buyer at 5% interest for thirty (30) years. This results in the monthly payment of $65.69. The cost of tax and insurance is = .0155 X $15, 295 = $237.07. The monthly cost is = $19.76. The additional monthly cost the buyer will have to incur due to regulations will be: $65.69 + $19.76 = $85.45. The new median multiple will be: ($171,000 + $15,295)/$57,000 = 3.27, which depicts a decrease in affordability.

Case Study #2 - Mosaic Village

Mosaic Village, completed in 2012 at a total development cost of $26 million, is a mixed-use project consisting of a 299-bed residence hall for Johnson C. Smith University, 7,000 SF of retail space, and a 400-car parking deck. The total impact of regulations on Mosaic Village was $1,015,525. For the purpose of this study, the assumed rate of return is 10% on the additional cost. This is normally the rate of return people expect over the long term from the stock market. Therefore, the additional cost borne by 299 beds will be $101,552.5 ($1,015,525 X 10%). This additional cost will be divided between 299 beds. Each bed will have to pay an additional rent of $339.64 per academic year. This equates to an additional cost of $37.74 per month per student due to the regulations. Presently, students are paying $750 per bed. The regulatory cost will increase their rent to $787.74.

Charlotte Tree Canopy Regulation

There are many advantages one could perceive if the plot has more trees. However, the requirement to have tree canopy is not free. It imposes certain costs. At the present time, Charlotte has a 46% tree canopy but the goal is to have a 50% tree canopy by 2050. The city would need to grow 25,000 trees per year to meet this goal. Currently, 10,000 trees per year are being planted. Therefore, an additional 15,000 trees per year should be planted. The total cost of meeting the goal per year is $625,000. This is based on a per tree cost of $25.00. The table below shows the calculated cost per year for specified Charlotte neighborhoods. The cost was calculated by multiplying the total cost of $625,000 by the acreage in a given neighborhood divided by the total acreage. The number of trees to be grown depends upon the acreage in the area. The cost assignment would depend upon the number of plots per acre. If the number of plots per acre is 7, then the cost per lot would be $65.00 per year for 38 years. If it is assumed that the number of lots per acre is 5, then the cost per lot would be $90.50 per year for 38 years. The regulatory cost that the homeowner is paying now plus this additional cost will make it difficult to afford the home. The benefit of the new regulation might be great but if a person has difficulty paying the existing mortgage then this benefit will be of little value.

Charlotte Neighborhoods Larger Than 25 Acres With Less than 10% of Tree Canopy. The City of Charlotte compiled the following list using aerial photography from 2008, as well as site inspections:

Table 12: Canopy Cost Distribution by Neighborhood in Charlotte

Neighborhood Name	District	Acreage	Tree Canopy	Canopy Cost
First Ward	1	204	8.8%	$92,324
Second Ward	1	148	5.5%	$66,980
Tryon Street Corridor	1	118	9.5%	$53,403
Planters Walk	3	211	6.4%	$95,492
Steele Creek	3	124	7.3%	$56,118
Stowe Creek	3	99	2.4%	$44,804
Brook Hill	3	66	7.1%	$29,869
Greybriar	3	64	9.7%	$26,964
Bennington Place	3	38	4.1%	$17,197
Sinclair Place	4	45	8.3%	$20,365
The Arbors at Mallard Creek	4	37	8.0%	$16,745
Mapleton	4	30	9.5%	$13,577
South Hampton Commons	7	86	3.8%	$38,921
Weston Glen	7	70	9.8%	$31,679
Kingsley	7	41	6.7%	$18,555

Results and Conclusions

The cost of housing increases with increases in regulations. As the Literature Review section in this study depicts there are numerous examples detailing how regulations impact the cost of housing. The amount of increase in cost due to regulations depends upon the models and/or regulation indices and corresponding multiplier used. For purposes of this study, three indices were used to test the assumption and provide cost modeling, Demographia Index, NAHB/Wells Fargo Housing Market Index model and the 80/20 Rule. In addition, to those main indices discussed in the Literature Review and Modeling of Regulations sections, two other indices are of note to the assumption, the *Brookings Institute and NAHB/Wells Fargo Housing Opportunity Index*.

