Regional School District 13

Durham & Middlefield

School Enrollment Dynamics & Projections 2012-2021

Prepared for the

Regional School District #13
Board of Education

H. C. Planning Consultants, Inc.
397 Fairlea Rd., Orange, Connecticut

May 17, 2012

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Hyung C. Chung, Ph.D.
President

Ms. Susan Viccaro
Superintendent
Regional School District 13
135A Pickett Lane
Durham, CT 06422

May 17, 2012

Dear Ms. Viccaro,

We are pleased to submit our report, entitled *Regional School District 13, Durham/Middlefield School Enrollment Dynamics & Projections, 2012-2021*, dated May17, 2012 . Please note that the summary report is prepared as a stand-alone report. Both the summary and the main reports are lengthy because we wanted to explain the rationale for the projections. I look forward to presenting the report to the RSD 13 Board of Education on May 23rd.

Sincerely Yours,

Hyung C. Chung
President, HCPC, Inc.

HC/jc
Encl.

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This report supersedes all the draft reports that were previously issued. All forecasts and projections are presented not as predictions. Projections are made based on selected past trends and a set of assumptions and offered as a guide to the school facilities planning.

SECTION 1

INTRODUCTION

1.1 Introduction

In this report, we present the 10-year enrollment projections by grade for Regional School District #13, which serves both Durham and Middlefield. There are four schools in the Town of Durham and two schools in the Town of Middlefield, and in 1969 both towns entered into an agreement to form a regional school district. There are three elementary public schools in Region 13, serving grades PK through 4: Brewster Elementary School (pre-K and K-2) located in Durham, Korn Elementary School (Grades 3-4) in Durham, and Lyman Elementary School (K-4) in Middlefield. There are two middle schools in Region 13: Memorial Middle School in Middlefield, serving all students in grades 5 and 6, and Strong Middle School in Durham, serving grades 7 and 8 students from both towns. A high school, Coginchaug Regional High School, is located in Durham and serves all students in grades 9-12.

1.2 Current Enrollment

Regional School District #13 public school enrollments by grade as of October 1, 2011 (projection base year) are shown below:

TABLE 1.1
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOL ENROLLMENT
AS OF OCTOBER 1, 2011

Durham

	PK3	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	K-12
Brewster ES, P3-2	13	9	46	55	48											149
Korn ES, 3-4						77	65									142
Lyman ES, K-4			23	34	27	41	37									162
Memorial MS, 5-6								123	101							224
Strong MS, 7-8										114	119					233
Coginchaug Reg. HS												95	83	110	99	387
Column TOTAL	13	9	69	89	75	118	102	123	101	114	119	95	83	110	99	1297

MIDDLEFIELD

	PK3	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	K-12
Brewster ES, P3-2	4	5	13	17	25											55
Korn ES, 3-4						25	25									50
Lyman ES, K-4			19	28	30	28	33									138
Memorial MS, 5-6								59	42							101
Strong MS, 7-8										70	55					125
Coginchaug Reg. HS												55	53	45	42	195
Column TOTAL	4	5	32	45	55	53	58	59	42	70	55	55	53	45	42	664

REGION 13

	PK3	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	K-12
Brewster ES, P3-2	17	14	59	72	73											204
Korn ES, 3-4						102	90									192
Lyman ES, K-4			42	62	57	69	70									300
Memorial MS, 5-6								182	143							325
Strong MS, 7-8										184	174					358
Coginchaug Reg. HS												150	136	155	141	582
Column TOTAL	17	14	101	134	130	171	160	182	143	184	174	150	136	155	141	1961

K~4 Total = 696 Grades 5~8 Total = 683 Grades 9~12 Total = 582

Source: Regional School District #13 Public Schools. The 2011 enrollment data are not published by the Connecticut State Department of Education (CSDE) as yet and there is no way to verify the accuracy. Accordingly, 2011 enrollment data are considered as 'provisional'.
In 2010, there were 279 PK-12 RSD resident students who were attending nonpublic schools. Of those nonpublic school students, 14 students attended public schools in other towns and charter schools, 44 students attended Vocational-Technical schools, and 221 students attended private/parochial schools (See Appendix Table 2.13 in Section 2). Comparable 2011 data are not yet available.

