Union County Schools

POPULATION AND ENROLLMENT FORECASTS, 2009 - 2019

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EXECUTIVE SUMMARY

1.   Union County Schools district's total fertility rates over the life of the forecasts are below replacement levels. (Union County TFR = 1.89 versus replacement level TFR= 2.1)

2.   Most in-migration to the district occurs in the 0-to-14 and 30-to-45 age groups.

3.   The 18-to-24 year old population continues to leave the district, going to college or moving to other urban areas.

4.   The primary factor causing the district's enrollment to grow at a slower rate is the continued and growing rate of out-migration in the 18-to-24 year old age group and the slowing in-migration of younger families.

5.   Changes in year-to-year enrollment (particularly after 2012) largely will be due to smaller cohorts entering and moving through the system in conjunction with larger cohorts leaving the system.

6.   As in-migration of young families continues to slow and smaller grade cohorts enter into the school system, total enrollment will grow at an increasing slower rate, then decline. After 2010 the district's elementary enrollment will begin a slow decline.

7.   As the district continues to have less new home construction the rate and magnitude of existing home sales will become the increasingly dominant factor affecting the amount of population and enrollment change.

8.   Total enrollment is forecasted to increase by 1,941 students, or 5.9%, between 2009-10 and 2014-15. Total enrollment will decline by 392 students, or -1.0%, from 2014-15 to 2019-20.

INTRODUCTION

By demographic principle, distinctions are made between projections and forecasts. A projection extrapolates the past (and present) into the future with little or no attempt to take into account any factors that may impact the extrapolation (e.g., changes in fertility rates, housing patterns or migration patterns) while a forecast results when a projection is modified by reasoning to take into account the aforementioned factors.

To maximize the use of this study as a planning tool, the ultimate goal is not simply to project the past into the future, but rather to assess various factors' impact on the future. The future population and enrollment growth of each school district is influenced by a variety of factors. Not all factors will influence the entire school district at the same level. Some may affect different areas at dissimilar magnitudes and rates causing changes at varying points of time within the same district. Forecaster's judgment based on a thorough and intimate study of the district has been used to modify the demographic trends and factors to more accurately predict likely changes. Therefore, strictly speaking, this study is a forecast, not a projection; and the amount of modification of the demographic trends varies between different areas of the district as well as within the timeframe of the forecast.

The calculation of population forecasts of any type, and particularly for smaller populations such as a school district or its attendance areas, realistic suppositions must be made as to what the future will bring in terms of age specific fertility rates and residents' demographic behavior at certain points of the life course. The demographic

history of the school district and its interplay with the social and economic history of the area is the starting point and basis of most of these suppositions particularly on key factors such as the age structure of the area. The unique nature of each district's and attendance area's demographic composition and rate of change over time must be assessed and understood to be factors throughout the life of the forecast series. Moreover, no two populations, particularly at the school district and attendance area level, have exactly the same demographic characteristics. Consequently, one should not expect the rate and magnitude of each area's population and enrollment changes to be identical.

The manifest purpose of these forecasts is to ascertain the demographic factors that will ultimately influence the enrollment levels in the district's schools. There are of course, other non-demographic factors the affect enrollment levels over time. These factors include, by are not limited to, transfer policies within the district, student transfers to and from neighboring districts, placement of "special programs" within school facilities that may serve students from outside the attendance area, state or federal mandates that dictate the movement of students from one facility to another (No Child Left Behind is an excellent example of the factor), the development of charter schools in the district, the prevalence of home schooling in the area and the dynamics of local private schools.

Unless the district specifically requests the calculation of forecasts that reflect the effects of changes in these non-demographic factors, their influences are held constant for the life of the forecasts. Again, the main function of these forecasts is to determine what impact demographic changes will have on future enrollment. It is quite possible to

calculate special "scenario" forecasts to measure the impact of school policy modifications as well as planned economic and financial changes. However, in this case the results of these population and enrollment forecasts are meant to represent the most likely scenario for changes over the next 10 years in the district and its attendance areas.

The first part of the report will examine the assumptions made in calculating the population forecasts for the Union County Schools district. Since the results of the population forecasts drive the subsequent enrollment forecasts, the assumptions listed in this section are paramount to understanding the area's demographic dynamics. The remainder of the report is an explanation and analysis of the district's population forecasts and how they will affect the district's grade level enrollment forecasts.

DATA

The data used for the forecasts come from a variety of sources. Enrollments by grade and attendance center were provided by the Union County Schools district for school years 2002-2003 to 2009-2010. Birth and death data were obtained from the North Carolina State Department of Health and Human Services for the years 2000 through 2008. The net migration values were calculated using Internal Revenue Service migration reports for the years 2000 through 2008. The data used for the calculation of migration models came from the United States Bureau of the Census, 1995 to 2000, and the models were assigned using an economic-demographic system. The base age-sex population counts used are from the results of the 2000 Census.

Due to the methodological problems the Census Bureau is experiencing with their estimates derived from data using the American Community Survey, (particularly in areas with less that 60,000 population) the results of the ACS are not used in these forecasts. Given the sampling framework used by the Census Bureau, only 1,850 of the over 74,000 current households in the district would have been included. For comparison, 8,000 households in the district were included in the sample for the long form questionnaire in the 2000 Census.

To develop the population forecast models, past migration patterns, current age specific fertility patterns, the magnitude and dynamics of the gross migration, the age specific mortality trends, the distribution of the population by age and sex, the rate and type of existing housing unit sales, and future housing unit construction are considered to be primary variables. In addition, the change in household size relative to the age structure of the forecast area was addressed. While there was a substantial drop in the average household size in Union County as well as most other areas of the state during the previous 20 years, the rate of this decline has been forecasted to slow over the next ten years.

ASSUMPTIONS

For these forecasts, the mortality probabilities are held constant at the levels calculated for the year 2000. While the number of deaths in an area is impacted by and will change given the proportion of the local population over age 65, in the absence of an extraordinary event such as a natural disaster or a breakthrough in the treatment of heart disease, death rates rarely move rapidly in any direction, particularly at the school

district or attendance area level. Thus, significant changes are not foreseen in district's mortality rates between now and the year 2019. Any increases forecasted in the number of deaths will be due primarily to the general ageing of the district's population and specifically to the increase in the number of residents aged 65 and older.