The regulation criteria by the Brookings Institute and Demographia are very similar. However, the Demographia Index is metropolitan area based while the Brookings Institute is county based. For example, an Index of 1 in Demographia is similar to 1.1 and 1.2 in the Brookings Institute Index. Both indices show the less restrictive regulatory environment. Furthermore, a Demographia Index of 2 corresponds to a Brookings Institute Index of 2.2, reflecting a more restrictive environment.

Areas which are less restrictive with respect to land-use regulations are: Atlanta, Dallas, Houston, Indianapolis, Raleigh/Durham, and St. Louis. Areas which are more restrictive are Minneapolis/St. Paul, Portland, San Diego, Seattle, Baltimore, and Washington, DC. Since Atlanta and Raleigh/Durham have index values of 1, it can be concluded that the Charlotte Index value is also 1, which makes Charlotte less restrictive. However, because the median home price in Charlotte/Mecklenburg is $171,000, the cost of excess raw land and regulation cost is $17,100. This cost is higher than the average cost regulation of less restrictive areas, which is $15,100. As the cities become more restrictive, the average cost of regulation increases to $104,800. Therefore, the City of Charlotte should be mindful of the fact that an increase in the growth of regulations could have a direct negative impact on people with less income as it relates to housing. These costs have to be judged against the unemployment rate of Charlotte/Mecklenburg, which was 10.1%. The African American unemployment rate was 20.1% in April 2012 (http://www.demographia.com/db-dhi-econ.pdf).

The problem with the Demographia Index is that it neglects the psychology of the real estate market, which creates booms and bursts. Demographia assumes that the difference between the actual home price and the price derived from the 80/20 Rule is due to regulation alone, and this is not true. Lumping all the different regulations into one category neglects the role and the importance of each factor combined. Another point that must be raised, given the preceding discussion, is that growth management policies are not adopted in isolation. They are adopted as components of

local *regulatory regimes*, defined as the sum of formal and informal institutions that regulate the delivery of housing and community services in a place (1992 Lowery and Ferguson). This point raises an important matter that must be given further study as interested parties in Charlotte/Mecklenburg seek to determine local factors that will aid in keeping housing affordable.

As we continue the original discussion in preceding paragraphs, **Table 13** depicts median multiple affordability rankings of North Carolina's Metropolitan Statistical Areas (MSA). Charlotte's Median Multiple is 2.98, which indicates that Charlotte housing is affordable (Distribution of Markets by using affordability Rating Category of 3 or less).

Table 13: Median Multiple Index of Affordability of Selected NC MSA Third Quarter 2011

NC MSA	Median Multiple	International Ranking of Affordability	National Ranking of Affordability	Median Home Price	Median Income
Asheville	3.8	198	170	163,500	42,600
Charlotte	2.98	113	105	171,000	57,400
Durham	3.4	164	147	166,900	48,500
Fayetteville	2.6	60	57	112,000	43,900
Hickory/Lenoir / Morganton	2.6	60	5.7	103,200	39,800
Greensboro	3.1	129	118	127,300	41,600
Winston Salem	2.8	90	85	120,300	43,100
Raleigh/Cary	3.8	198	170	224,300	58,500

Note: Median multiple of three or less states house is affordable. If median multiple is between 3.1 to 4.0, housing is moderately unaffordable**.**

The median multiple gives a picture that housing is affordable in Charlotte. However, the model should be used with care because it makes those who cannot afford housing invisible. It is important to examine the median multiple in correlation to families with lower income. In **Table 14** this was examined with respect to the City of Charlotte. The question is what would be the affordability for those who are earning 60%, 70%, 80% or 90% of the median income? **Table 14** is presented as if the scenario is based on

the assumption that median income is equal to $57,400 and the house's median price is equal to $171,000. The scenario makes clear that as the percent of median income declines, housing becomes moderately unaffordable to severely unaffordable.

Table 14: Affordability Impact Based on Median Income and Median Multiple

Percent of Median Income	Median Multiple	Comment
60%	4.97	Seriously Unaffordable
70%	4.26	Seriously Unaffordable
80%	3.72	Moderately Unaffordable
90%	3.31	Moderately Unaffordable

Affordability and NAHB – Wells Fargo Housing Opportunity Index (HOI):

The National Home Builders Association has another index that regularly measures affordability. The *NAHB/Wells Fargo Housing Opportunity Index ((HOI)* is defined as "the share of homes sold in that area that would have been affordable for a family earning the median income of that area".