There were 696 K-4 students in R13's elementary Schools, 683 grades 5~8 students in the two middle schools, and 582 grades 9-12 students in Coginchaug Regional High School. Altogether there were 1,961 K -12 students as of October 1 2011. In addition, there were 17 P3 and 14 PK students in Brewster ES. As required for all school districts in Connecticut by the state's Department of Education, school enrollment data presented in this report are calculated as of October 1st for each school year because school enrollments tend to be unstable during the month of September.

1.3 Projection Methodology

Three different methods, the Cohort-Survival Method, the Multiple Regression Method, and the ShareRatio™ Method, were used to forecast enrollment by grade. Prior to the enrollment projections, assumptions on birth trends, level of nonpublic school enrollment, residential development, and unemployment rate were established. Several multiple regression analyses were constructed to assure the validity of the assumptions adopted for the projections.

1.4 Projections vs. Predictions

Future school enrollments can be estimated because, for the greater part, they are the results of events that have already taken place: for example, most of the children born five years ago will enter kindergarten classes this year, the first graders this year will become the second graders of next year, and so forth. When new housing units are built in a town, they will generate children year after year. Therefore, there is a clear causal relationship between past events and future outcomes. The projection methods thus rely on this past-future causal relationship: the future enrollments are estimated by extending (projecting) the past trends into time. Many of these past events play a role as leading indicators of enrollment changes to come.

Unfortunately, future outcomes are not based solely on past events. Events that have not yet taken place will also have an impact on future outcomes. For instance, the current year's school

enrollments are partially determined by current factors such as the number of new housing units being built, pre-owned home sales, economic conditions, and the number of resident students attending nonpublic schools this year. The difficulty of estimating these coincidental indicators brings a certain amount of fallibility into our calculations of how many children will enroll in school each year. Thus, we project, but we do not predict. Projections are inherently limited. Projections are further limited because of the impossibility of our knowing exactly what past and present events might have an impact on the future, the subsequent difficulty of collecting comprehensive sets of needed data, and limitations in the ability of models and theories to reveal the exact causal relationship between selected past events and the future. In our attempt to overcome these difficulties, we continue to set the highest standards: in this report, more variables affecting future enrollments are identified, more data are collected and analyzed, and more rigorous explanatory models are applied here than in any other comparable set of school enrollment projections.

1.5 Trends, Cycles, and Random Changes.

Annual variations in school enrollment may be caused by three types of variables*: trend, cyclical, and random factors. Trends are those changes that are consistent with past linear current processes that extend toward the future so that future changes may be seen as an extension of past trends; many of our school enrollment projections rely on these past trends. Cyclical changes are those variables which are sensitive to economic or business cycles: enrollments move up when the economy is good, and move down as the economic cycles move downward. Random changes are changes whose roots are so complex that they cannot be anticipated. Wars, natural calamities, or sudden influxes of immigrants may have impacts on enrollment, but we cannot foretell such events ahead of time.

In this report, we are trying to project a trend line, and therefore actual annual enrollment figures are likely to be different from the trend-line projections due to cyclical and random variables.

1.6 Projections of Small Numbers

Projections of small numbers are prone to yield large percentage errors because random and cyclical factors tend to have a magnified impact on small samples. Thus, the impacts of cyclical and random factors on school enrollments are more likely to be exaggerated in small schools than in large schools. For example, when a single student in a class of fifty students drops out unexpectedly, a 2% reduction in enrollment occurs. In contrast, a reduction of one student in a class of 200 students will reduce enrollment by only 0.5%. A demographic study requires a large amount of computations, and just the numerical rounding by a computer may produce one or two enrollment variances in the enrollment projections.

* In addition, seasonal variables can be observed. School enrollment can undergo considerable change from month to month, particularly in inner city schools. However, suburban and rural school enrollments do not change significantly on a monthly basis.

Historically, the significance of random and cyclical factors is exhibited by the considerable fluctuations of school enrollments and many underlying variables such as the number of births, nonpublic school enrollments, home constructions, etc. Thus, small towns' enrollment data fluctuate considerably in terms of percentages from year to year in contrast to the relatively smooth changes shown by the school enrollments of large school districts. Similarly, the projections of individual school enrollments and enrollments by grade are susceptible to larger percentage deviations than the total projections for district-wide enrollments when unexpected cyclical and random factors come to play in the future.