Similarly, fertility rates are assumed to stay fairly constant for the life of the forecasts. Like mortality rates, age specific fertility rates rarely change quickly or dramatically, particularly in small areas. Even with the recently reported rise in the fertility rates of the United States, overall fertility rates have stayed within a 10% range for most of the last 40 years. In fact the vast majority of year to year change in an area's number of births is due to changes in the number of women in child bearing ages (particularly ages 20-29) rather than any fluctuation in an area's fertility rate.

The total fertility rate (TFR), the average number of births a woman will have in her lifetime, is estimated to be 1.89 for the total district for the ten years of the population forecasts. The age specific fertility rates are also held constant for all areas for the life of the projection. A TFR of 2.1 births per woman is considered to be the theoretical "replacement level" of fertility necessary for a population to remain constant in the absence of in-migration. Therefore, over the course of the forecast period, fertility will not be sufficient, in the absence of migration, to maintain the current level of population within the Union County Schools district.

A close examination of data for the school district has shown the age specific pattern of net migration will be nearly constant throughout the life of the forecasts. While the number of in and out migrants has changed in past years for the Union County Schools district (and will change again over the next 10 years), the basic age

pattern of the migrants has stayed nearly the same over the last 30 years. Based on the analysis of data it is safe to assume this age specific migration trend will remain unchanged into the future. This pattern of migration shows most of the local out-migration occurring in the 18-to-24 year old age group, as young adults leave the area to go to college or move to other urban areas. The second group of out-migrants is those householders aged 65 and older who are downsizing and moving to smaller homes (particularly from the eastern half of the district). Most of the local in-migration occurs in the 0-to-10 and 25-to-40 age groups, primarily consisting of younger adults and their children.

As Union County is not currently contemplating any drastic changes to their inherent structures, the forecasts also assume the current economic, political, transportation and public works infrastructure (with a few notable exceptions), social, and environmental factors of the school district and its attendance areas will remain the same through the year 2019.

Below is a list of assumptions and issues that are specific to Union County and the Union County Schools district. These issues have been used to modify the population forecast models to more accurately predict the impact of these factors on each area's population change. Specifically, the forecasts for the Union County Schools district assume that throughout the study period:

a. There will be no short term economic recovery in the next 18 months and the national, state or regional economy does not go into deep recession at anytime during the 10 years of the forecasts; (Deep recession is defined as four consecutive quarters where the GDP contracts greater than 1% per quarter)

b. Interest rates have reached an historic low, and will not fluctuate more than one percentage point in the short term; the interest rate for a 30 year fixed home mortgage stays below 7%;

c. The rate of mortgage approval stays at 1999-2002 levels and lenders do not return to "sub prime" mortgage practices.

d. There are no additional restrictions placed on home mortgages lenders or additional bankruptcies of major credit providers.

e. The rate of housing foreclosures does not exceed 125% of the 2005-2007 average of Union County for any year in the forecasts.

f. All currently platted and approved housing developments are built out and completed by 2017. All housing units constructed are occupied by 2019.

g. The unemployment rates for the Charlotte Metropolitan Area will remain below 8.5% for the 10 years of the forecasts.

h. The rate of students transferring into and out of schools within the district will remain at the 2005-06 to 2007-08 average.

i. The inflation rate for gasoline will stay below 5% per year for the 10 years of the forecasts.

j. There will be no building moratorium within the district;

k. Businesses within the district and the Charlotte Metropolitan Area will remain viable;

l. The number of existing home sales in the district that are a results of "distress sales" (homes worth less than the current mortgage value) will not exceed 20% of total homes sales in the district for any given year.

m. Housing turnover rates (sale of existing homes in the district) will remain at their current levels. The majority of existing home sales are made by home owners over the age of 55;

n. The recent decline in new home construction has ended and building rates has stabilized.

o. Private school and home school attendance rates will remain constant;

p. The rate of foreclosure for commercial property remains at the 2004-2007 average for the Charlotte Metropolitan area.

q. The US 74 By-pass around Monroe will not be completed until after 2015

If a major employer in the district or in the Charlotte Metropolitan Area closes, reduces or expands its operations, the population forecasts would need to be adjusted to reflect the changes brought about by the change in economic and employment conditions. The same holds true for any type of natural disaster, major change in the local infrastructure (e.g., highway construction, water and sewer expansion, changes in zoning regulations etc.), a further economic downturn, any additional weakness in the housing market or any instance or situation that causes rapid and dramatic population changes that could not be foreseen at the time that the forecasts were calculated.

The high proportion of high school graduates from the Union County Schools district that continue on to college or move to urban areas outside of the district for employment is a significant demographic factor. Their departure is a major reason for the extremely high out-migration in the 18-to-24 age group and was taken into account when calculating these forecasts. The out-migration of graduating high school seniors

is expected to continue over the period of the forecasts, and the rate of out-migration has been forecasted to remain the same over the life of the forecast series. Given that the district will have progressively larger graduation classes over the next 10 years, (the class of 2019 for example, should be approximately 44% larger than the class of 2009) the number of out migrants from the district will increase.

Finally, all demographic trends (i.e., births, deaths, and migration) are assumed to be linear in nature and annualized over the forecast period. For example, if 1,000 births are forecasted for a 5-year period, an equal number, or proportion of the births are assumed to occur every year, 200 per year. Actual year-to-year variations do and will occur, but overall year to year trends are expected to be constant.

METHODOLOGY

The population forecasts presented in this report are the result of using the Cohort-Component Method of population forecasting (Siegel, and Swanson, 2004: 561-601) (Smith et. al. 2004). As stated in the **INTRODUCTION**, the difference between a projection and a forecast is in the use of explicit judgment based upon the unique features of the area under study. Strictly speaking, a cohort-component projection refers to the future population that would result if a mathematical extrapolation of historical trends were applied to the components of change (i.e., births, deaths, and migration). Conversely, a cohort-component forecast refers to the future population that is expected because of a studied and purposeful selection of the components of change believed to be critical factors of influence in each specific area.