The NAHB/Wells Fargo HOI has two components: income and cost. The "income" part indicates that a family can spend 28% of gross income on housing. One has to divide this amount by 12 to get the monthly share of income spent for housing. The "cost" side includes monthly principal and interest, estimated property tax and insurance for the home. The HOI shows shares of homes affordable with monthly income. For 2012, nationally, 77.5% of the people can afford a home with the median income of $65,000 and the sales price of the home being $162,000. The uniqueness of this index is that it is based upon the actual number of homes sold which people can actually afford. It is also based on the selling price of the homes, thus it reflects market reality. **Table 15** shows the National Association of Home Builders (NAHB)/Wells Fargo Housing Opportunity Index (HOI) for selected metropolitan areas where Charlotte/Gastonia has an HOI of a 79.7 share of homes available for median income levels as compared with a 152 affordability ranking, nationally and 46 for the South, regionally.

Table 15: National Association of Home Builders
Housing Opportunity Index for Selected Metro Areas

Metro Area	HOI 1st Quarter Share of Homes Affordable for Median Income	1st quarter National Affordability Rank	South Regional Affordability Rank
Ashville	70.8	177	66
Charlotte/ Gastonia, NC/ Rock Hill, SC	79.7	152	46
Durham	70.7	187	67
Fayetteville	79.3	156	47
Greensboro/ High Point	83.1	129	35
Raleigh/Cary	84.5	104	24
Winston Salem	88.1	120	10

Regression and the Issue of Limited Observations:

It was expected that NAHB/Wells Fargo HOI and unemployment might be statistically related, with the expected relationship to be negative. This means that the higher the rate of unemployment, the lower the HOI Index. (But the researcher failed to reject the null hypothesis at 5% level of significance).

In the same way, it was anticipated that the share of recovered jobs from the pre-recession peak to employment of 2012 would have a positive impact on the HOI. (However, the researcher again failed to reject the null hypothesis at 5% level of significance). It could be that the strange results are due to the number of MSAs included. The hypothesis should be increased with a larger sample size and other variables like ethnicity, gender and education should be considered.

The Economic Impact of Recession and Issue of Affordability

The median multiple and NAHB/Wells Fargo HOI indices neglect the role of families which are in the lower end of the income distribution. These families are suffering because of the economic recession of 2008. The adverse impacts are due to two reasons:

(a) The decline in employment resulting in a decrease in income. This decline in income made it difficult for families to meet their mortgage obligations resulting in a foreclosure crisis. Many families found themselves moving from homeowners to renters. This increased the demand for rental units.

(b) Due to the recession, the construction of rental units has declined. Thus, the supply of rental units has decreased. The increase in demand and decrease in supply has led to an increase in the price of rental units. For example, according to Bean (2012) between 2007 to 2010 rental prices have increased by 3% while real median income declined by 6%. This economic trend has simply increased the housing cost burden which implies that a household spends more than 30% of area median income on rent and utilities. Nationally in 2007,

45.6% of the households were housing cost burdened; and in 2010, it increased to 48.9%. The Bean Report of 2012 further states that in the South, the percentage of renter-occupied housing units spending 30% or more of their monthly income increased from 44.18% in 2007 to 48.9% in 2010. In the southern region, rural households occupying rental units bore a housing cost burden that increased from 37.56% in 2007 to 42.49% in 2010. This was the highest increase in the nation. Similarly, the number of suburban renters who have to bear the housing cost burden increased from 43.80% in 2007 to 47.51% in 2010, while the central city renters bearing the housing cost burden increased from 47.3% in 2007 to 50.44% in 2010. The cost burden increased by 4.7% between 2007 and 2010 for renters who were under 25 years of age. The renters who were 65 years and over experienced a housing cost burden increase of 1.2% for the period 2007 to 2010.