SECTION 2

FACTORS INFLUENCING PUBLIC SCHOOL ENROLLMENT GROWTH

2.1 Introduction

The school enrollment growth and decline of a school district is directly related to factors such as the number of births in a district, the net migration of the population (in-migration minus out-migration), the number of new and pre-owned home sales, and the percent of resident students attending nonpublic schools. These factors are in turn related to a number of land use and economic variables such as residential development and the unemployment rate. Accordingly, data on these factors were collected and their impacts on school enrollment growth were assessed.

2.2 Births

Annual birth data are very important to determine the future number of kindergarten pupils and subsequently enrollment figures for upper grades. Past data on births up to 2011 are available from the Connecticut Department of Public Health. As shown below, the number of births in a given time period is determined by two factors, the number of females of childbearing age (15 to 49 years of age) and the fertility rates (average # of births per 1000 females of childbearing age).*

[2.1] # of Births = # of Females of Childbearing Age x Fertility Rates

However, it must be noted that the fertility rates are significantly affected by the economic conditions prevailing each year: that is, annual fertility rates are found to be inversely or negatively influenced by the annual unemployment rates. That is, when the unemployment rates decline or the economy is improving, the fertility rates go up and the number of births is likely to increase, other factors being equal; and the reverse is also true.

2.3 Economic Conditions: Unemployment Rates of Connecticut and the RSD 13

As noted earlier, the number of births are affected not only by the number of childbearing age females but also fertility rates, which are in turn significantly affected by economic conditions represented by unemployment rates. Accordingly, we review the unemployment rates of Connecticut and towns of Durham and Middlefield as shown in Figure 2-1 on the next page.

* In order to estimate the number of births, we multiply age-specific fertility rates to the number of childbearing age females of each age group.

FIG. 2-1
UNEMPLOYMENT RATE TRENDS OF CONNECTICUT,
DURHAM AND MIDDLEFIELD, 1975-2011

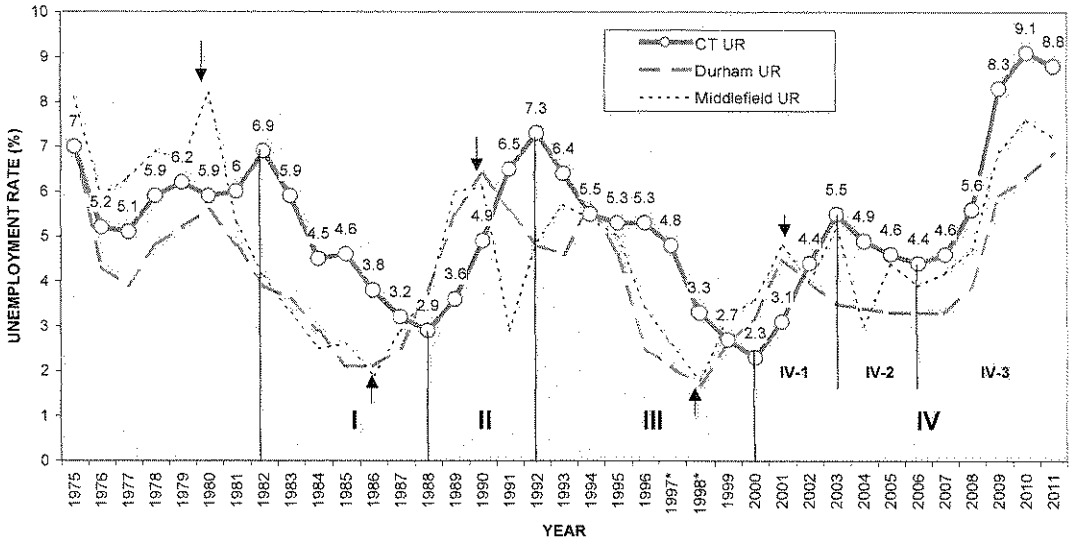

Figure 2-1 above compares unemployment rates of Durham and Middlefield with CT's unemployment rate. Note that: (1) unemployment rates of Durham and Middlefield are somewhat (1.5~3.0%) lower than CT's, but their trends are more or less parallel to Connecticut's unemployment rates; (2) Middlefield's unemployment rates are slightly greater and more volatile than those of Durham; (3) peak and trough unemployment rates of Durham and Middlefield generally precede those of Connecticut by one or two years. We can divide Connecticut unemployment between 1982 and 2011 into four (I, II, III and IV) periods of rising and falling unemployment rates. Observe the roller coaster trend in unemployment rates: Periods I and III are down cycles while Periods II and IV are up cycles of unemployment rates. In short, the economy apparently experienced repeated down-then-up cycles. The up trend of unemployment in Period IV can be further subdivided into three shorter periods: up, slightly down, then sharply up. Indeed, the Connecticut economy had been worsening since 2000: the period began with the aftermath of 9/11 and the Iraq War and ended with the Great Recession of 2008, the bursting of the housing bubble, the financial meltdown, and a stubbornly persistent high unemployment rates.