Five sets of data are required to generate population and enrollment forecasts. These five data sets are:

a. a base-year population (here, the 2000 Census population for the Union County Schools district and the attendance areas);

b. a set of age-specific fertility rates for each attendance area to be used over the forecast period;

c. a set of age-specific survival (mortality) rates for each attendance area;

d. a set of age-specific migration rates for each attendance area; and

e. the historical enrollment figures by grade.

The most significant and difficult aspect of producing enrollment forecasts is the generation of the population forecasts in which the school age population (and enrollment) is embedded. In turn, the most difficult aspect of generating the population forecasts is found in deriving the rates of change in fertility, mortality, and migration. From the standpoint of demographic analysis, the Union County Schools district and its twenty nine elementary attendance center districts are classified as "small area" populations (as compared to the population of the state of North Carolina or to that of the United States). Small area population forecasts are more difficult to calculate because local variations in fertility, mortality, and migration may be more irregular than those at the state or national scale. Especially challenging to project are migration rates for local areas, because changes in the area's socioeconomic characteristics can quickly change from past and current patterns (Peters and Larkin, 2002.)

The population forecasts for the Union County Schools district were calculated using a cohort-component method with the populations divided into male and female groups by five-year age cohorts that range from 0-to-4 years of age to 85 years of age and older (85+). Age- and sex-specific fertility, mortality, and migration models were constructed to specifically reflect the demographic characteristics of the school district's attendance center districts and the total school district.

The enrollment forecasts were calculated using a modified average survivorship method. Average survivor rates (i.e., the proportion of students who progress from one grade level to the next given the average amount of net migration for that grade level) over the previous five years of year-to-year enrollment data were calculated for grades two through twelve.

The survivorship rates were modified, or adjusted, to reflect the average rate of forecasted in and out migration of 5-to-9, 10-to-14 and 15-to-17 year olds cohorts to each of the attendance centers in Union for the period 2000 to 2005. These survivorship rates then were adjusted to reflect the forecasted changes in age-specific migration the district should experience over the next five years. These modified survivorship rates were used to project the enrollment of grades 2 through 12 for the period 2005 to 2010. The survivorship rates were adjusted again for the period 2010 to 2015 to reflect the predicted changes in the amount of age-specific migration in the districts for the period.

The forecasted enrollments for kindergarten and first grade are derived from the 5-to-9 year old population of the age-sex population forecast at the elementary attendance center district level. This procedure allows the changes in the incoming

grade sizes to be factors of forecasted population change and not an extrapolation of previous class sizes. Given the potentially large amount of variation in Kindergarten enrollment due to parental choice, changes in the state's minimum age requirement, and differing district policies on allowing children to start Kindergarten early, first grade enrollment is deemed to be a more accurate and reliable starting point for the forecasts. (McKibben, 1996) The level of the accuracy for both the population and enrollment forecasts at the school district level is estimated to be $\pm$2.0% for the life of the forecasts.

RESULTS AND ANALYSIS OF THE POPULATION FORECASTS

From 2005 to 2015, the populations of the Union County Schools district, the state of North Carolina, and the United States are forecasted to change as follows; the Union County Schools district will increase by 30.9%, North Carolina will increase by 14.7%; and the United States increase by 10.8% (see Table 1).

Table 1: Forecasted Population Change, 2005 to 2015

	2005	**2010**	**2015**	**10-Year Change**
U.S. (in millions)	296	312	328	10.8%
North Carolina	8,679,000	9,261,000	9,953,000	14.7%
Union County Schools	152,820	186,470	200,040	30.9%

A number of general demographic factors will influence the growth rate of the Union County Schools district during this period, and include the following:

a. The Baby Boom generation will have passed through prime childbearing ages by 2003, thereby reducing the overall proportion of the population at risk of having children;

b. The remaining population in childbearing ages (women ages 15-45) will have fewer children;

c. The 18-to-24 year old population, in prime childbearing ages, will continue to leave the area to go to college or to other urban areas, with the magnitude of this out-migration flow slowly increasing; and,

d. The district will experience continued increase in housing stock, with an average of 600 new units being built each year through 2012. New housing construction will continue after that point, but housing starts will only average 300 per year until 2019.

The Union County Schools district will continue to experience significant in-migration (movement of new young families into the district) over the next 10 years. However, the size and age structure of the pool of potential in-migrants will change and the effects of the in-migration of families on population growth will be greatly offset by the continued steady growing out-migration of young adults as graduating seniors continue to leave the district.

From 2005 to 2010, the Union County Schools district population is forecasted to increase by 33,650, or 22.0%, to 186,470. From 2010 to 2015, the population is forecasted to continue to increase by an additional 13,570 persons or 7.3%. During the ten years of the forecasts, all of the twenty nine elementary attendance areas are forecasted to increase in population with the growth rates ranging from 4.0% in the Marshville area to 110.0% in the Sun Valley area (See Table 2 for population forecast results of each elementary attendance area). However it is important to note that the vast majority of attendance areas will experience some level of decline in their population growth rates after 2010.

While all elementary areas will see some amount of gross in-migration, (primarily in the 0-to-10 and 25-to-40 age groups,) all areas also will continue to see gross out-migration. This out-migration primarily will be young adults, 18-to-24 years old, as graduating seniors continue to leave the district to go to college or seek employment in larger urban areas. Consequently, all of the attendance areas will experience a modest reduction in their average household size.