Affordability and Charlotte MSA:

It is a very common notion that if one works full time s/he will be able to afford the dwelling in which s/he wishes to live. When people identify a particular location before moving there, they assess the salary level and percent of income they have to devote to housing. If the housing is expensive, the prospective employees are reluctant to move. The economic viability demands the opportunity of affordable housing, good schools and the multiple opportunities of employment. **Table 16** is based upon the U.S. Department of Housing and Urban Development's (HUD) calculation of Fair Market Rent by unit size. The sufficient income is based upon the concept that 30% of gross income is spent on housing.

Table 16: 2012 Fair Market Rental Cost Per Unit Size: Charlotte MSA

Unit Size	Efficiency	One Bed Room	Two Bed Rooms	Three Bed Rooms	Four Bed Rooms
Monthly Rent	$657	$713	$791	$997	$1160
Annual Income Sufficient for Affordability	$26,280	$28,520	$31,640	$39,880	$46,400
Hourly Wage Sufficient for Affordability	$12.63	$13.71	$15.21	$19.17	$22.30

Source: http://www.huduser.org

It is important to note that the information contained in **Table16** above does not take into account the configuration of a family, especially the ages and gender of the children living in the unit. After calculating the sufficient wage rate, data from the Bureau of Labor Statistics (May, 2011) was used to describe the employment and wages in the Charlotte MSA. **Table 17** presents the wage level needed to afford various sizes of housing units.

Table 17: Housing Affordability by Unit Size and Mean Wage for Charlotte MSA, 2011

Unit Size	Hourly Wage Sufficient for Affordability	Job Categories With Below Sufficient Mean Wages Earned Per Hour	% of Total Employed	Mean Wages Earned Per Hour	Affordable	% Employed Unable To Afford
Efficiency	12.63	Food preparation and serving related	8.6	10.19	No	
		Building and grounds cleaning and maintenance	2.9	11.11	No	
		Personal care and service	2.5	11.14	No	**14.0**
One BR	13.71	Healthcare support	2.4	12.69	No	**2.4**
Two BR	15.21	Farming, fishing, and forestry	0.1	14.26	No	**.1**
Three BR	19.17	Transportation and material moving	7.9	15.81	No	
		Production	6.2	16.01	No	
		Office and administrative support	16.8	16.59	No	
		Protective service	2.9	17.38	No	
		Construction and extraction	3.3	18.04	No	**37.1**
Four BR	22.30	Sales and related	11.9	19.4	No	
		Community and social services	1.1	19.74	No	
		Installation, maintenance, and repair	3.9	20.64	No	
		Education, training, and library	5.2	21.23	No	**22.1**

Source: **http://www.bls.gov/ro4/oeschar.pdf**

The above table shows that in the Charlotte MSA, 14% of the employed people cannot afford an efficiency dwelling, 2.40% cannot afford one bedroom, .1% cannot afford two bedrooms, 37.1% cannot afford three bedrooms, and 22.1% cannot afford four bedrooms. The analysis clearly notes that the Charlotte MSA has a growing affordability issue. Innovative and strategic efforts should be employed in order to solve this community challenge. Even though by various affordability indices, housing in Charlotte appears to be affordable, the entire analysis does not depict the plight of people who are low or very low income. While Charlotte is not very regulated, the addition of more regulations without taking into account the overall impact on local *housing regimes,* as well as housing supply needs for low income families, will have negative repercussions. Every effort should be made to alleviate the creation of a sizable community of the "invisible poor". The City of Charlotte must find a way to balance the need for development and environmental standards against the increasing housing affordability gap. Indeed a city that cannot provide affordable housing cannot sustain economic vitality.

Economic Impact: Housing Affordability and Development in Charlotte/Mecklenburg

Although Charlotte Chamber's April 2012 economic forecast (Year Ends Strong, Starts Strong) provides evidence of improvement in labor force growth and related economic indicators, concern was expressed about the housing and real estate market backlog of existing homes and new construction. However, the issue of affordability is one that is having a major impact on the overall quality of life for many in Charlotte/Mecklenburg. (http://charmeck.org/city/charlotte/nbs/communitycommerce/CommunityUniversity/Documents/CHASection8.pdf). According to Curry (2007) "Well-built, well-maintained, quality affordable units are needed in every community in our state…." Further, The Charlotte Mecklenburg Housing Partnership (2010) indicates that in Charlotte, approximately 1 in 4 households are unable to afford market-rate housing as the gap between income and housing costs widens. Perhaps an important strategy for responding to these issues is in increased housing development before the housing affordability challenge ultimately results in spillover costs that could have a negative impact on the entire community and threaten Charlotte's future.