The inverse relationship between the number of births and unemployment rates is shown by the following equation:

[2.2] BR13(T) = 155.1963 - 4.159016 UCT(-1) - 4.272052 UM (-3) (2000-2011)

(19.27) (-2.62) (-2.78)

$\bar{R}^2$ = 0.528 SEE = 8.28 D.W. = 2.16 MDV = 116.92

In equation 2.2, BR13(T) = the number of births in Region 13 in the year T; UCT(-1) = the unemployment rate of Connecticut a year ago; and UM(-3) = the unemployment rate of Middlefield residents three years ago (T-3). The figures in parentheses in the second row are t-ratios; R^2 = the coefficient of determination; SEE = Standard Error of Estimates; D.W. = Durbin Watson statistics; and MDV = the mean of the Dependent variable.* Equation 2.2 indicates that the growth trend of births in Region 13 is negatively correlated to the both Connecticut and local (Middlefield represents both Durham and Middlefield) birth trends. When Connecticut's unemployment rate increased by one percent, Region 13's births declined by 4.2 births; another 4.3 births declined per a one percent increase in Middlefield's unemployment rate three years ago.**

2.4 Trends of Childbearing Age Women in Connecticut and Regional School District #13

The magnitude of the growth or decline of births must be understood in terms of the relative magnitudes of the rise and fall in the number of childbearing-age (CBA) women and the unemployment rates. For this reason, Table 2.1 shows the history and projected number of females in Regional School District #13 based on the population censuses conducted by the U. S. Bureau of Census and the population projections prepared by the Connecticut Data Center at the University of Connecticut. The projections were prepared in 2007 prior to the 2010 Population Census. Nonetheless, these pre-census numbers would show the general direction and magnitude of growth/decline in the number of childbearing age females for the two towns that constitute Regional School District #13.***

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* See Appendix 2-A on page 2-18 for explanation of statistical terminology.

** We also produced the equation below to show a longer-term relationship between the number of births and unemployment rates.

[2.3] BR13(T) = 145.5359 - -3.575101 UM(-2) - 3.415439 UM (-5) (1985-2011)
(19.27) (-2.62) (-2.78)
$\bar{R}^2$ = 0.386 SEE = 11.21 D.W. = 1.86 MDV = 114.56

In equation 2.3, BR13(T) = the number of births in Region 13 in the year T; UM(-2) = the unemployment rate in Middlefield two years ago; and UM(-5) = the unemployment rate of Middlefield residents five years ago (T-5). This equation points out that the inverse relationship between the number of births and unemployment rates holds true for a very long period as well as for a relatively short period. However, the equation for a short period may be more accurate than the long-term equation.

***The nation's fertility rate has been undergoing some changes: as an increasing percentage of women are better educated and participate in the labor market, many opt to postpone marriage and the birth of their first child. This delayed childbirth effect generally results in a smaller household size, or fewer children per household.

TABLE 2.2
NUMBER OF CHILDBEARING AGE FEMALES
REGIONAL SCHOOL DISTRICT 13 (DURHAM AND MIDDLEFIELD), CONNECTICUT, 1990-2030

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	15-49
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1980	434	306	339	388	389	253	265	2374
1990	302	257	300	423	486	427	351	2546
2000	274	162	196	380	535	515	472	2534
2010*	430	329	181	164	362	526	572	2564
2020*	378	324	340	334	313	287	384	2360
2,030*	392	325	288	330	474	457	335	2601
1980-1990	-30%	-16%	-12%	9%	25%	69%	32%	7%
1990-2000	-9%	-37%	-35%	-10%	10%	21%	34%	0%
2000-2010	57%	103%	-8%	-57%	-32%	2%	21%	1%
2010-2020	-12%	-2%	88%	104%	-14%	-45%	-33%	-8%
2020-2030	4%	0%	-15%	-1%	51%	59%	-13%	10%

Source: 1980 and 2000 data are **from** the U.S. Population Censuses **for** respective years.
* 2010 through 030 population data are prepared based on the population projections prepared in 2007 by the Connecticut Data Center in the University of Connecticut.