Table 2: Forecasted Elementary Area Population Change, 2005 to 2015

	2005	2010	2005-2010 Change	2015	2010-2015 Change	2005-2015 Change
Antioch	4,150	5,640	26.4%	6,020	6.7%	45.1%
East	6,110	6,670	8.4%	7,100	6.4%	16.2%
Fairview	6,720	7,000	4.0%	7,120	1.7%	6.0%
Hemby Bridge	4,630	6,110	24.2%	6,810	11.5%	47.1%
Indian Trail	7,660	8,980	14.7%	9,570	6.6%	24.9%
Kensington	2,140	3,660	41.5%	4,340	18.6%	102.8%
Marshville	6,050	6,210	2.6%	6,290	1.3%	4.0%
Marvin	2,560	4,130	38.0%	4,670	13.1%	82.4%
New Salem	3,390	3,710	8.6%	3,970	7.0%	17.1%
New Town	3,440	5,540	37.9%	6,460	16.6%	87.8%
Poplin	4,280	5,590	23.4%	6,050	8.2%	41.4%
Porter Ridge	5,360	6,510	17.7%	7,050	8.3%	31.5%
Prospect	6,790	7,020	3.3%	7,250	3.3%	6.8%
Rea View	3,630	4,850	25.2%	5,290	9.1%	45.7%
Rock Rest	7,720	8,680	11.1%	9,390	8.2%	21.6%
Rocky River	7,750	9,070	14.6%	9,620	6.1%	24.1%
Sandy Ridge	3,430	5,870	41.6%	6,610	12.6%	92.7%
Sardis	3,700	4,930	24.9%	5,440	10.3%	47.0%
Shiloh	3,430	4,560	24.8%	5,060	11.0%	47.5%
Stallings	4,630	5,800	20.2%	6,220	7.2%	34.3%
Sun Valley	2,790	5,270	47.1%	5,860	11.2%	110.0%
Union	5,250	5,550	5.4%	5,790	4.3%	10.3%
Unionville	7,720	8,860	12.9%	9,250	4.4%	19.8%
Walter Bickett	9,570	10,060	4.9%	10,470	4.1%	9.4%
Waxhaw	7,280	8,450	13.8%	8,820	4.4%	21.2%
Weddington	5,900	7,170	17.7%	7,620	6.3%	29.2%
Wesley Chapel	4,100	5,940	31.0%	6,650	12.0%	62.2%
Western Union	5,420	6,310	14.1%	6,580	4.3%	21.4%
Wingate	7,230	8,330	13.2%	8,670	4.1%	19.9%
Total	**152,820**	**186,470**	18.0%	**200,040**	7.3%	30.9%

As stated in the **ASSUMPTIONS** and emphasized above, the impact of the high proportion of high school graduates that leave the district to continue on to college or to seek employment in large urban areas is significant to the size and structure of the future population of the district. Usually between 60 and 70% of all births occur to

women between the ages of 20 and 29 (considered to be prime childbearing ages). As the graduating seniors continue leave the district, the number of women at risk of childbirth during the next decade declines. Consequently, even though the district's fertility rate is just slightly below replacement level, the small number of women living in the district that are in prime child bearing ages will keep the number of births declining at a modest rate despite the district having a growing population (see the population pyramids in the appendix of this report for a graphic representation of the age distributions of the district and all of the attendance areas). This will require the district to become quite dependant on the in-migration of children just to maintain current grade cohort sizes, let alone experience total enrollment growth rates similar to those experienced by the district over the last 10 years.

As a general rule of thumb, for every two seniors that leave the district, one new household must move into the district to replace the young adults that have left and to replace their lost potential fertility. Over the course of the forecast period, the average number of graduating seniors will be approximately 2,750 per year and at least 75% of them will move out of the district within three years of graduation. Using the general rule, approximately 1,030 new families will be required to move into the district every year or 10,300 new families for the ten-year study period to replace the graduating seniors and their lost fertility. It is forecasted that the impact of the steadily increasing out-migration of young adults will continue to be mostly, (but not completely) offset by young family (25-40 year old householders) in-migration and that the total number of births will be remain fairly constant throughout the forecast period.

Table 3: Household Characteristics by Elementary Districts, 2000 Census

	HH w/ Pop Under 18	% HH w/ Pop Under 18	Total Households	Household Population	Persons Per Household
Antioch	424	45.1%	940	2,800	2.98
East	758	40.2%	1,886	5,435	2.88
Fairview	984	44.6%	2,207	6,267	2.84
Hemby Bridge	416	40.9%	1,016	2,736	2.69
Indian Trail	1,087	43.9%	2,478	6,647	2.68
Kensington	134	36.2%	370	970	2.62
Marshville	819	37.6%	2,178	5,781	2.65
Marvin	209	50.5%	414	1,277	3.08
New ES L	566	46.7%	1,212	3,397	2.80
New Salem	452	39.7%	1,138	3,066	2.69
New Town	231	46.6%	496	1,462	2.95
Porter Ridge	659	38.9%	1,695	4,501	2.66
Prospect	961	40.9%	2,351	6,487	2.76
Rea View	450	75.3%	598	2,115	3.54
Rock Rest	950	46.6%	2,039	6,682	3.28
Rocky River	961	38.1%	2,520	6,470	2.57
Sandy Ridge	149	45.2%	330	968	2.93
Sardis	479	49.3%	971	2,674	2.75
Shiloh	474	55.2%	859	2,541	2.96
Stallings	536	40.8%	1,313	3,610	2.75
Sun Valley	129	55.4%	233	691	2.97
Union	734	41.3%	1,779	4,961	2.79
Unionville	1,066	44.5%	2,393	6,780	2.83
Walter Bickett	1,192	35.7%	3,335	8,909	2.67
Waxhaw	973	42.4%	2,294	6,510	2.84
Weddington	860	55.4%	1,552	4,905	3.16
Wesley Chapel	467	46.8%	997	2,915	2.92
Western Union	695	41.7%	1,668	4,654	2.79
Wingate	850	39.9%	2,128	5,800	2.73
Total	**18,665**	**43.0%**	**43,390**	**122,011**	**2.81**

Another factor that needs to be considered is the birth dynamics of the last 20 years. An examination of national birth trends shows there was a large "Baby Boomlet" born between 1980 and 1995. This Boomlet was nearly as large as the Baby Boom of

the 1950s and 1960s. However, unlike the Baby Boom, the Boomlet was a regional and not a national phenomenon (McKibben, et. al. 1999). Because North Carolina experienced only a modest Baby Boomlet, most of the expected enrollment growth will have to result from in-migration and not from an increase in the grade cohort size.