In Part I, Jud's (2012) report on the Economic Impact of Housing Development in Charlotte/Mecklenburg County states: "Development of a new single-family, owner-occupied structure is estimated to generate an average of $111,708 per year in additional output (or business revenues) in the county from the initiation of construction through the first 10 years of occupancy." The report also estimates the revenue generation potential of a new multi-family, owner-occupied housing unit at $88,749, and a new multi-family, renter-occupied housing unit at $72,030. Additionally, the report describes estimates of the annual potential fiscal impact of new housing development on local government budgets to include the single-family, owner-occupied impact to be a surplus of $485 per capita ($1,281 annually for each unit), the multi-family, owner-occupied fiscal surplus impact as $2,119 per capita ($3,127 annually per unit), and multi-family, renter-occupied fiscal surplus impact as $32 per capita ($56 annually per unit).

Jud's report also notes that the economic impact estimates are drastically reduced due to the recession that has devastated the building industry since 2007; and says that if the building industry were to reach the 2004 level again, the estimates would increase by a factor of four.

The literature is clear that land-use regulations increase the price of housing everywhere. It is also clear that housing affordability is challenging for a sizable portion of the population in Charlotte/Mecklenburg, not just because of the limited availability of such housing due to the decrease in housing construction but because of income, unemployment, and the lingering effects of the recent recession. In this regard, it is recommended that additional research be conducted to include an analysis of the price and quality of structure of housing that is available to those who are challenged by the housing affordability impact. Such results might be invaluable in

increasing the partnership potential of the public and private sector organizations that are most concerned about the plight of the poor and long-term unemployed. Implementing strategies that increase the availability of affordable housing in Charlotte/Mecklenburg could be the economic stimulus that is needed to continue the "strong start" described by the Charlotte Chamber in April, 2012.

The Principal Investigators recognize that the current economic landscape is improving, and with that improvement comes the need for enhanced community dialogue as it relates to growth, development, affordability and availability of safe and decent housing for all of Charlotte/Mecklenburg's residents. The economic rebound raises additional questions that must be answered in regard to affordable housing, i.e. *how does Charlotte, with less available land to annex, continue to meet the demands of population growth; how does rising home prices and rental rates affect low income families and individuals still struggling with high unemployment and other aspects of the recent recession; and given shrinking federal and state assistance, what innovative incentives and financing tools can the local government employ to assist in filling the "financial gaps" for developers and encourage affordable housing development.* As the Charlotte community continues its journey toward becoming a world class city, these are just a few of the questions that must be addressed.

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BACKGROUND OF THE PRINCIPAL INVESTIGATORS

G. Donald Jud is Professor Emeritus of Finance in the Bryan School of Business and Economics at the University of North Carolina at Greensboro and principal of JUD & ASSOCIATES. He has taught courses in economics, finance, and real estate. Dr. Jud received his Ph.D. from the University of Iowa and MBA and BA degrees from the University of Texas. He is author of over 70 academic articles and three books.

Dr. Jud serves on the editorial boards of the *Journal of Real Estate Finance and Economics* and the *Journal of Real Estate Literature* and is a member of the *Appraisal Journal*'s academic review panel. He is a past editor of the *Journal of Real Estate Research* and continues to serve as a member of its editorial board.

Dr. Jud is a past president of the American Real Estate Society (ARES) and former ARES Director of Publications. He is a research fellow of the Homer Hoyt Advanced Studies Institute, where he is an emeritus member of the Weimer School Faculty and the Board of Directors of the Institute. Dr. Jud's research has appeared in numerous academic and professional journals including the *Appraisal Journal, American Real Estate and Urban Economics Association Journal*, *Journal of Real Estate Finance and Economics*, *Journal of Real Estate Research*, *Journal of Housing Economics*, *Journal of Financial Education, Journal of Real Estate Portfolio Management, Journal of Real Estate Practice and Education, Real Estate Issues, Journal of Property Research, Journal of Financial Economics, Land Economics, and Urban Studies*.