FIG. 2-2
TREND OF CHILDBEARING-AGE FEMALES
IN REGIONAL SCHOOL DISTRICT 13, 1980-2030

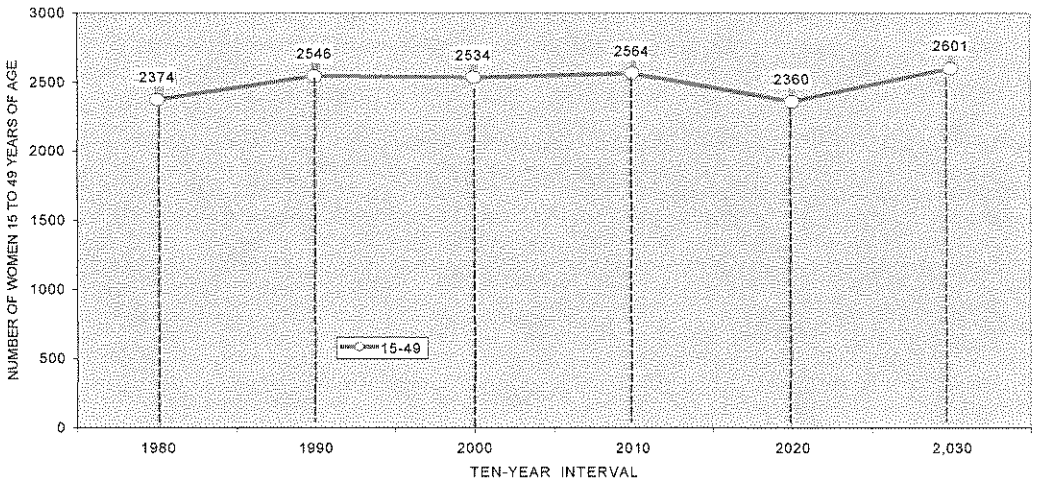
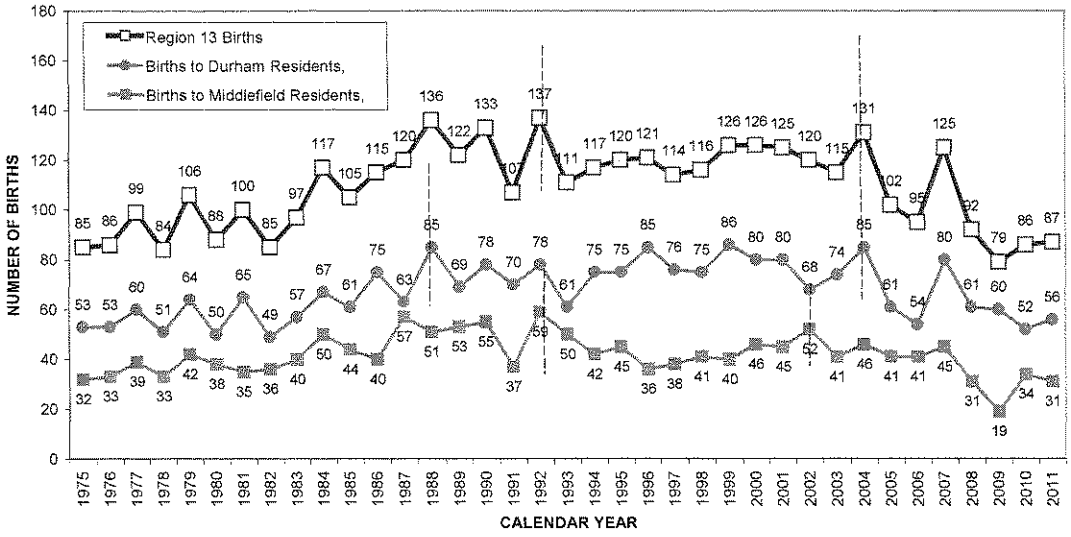


Figure 2-2 (which was drawn based on Table 2.1) shows that the number of CBA women in RSD 13 had been increasing up to 1990, and the number of CBA women did not significantly change for almost two decades between 1990 and 2010, maintaining a level slightly above 2,500 women. Then, since 2010 it is forecast that the number of CBA women will decline from 2,564 persons in 2010 to 2,360 persons, losing approximately 200 persons or 8% in a decade. However, it is also projected that the number of CBA women may increase considerably because the 'echo baby boomers' (children of baby boomers) will come of childbearing age themselves.