Clearly, the dominant factor that has affected the population growth rates of the district over the last 20 years has been the number, pace and cost of new homes constructed. However, the dynamics of this in migration flow are more complex than many realize. There is a common misconception that any changes in the economy, housing market or the local transportation systems will an immediate impact of the dynamics of an area's population and the total impact of these changes will be experienced immediately. For example, the Union County Schools district had been experiencing and averaging 5,000 new homes constructed per year from 2000 to 2006. From 2007 to 2009 the area has been averaging about 1,700 new homes per year.

This "delayed demographic reaction" is a key issue when attempting to ascertain the impact and duration of a trend. While it is true that the households moving into these new housing units bring many school age (particularly elementary) children into the district, they also bring many preschool age children as well. Consequently, the full impact of the growth in new home construction is not seen immediately in elementary enrollment as it takes three to seven years for all of the children to age into the schools. This is a key issue since the number of births in the district is insufficient to maintain current enrollment levels. The number of women living in the county ages 20-29 (prime child bearing ages) is too small to produce birth cohorts that are the same size as those currently in the elementary grades.

Table 4: Householder Characteristics by Elementary Districts, 2000 Census

	Percentage of Householders aged 35-54	Percentage of Householders aged 65+	Percentage of Householders Who Own Homes
Antioch	58.9%	13.3%	88.1%
East	37.5%	22.0%	35.8%
Fairview	50.2%	14.8%	88.9%
Hemby Bridge	53.0%	11.8%	87.3%
Indian Trail	47.6%	13.5%	86.3%
Kensington	50.3%	13.5%	89.2%
Marshville	42.7%	22.1%	78.9%
Marvin	63.3%	11.6%	94.7%
New Salem	43.8%	20.1%	85.0%
New Town	57.1%	10.5%	93.1%
Poplin	48.8%	10.7%	95.4%
Porter Ridge	40.9%	15.6%	82.4%
Prospect	44.5%	18.5%	87.7%
Rea View	67.6%	3.0%	99.2%
Rock Rest	41.4%	15.3%	61.7%
Rocky River	40.7%	13.8%	77.8%
Sandy Ridge	64.8%	11.5%	94.2%
Sardis	41.3%	6.5%	93.7%
Shiloh	52.5%	8.7%	89.6%
Stallings	47.9%	14.2%	90.0%
Sun Valley	39.9%	5.2%	79.0%
Union	45.3%	19.7%	86.4%
Unionville	47.0%	16.5%	83.4%
Walter Bickett	37.2%	22.1%	57.7%
Waxhaw	48.9%	19.7%	85.0%
Weddington	63.7%	8.7%	93.6%
Wesley Chapel	61.1%	10.9%	93.8%
Western Union	49.1%	16.5%	87.1%
Wingate	38.7%	16.6%	72.7%
Total	46.5%	15.8%	80.5%

Of additional concern are the issues of the district's aging population and the

growing number of "empty nest" households, particularly in the Sandy Ridge and Rea

View attendance area. For example, after the last school age child leaves high school,

the household becomes an "empty nest" and most likely will not send any more children to the school system. In most cases, it takes 20 to 30 years before all original (or first time) occupants of a housing area move out and are replaced by new, young families with children. This principle also applies to children leaving elementary school and moving on the middle school. Households can still have school age children in the district's school, but also in effect be "empty nest" of elementary age children.

Note as well the steady increase in the median age of the population in the district and all of its attendance areas (see population forecasts in the appendix for the median age of each attendance area for each forecast year). The Union County Schools district as a whole will see the median age of its population increase form 33.4 in 2005 to 38.2 in 2020. This rise in median age is due to two factors, 18-24 year olds leaving the district and a high proportion of their parents staying in their existing households.

As a result of the "empty nest" syndrome, the attendance areas in the Union County Schools district will see a steady rise in the median age of their populations, even while the district as a whole continues to attract some new young families. It should be noted that many of these "childless" households are single persons and/or elderly. Consequently, even if many of these housing units "turnover" and attract households of similar characteristics, they will add little to the number of school age children in the district. Furthermore, many of the empty nest households will "down size" to smaller households within the district. In these cases new housing units may be built in an area, yet there is no corresponding increase in school enrollment.

Table 5: Single Person Households and Single Person Households over age 65 by Elementary Districts, 2000 Census

	Percentage of Single Person Households	Percentage of Single Person Households that are 65+
Antioch	9.6%	33.3%
East	27.4%	42.4%
Fairview	14.2%	37.4%
Hemby Bridge	16.2%	26.1%
Indian Trail	18.2%	28.8%
Kensington	17.8%	19.7%
Marshville	21.9%	43.6%
Marvin	8.7%	38.9%
New Salem	18.3%	48.6%
New Town	10.3%	25.5%
Poplin	14.9%	24.9%
Porter Ridge	15.9%	28.6%
Prospect	16.5%	43.7%
Rea View	3.3%	10.0%
Rock Rest	15.4%	39.0%
Rocky River	22.1%	25.2%
Sandy Ridge	9.7%	43.8%
Sardis	16.3%	13.9%
Shiloh	12.0%	19.4%
Stallings	12.8%	29.2%
Sun Valley	9.0%	19.0%
Union	17.7%	43.6%
Unionville	15.1%	39.1%
Walter Bickett	26.4%	39.4%
Waxhaw	14.6%	42.1%
Weddington	8.5%	27.3%
Wesley Chapel	9.5%	26.3%
Western Union	15.8%	37.1%
Wingate	18.6%	40.3%
Total	17.0%	35.8%

There are several additional factors that are responsible for the difference between growth in population and growth in housing stock. Included among these factors are: people building new "move up" homes in the same area or district, (an

important point since the children in move up homes tend to be of middle or high school age); children moving out of their parents homes and establishing residence in the same area; the increase in single-individual households; and divorce, with both parents remaining in the same area.