Dr. Jud has been a research consultant to Wachovia Bank, NC Department of Commerce, the Piedmont-Triad Partnership, the National Association of Realtors®, the NC Association of Realtors®, the Greensboro Chamber of Commerce, Downtown Greensboro, Inc., the Greensboro Regional Realtors® Association, the Starmount Company, the Town of Boone, NC, RMIC Corporation, CME Merchant Energy, the NC Biotechnology Center, and the NC Association of Electrical Cooperatives

Dr. N.V. Desai, Ph.D., CPA (Certified Public Accountant) is a Professor of Business Administration & Economics at Johnson C. Smith University. As a former Comptroller of Johnson C. Smith University, Accountant III at Duke Energy, and experienced professional at IBM he brings to the classroom a practical outlook to complex economic issues. Dr. Desai has taught courses in Macro and Micro Economics, Statistics, Mathematical Foundations of Business and Economics. As a CPA, Dr. Desai has taught courses in accounting. He taught economics courses nationally and internationally.

As a former Chair of the Department of Business Administration and Economics, he was instrumental in guiding and successfully bringing to conclusion the department's accreditation by ACBSP. Dr. Desai was twice selected as Salzburg fellow in Salzburg, Austria, Scholar in Residence at New

York University and the Winner of Japanese Peace Foundation Fellowship, and Mellon Foundation Scholarship. Dr. Desai has presented and published papers in Portugal, Spain, India and US. He has been recognized for outstanding paper awards in the United States and Spain. He has taught in India as well as in United States. He has been the academic reviewer of most popular graduate level economics text books. He has been an expert witness in the area of income losses due to premature death or termination. He has served as a consultant with the EEOC in the area of discrimination cases.

Dr. Desai has, to his credit, many elected positions like President of the University Senate, Chair of the Tenure and Promotion Committee, Member of the University Grievance Committee, Member of the Board of Trustees of Johnson C. Smith University, Expert Board Member of Naranlala College of Industrial Management and Computer Science in Navasari, India and Member of the Business Board of Livingstone College, Salisbury, North Carolina. Dr. Desai is multilingual and enjoys reading literature in various languages. He loves to travel and has an abiding interest in encouraging young people to excel.

Dr. Linette Fox is a tenured Assistant Professor of Business Administration and President of the Faculty Senate at Johnson C. Smith University. She has also served as Department Head, and Director of the Banking and Finance Center of Excellence. In addition to teaching, Dr. Fox conducts research in entrepreneurship, diversity management, and community assessment and development. She also designs and conducts training and seminars in personal financial management, human resources development, and entrepreneurship development for private and public/nonprofit organizations, both locally and nationally.

Dr. Fox has a Ph.D. in Management and Organization Development from the Union Institute and University, a Masters in Business Administration, from the University of North Carolina at Greensboro, and a Bachelors degree in Business Education and Accounting from Bennett College in Greensboro, North Carolina. She has also done additional study in Spanish and Mexican Culture at the National Autonomous University in Mexico City, Latin American Studies at the University of North Carolina at Chapel Hill, and Curriculum and Teaching at the University of North Carolina at Greensboro.

Dr. Fox is very active in the community and in her professional organizations, including (but not limited to) the Society for Human Resources Management (SHRM), Professional Organizational Development (POD) Network in Higher Education, United States Association for Small Business and Entrepreneurship (USASBE), Leadership Charlotte (CLASS XIII), HBCU Faculty Development Network, etc.

Sherrill Hampton, J.D., is a former Special Assistant to the President and Director of the Center for Applied Leadership and Community Development at Johnson C. Smith University. She has thirty (30) years experience in local government administration, community economic

development, affordable housing development, grant writing/resource development, and non-profit management. Ms. Hampton has designed and implemented a number of successful community-building, multi-county and regional collaborations throughout the southeast. She has worked with several Native American Tribes in Montana, as well as with Latino groups along the Texas/Mexico border. Sherrill holds a BS degree in Social Science from Claflin College, Orangeburg, South Carolina and a J.D. degree from the University of South Carolina's School of Law, Columbia, South Carolina. Ms. Hampton has also received a number of certifications to enhance her work as a practitioner in the field of community and economic development.

Notes