2.6 Birth Trends of Regional School District #13

Now we are ready to review the birth trends of Regional School District #13 as shown in Figures 2-3 and 2-4.

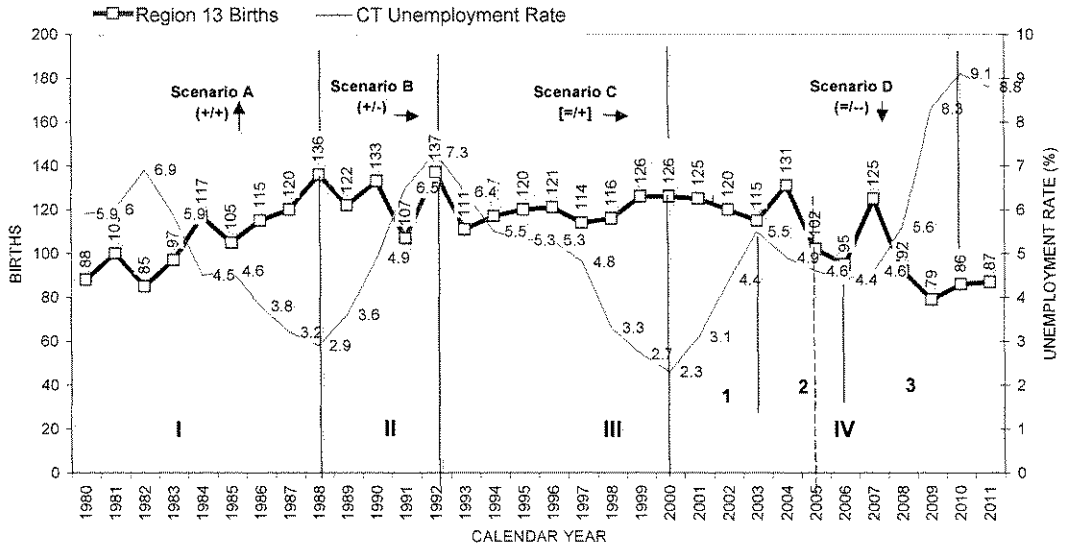
FIG. 2-3
BIRTH TRENDS OF REGIONAL SCHOOL DISTRICT 13,
DURHAM & MIDDLEFIELD, 1975-2011



Observe in Figure 2-3 that:

(1) Middlefield's births began to increase from a low of 32 births in 1975 to a peak 59 births in 1992. It then gradually decreased to 45 births in 2007, plummeting to 19 births in 2009. Subsequently, the number of births in Middlefield rebounded to 34 births in 2010 and 31 births in 2011, but it appears the trend is still in a declining mode. (2) In the meantime, births in Durham began to increase from a low of 49 births in 1982, peaking in 1999 at 86 births but decreasing to 52 births in 2010. More recently the number of births in Durham rebounded somewhat to 56 births in 2011. (3) Combining the birth trends of both Durham and Middlefield, we obtained the birth trend for Regional School District #13. The region's births increased from a low of 84 births in 1978 and after 14 years, the birth level reached a peak at 137 births in 1992. Note that the number of births in Connecticut also peaked in 1990 due to the fact that there were a maximum number of childbearing-age females aged between 15 and 49 years old in 1990. After the peak births, the birth trend in RSD 13 recorded a long-term decline reaching a low of 79 births in 2009, impacted by the Great Recession of 2008. In fact, this is the lowest number of births in RSD 13 since 1975.