RESULTS AND ANALYSIS OF ENROLLMENT FORECASTS

Elementary Enrollment

The total elementary enrollment of the district is forecasted to decrease from 18,766 in 2009 to 17,871 in 2014, a decline of 895 students or -4.8%. From 2014 to 2019, elementary enrollment is expected to decline by 1,008 students to 16,863. This would represent a -5.6% decrease over the five-year period. Twenty seven of the 29 traditional elementary schools will experience a net decline in enrollment over the next ten years, while Antioch and Rock Rest will see modest enrollment increases

However, examining the amount of enrollment change over the 10 year period tends to mask a significant amount of variation in the enrollment trends during this time span. From 2009 to 2014, eight elementary schools will see an increase in student populations. After 2014 this trend disappears as 27 of the 29 elementary schools show a net decline in students for the period 2014 to 2019.

Table 6: Total Elementary Enrollment, 2009, 2014, 2019

|	2009	2014	2009-2014 Change	2019	2014-2019 Change	2009-2019 Change
Antioch	786	844	7.4%	801	-5.1%	1.9%
Benton Heights	682	695	1.9%	698	0.4%	2.3%
East	431	427	-0.9%	409	-4.2%	-5.1%
Fairview	564	476	-15.6%	473	-0.6%	-16.1%
Hemby Bridge	522	492	-5.7%	469	-4.7%	-10.2%
Indian Trail	693	634	-8.5%	612	-3.5%	-11.7%
Kensington	719	715	-0.6%	627	-12.3%	-12.8%
Marshville	496	467	-5.8%	431	-7.7%	-13.1%
Marvin	615	627	2.0%	574	-8.5%	-6.7%
New Salem	331	316	-4.5%	304	-3.8%	-8.2%
New Towm	924	830	-10.2%	759	-8.6%	-17.9%
Poplin	664	720	8.4%	650	-9.7%	-2.1%
Porter Ridge	639	590	-7.7%	539	-8.6%	-15.6%
Prospect	524	438	-16.4%	425	-3.0%	-18.9%
Rea View	832	776	-6.7%	710	-8.5%	-14.7%
Rock Rest	495	544	9.9%	500	-8.1%	1.0%
Rocky River	867	830	-4.3%	801	-3.5%	-7.6%
Sandy Ridge	858	724	-15.6%	650	-10.2%	-24.2%
Sardis	545	521	-4.4%	480	-7.9%	-11.9%
Shiloh	639	564	-11.7%	544	-3.5%	-14.9%
Stallings	619	576	-6.9%	551	-4.3%	-11.0%
Sun Valley	624	592	-5.1%	564	-4.7%	-9.6%
Union	416	368	-11.5%	369	0.3%	-11.3%
Unionville	723	620	-14.2%	605	-2.4%	-16.3%
Walter Bickett	649	622	-4.2%	603	-3.1%	-7.1%
Waxhaw	658	667	1.4%	627	-6.0%	-4.7%
Weddington	661	676	2.3%	640	-5.3%	-3.2%
Wesley Chapel	530	554	4.5%	511	-7.8%	-3.6%
Western Union	448	406	-9.4%	392	-3.4%	-12.5%
Wingate	591	557	-5.8%	542	-2.7%	-8.3%
Total	**18,766**	**17,871**	*-4.8%*	**16,863**	*-5.6%*	***-10.1%***

The reason for this dramatic turnaround in elementary enrollment pattern (and a marked departure from the elementary trends the district has been experiencing over the last 15 years) is the convergence of the effects of three factors, all occurring roughly in 2010. These factors are the equalization of cohort sizes in the elementary grades,

the number of housing units turning over and the slowing of the rise in the number of empty nest households. Each of these factors will contribute in part to the growth in elementary enrollment until 2010 and subsequent decline afterwards.

Over the last several years, one of the main reason elementary enrollment was increasing at a rapid pace was due to the fact that the number of children entering Kindergarten and 1st grade was much larger than the number leaving elementary school after completing 5th grade. After 2009, the number of students in 5th grade will be over 3,150 each year for the next 10 years as opposed to the 2,660 average the district experienced over the last five years. Thus even if the rate of population growth continued at the same pace as the 2000-2006 period, the rate of elementary enrollment growth would have slowed down as the number of students leaving grade 5 increases each year.

The second factor is the slow down in the housing construction industry. While it is true that the Union County Metropolitan Area housing market has done somewhat better than the national trends the last 2 years, it has not been immune the effects of a tightening of the mortgage market and in increasingly restrictive lending practices. Union County, like most areas of the country, saw the number of new home sales jump significantly in 2002 to 2006 as the expansion of sub-prime mortgage practices allowed many people to purchase new homes. Given the turmoil the collapse of the sub prime market has caused, it can be assumed that there will not be a return to these lending practices anytime in the near future.

Graph 1: Annual New Homes Constructed, Union County, NC 2000-2009
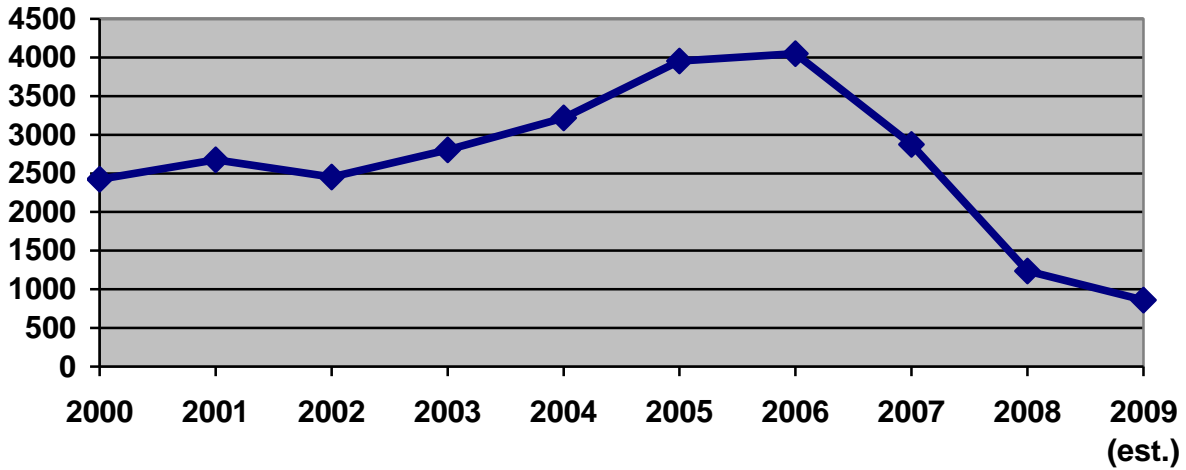
Consequently, the school district (like most suburban areas in the country) will see the number of new homes sales drop back to the levels experienced before the sub prime boom. This trend was already evident in 2007, 2008 and 2009 (See Graph 1). Further, these forecasts assume that there will not be a significant increase in the number of foreclosed housing units being put on the market in the immediate future.

The third factor is the rise of the number of empty nest households in the district. In 2000 the school district had 46.5% of their households headed by people ages 35-54 (The ages most people have school aged children). The district's proportion of households in these age groups has dropped dramatically over the last eight years as people aged and the households became empty nest. Unfortunately, the large bubble of now empty nest households, (particularly empty of elementary age students) will not reach their 70s during the life of these forecasts. It is at this stage of life when most households downsize, and new young families move in.

The demographic factors that will become the most influential over the next ten

years are the growth rate of empty nest household in the attendance areas, the number of sales of new homes, the rate and magnitude of existing housing unit "turn over," the relative size of the elementary and pre-school age cohorts and each area's fertility rate. Each of these factors will vary in the scale of their influence and timing of impact on the enrollment trends of any particular elementary area.

Attendance areas that are currently experiencing a rise in empty nest households tend to be the same areas that are not the recipients of any large sustained new housing construction. Thus, areas like Stallings and Hemby Bridge will see net declines in elementary enrollment. While these areas will continue to see net in migration of families, it will not be at a sufficient rate to maintain current attendance levels.

As more elementary attendance areas become completely dependent upon existing home sales to attract new families, the overall elementary enrollment trend of the district will decline. Areas such as Wesley Chapel and Weddington will see their elementary enrollments peak in the next five years and then slowly decline. Thus, the best primary short- and long-term indicator for enrollment change in most of the attendance area will be the year-to-year rate of housing turnover. If the Total Fertility Rates of all the attendance areas remain at their current low levels (and they are forecasted to do so) they will insure that enrollments will continue to see slowing growth (or outright declines) even if the level of net out-migration is greatly reduced.

It is important to note that not all new housing construction results in an increase in elementary enrollment. Frequently in cases where the new home construction is primarily move up houses (priced $417,000 or higher, the lower limits of a jumbo

mortgage until 2008) the impact on enrollment is felt more at the middle and high school levels than at the elementary level. These homes are usually purchased by families who have completed their childbearing and the children they do have tend to be ages 10 and older.

Table 7: Internal Revenue Service Gross Migration Counts, Union County North Carolina, 2003-2004 to 2017-2008

	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
In-migration	10,318	12,826	14,978	16,030	14,526
Out-Migration	5,854	6,715	7,143	7,614	8,308
Net Migration	4,464	6,111	7,835	8,416	6,218

Yet, equally important are the factors of housing turn-over and "family formation." Areas with existing homes that have a large proportion of housing units owned by their residents and have a large proportion of their homeowners age 65 or older are prime candidates to experience a growing amount of housing turn-over. In the Union County Schools district, areas such as New Salem and Waxhaw are excellent examples of this trend. This area, which would normally see a dramatic drop in their enrollment numbers as the number of households with school age children decline, will see moderate changes and long term stability in their student populations as young families move into formerly empty nest housing units.

Additionally, areas that are characterized by the relatively high percentage of rental housing units and large concentrations of young adults typically are a source for

future students. In these cases, young adults or the newly married, move to these areas and establish households. Because the population is in prime child bearing ages, these areas also have both a high absolute number of births and a higher than the district average birth rate. Later, as family size increases, these families often move to single family homes--usually moderately priced single family homes in other parts of the school district.

Consequently, the East and Walter Bickett attendance areas (as well as other sub-attendance areas in the district with similar characteristics), serve as feeder areas for outlying attendance areas in the district. This internal migration flow is far more important in determining future enrollment trends than the construction of new single family homes since an average of five existing homes are sold for every new home built. Indeed, a close examination of the year to year trends in the family formation areas will serve as an excellent bellwether for short and medium term changes in areas that depend on in-migration for enrollment growth.

Middle School Enrollment

The total middle school enrollment for the district is forecasted to grow from 8,954 in 2009 to 10,021 in 2014, a 1,067 student or 11.0% increase. Between 2014 and 2019 middle school enrollment is forecasted to decline to 9,670, a decrease of 351 students or 3.5%. The difference in the size of the individual grade cohorts and the aging of students through the school system are the primary reasons why the middle school enrollment trends deviate from those of the elementary grades.

There are currently large grade cohorts enrolled in the elementary school grades compared to those in the middle schools' grade cohorts. As these elementary school cohorts "age" into middle school and smaller middle school cohorts age into high school, they increase the overall middle school enrollment level. Note how over the next five years the size of the incoming 6th grade class is larger than the previous year's 8th grade class, which has now moved on the high school. As long as this "bubble" in the enrollment pattern exists, there will be to some degree, an increase in middle school enrollment, at least until the 2014-2015 school year.

After the 2014-2015 school year, this cohort trend reverses. There will then be smaller grade cohorts entering the middle school grades compared to those leaving. The result is a modest level of decreased middle school enrollment until at least 2019. This trend will most likely continue beyond the end of the forecasts series.

A secondary, but equally important factor has been the large number of "move up" homes being built in the district. These homes, selling in excess of $417,000 tend to have children in the late elementary and middle school ages. Thus, the effect on enrollment from a new housing development with these types of homes would be first seen at grades five through eight. However, as the number of move up home being constructed in the district has declined dramatically over the last 3 years and will continue to decline over the next 10 years, the impact of in-migration will be reduced regarding year to year middle school enrollment trends.

These enrollment trends will not be consistent between the nine middle school attendance areas. Piedmont Middle School will see an enrollment pattern that shows somewhat weaker enrollment growth than the overall district middle school enrollment

trends. There is some enrollment growth in its elementary feeder area, but not to the same level as the district average. As this growth bubble enters middle school enrollments will rise, but will begin to level off after 2014.

Table 8: Total Middle School Enrollment, 2009, 2014, 2019

	2009	2014	*2009-2014 Change*	2019	*2014-2019 Change*	*2009-2019 Change*
Cuthbertson	920	1,152	*25.2%*	1,111	*-3.6%*	*20.8%*
East Union	832	877	*5.4%*	866	*-1.3%*	*4.1%*
Marvin Ridge	1,090	1,253	*15.0%*	1,121	*-10.5%*	*2.8%*
Monroe	814	1,089	*33.8%*	1,080	*-0.8%*	*32.7%*
Parkwood	795	897	*12.8%*	868	*-3.2%*	*9.2%*
Piedmont	889	974	*9.6%*	966	*-0.8%*	*8.7%*
Porter Ridge	1,376	1,498	*8.9%*	1,416	*-5.5%*	*2.9%*
Sun Valley	1,194	1,284	*7.5%*	1,210	*-5.8%*	*1.3%*
Weddington	1,035	944	*-8.8%*	979	*3.7%*	*-5.4%*
Total MS	**8,954**	**10,021**	*11.9%*	**9,670**	*-3.5%*	*8.0%*

The Monroe Middle School will experience an increase in students in a much greater magnitude than the district average. This area's feed schools have large elementary grade cohorts aging into the middle school that will continue until the 2014-15 school year. The school will then experience a stable enrollment pattern over the next 5 years as the entering and leaving cohorts are relatively the same size.

The Parkwood Middle School will see a 10 year enrollment trend that almost exactly mirrors the district average. The increasing size of the rising 5th grade cohorts in this area will produce a modest increase in enrollment until 2014. After 2014 the enrollment trend turns negative as the smaller cohorts currently in the early elementary grades begin to enter 6th grade.

High School Enrollment

Enrollment at the high school level is forecasted to grow from 10,819 in 2009 to 12,588 in 2014, an increase of 1,769 students or 16.4%. After 2014, the high school enrollment will continue to increase, but at a slower rate. The net result for the five-year period 2014-to-2019 will be an increase of 967 students to 13,555 or 7.7%. Growth rates for the 10 year period will range from 3.2% at Weddington High School to 116.1% at Cuthbertson. However it should be noted that a large segment of the 2009-2014 growth at Cuthbertson is due to the addition of a 12th grade in 2010 and the end of all "grandfathering" policies for students living in the feeder area but still attending their old high school.

The aforementioned effects of changes in cohort size on middle school enrollment are also affecting the growth patterns of the high school population. The difference here is that the period of growth for the high schools will continue until the 2017-18 school year. After that point the enrollment will then begin to stabilize.

Over the next eight years, the larger grade cohorts that will affect the middle school enrollment begin to enter high school. Until the current bubble of students (now extending back to grade 1) passes through the high school grades, there will be continued growth at the district's high school. The main difference is that the growth in the high school enrollment will continue throughout the life of the forecasts, peaking sometime around the year 2021.

Table 9: Total High School Enrollment, 2009, 2014, 2019

	2009	**2014**	*2009-2014 Change*	**2019**	*2014-2019 Change*	*2009-2019 Change*
Cuthbertson	685	1,423	*107.7%*	1,480	*4.0%*	*116.1%*
Forest Hill	927	981	*5.8%*	1,115	*13.7%*	*20.3%*
Marvin Ridge	1,237	1,571	*27.0%*	1,630	*3.8%*	*31.8%*
Monroe	829	1,053	*27.0%*	1,294	*22.9%*	*56.1%*
Parkwood	987	995	*0.8%*	1,130	*13.6%*	*14.5%*
Piedmont	1,002	1,288	*28.5%*	1,398	*8.5%*	*39.5%*
Porter Ridge	1,510	1,590	*5.3%*	1,572	*-1.1%*	*4.1%*
Sun Valley	1,311	1,384	*5.6%*	1,579	*14.1%*	*20.4%*
Weddington	1,224	1,208	*-1.3%*	1,263	*4.6%*	*3.2%*
Total HS	**10,819**	**12,588**	*16.4%*	**13,555**	*7.7%*	**25.3%**

It is important to note that the vast majority of this future high school enrollment growth will be a result of students aging into those grades. Specifically, students who already live in the district (and not in-migration of students ages 14 to 18) will be the primary cause of the forecasted increase in high school enrollment. Additionally, as was mentioned early, these forecasts represent the demographic changes that will affect high school enrollment. Any changes in the district's student transfer policy will need to be added or subtracted from the forecast result.

High school enrollment is the most difficult of all the grade levels to project. The reason for this is the varying and constantly changing dropout rates, particularly in grades 10 and 11. For these forecasts the dropout rates at the high school were calculated for each grade over the last five years. These five-year averages were then held constant for the life of the forecast. The effects of any policy changes dealing with any school's drop out rates, program placement or reassignment of former students to new grade levels will need to be added or subtracted from the forecast results.

REFERENCES

McKibben, J.

The Impact of Policy Changes on Forecasting for School Districts. <u>Population Research and Policy Review</u>, Vol. 15, No. 5-6, December 1996

McKibben, J., M. Gann, and K. Faust.

The Baby Boomlet's Role in Future College Enrollment. <u>American Demographics</u>, June 1999.

Peters, G. and R. Larkin

Population Geography. 7<u>th</u> Edition. Dubuque, IA: Kendall Hunt Publishing. 2002.

Siegel, J. and D. Swanson

<u>The Methods and Materials of Demography: Second Edition</u>, Academic Press: New York, New York. 2004.

Smith, S., J. Tayman and D. Swanson

<u>State and Local Population Projections</u>, Academic Press, New York, New York. 2001.