FIG. 2-4
IMPACT OF CONNECTICUT UNEMPLOYMENT RATES ON BIRTHS
REGIONAL SCHOOL DISTRICT 13, 1975-2011



In Fig. 2-4 above, we charted the actual birth trend of RSD 13 along with the Connecticut unemployment rate trend. Note that the CT unemployment rate (UR) trend is classified into four periods, two periods of a falling UR (I and III) and the other two periods of a rising UR (II and IV). Thus, the number of births in RSD 13 between 1982 and 1988 was increasing because the number of CBA women was increasing (+) and the economy was improving (+); then between 1988 and 1992 the number of CBA women was stable or flat (=) but the economy was deteriorating with a rising UR (-) Accordingly, the net effect was that the number of births was on average flat albeit with considerable annual fluctuations due to increasing unemployment rates, that is, a deteriorating economy. After 1992, the number of CBA women in RSD 13 was no longer increasing (that is, the trend line was flat) but the economy turned around and began to improve, achieving a very low unemployment rate by the year 2000: the UR was 2.3%, and as a result, the number of births in RSD 13 moved up very slowly with very little annual fluctuation in Period III. But beginning in the year 2001, with the event of 9/11 and the ensuing Iraq War, the unemployment rate began to rise and the number of births also began to decline. Although there was a period of temporary reversal between 2003 and 2006 (Period IV-2), the number of births in RSD 13 dropped sharply beginning in 2007, and further exacerbated by a series of economic woes (bursting of the housing bubble and a worldwide financial meltdown). The unemployment rates in the nation, Connecticut and the region reached a very high level of 9 to 10%, a number unprecedented in the history of RSD 13. As a result, the number of births in RSD 13 plummeted to 79 births in 2009. At present, the nation is indeed anticipating a slow economic recovery by so that we are witnessing a slight dip in the unemployment rate (UR) and only a slight increase in births in both Durham and Middlefield. This account is summarized in Table 2.3.

Table 2.3

FOUR TYPES OF BIRTH TRENDS DUE TO THE CHANGING NUMBER OF CHILDBEARING AGE FEMALES AND ECONOMIC CONDITIONS

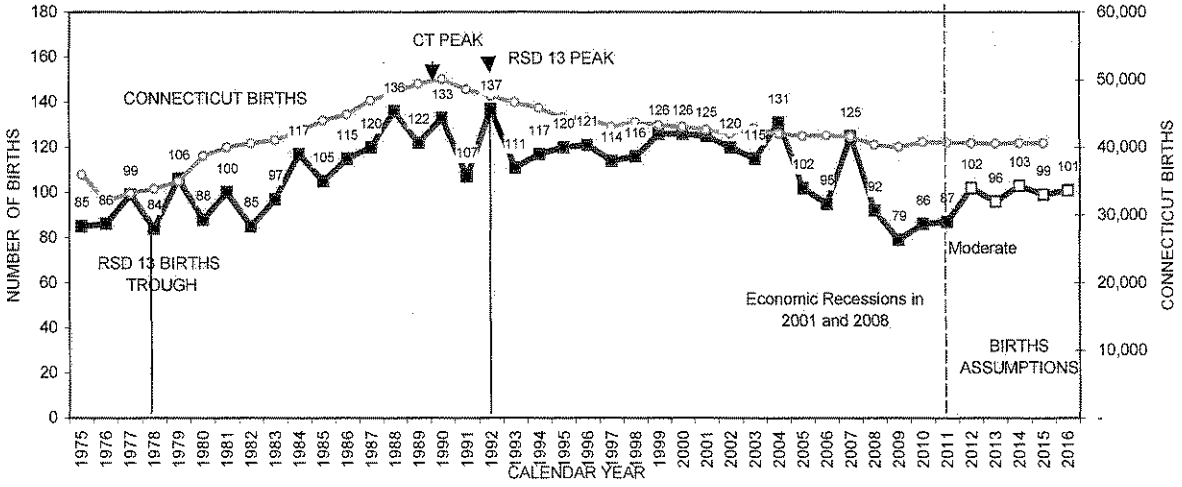
Birth Trend Types	# of CBA Females	Economic Conditions	Fertility Rates	# of Births
A 1982-1988	Increasing (+)	Improving economy (+) because UR falls	Increasing (+)	Steadily increasing (++)
B 1988-1992	Increase (+)	Worsening economy (-) because UR rises	Decreasing (-)	Increasing with severe annual fluctuation (=)
C 1992-2000	Not increasing or flat (=)*	Improving economy (+) because UR falls	Increasing (+)	Slight increase (+)
D 2000-2011	Not increasing or flat (=)	Reversionary economy (-) because UR sharply rises	Decreasing (-)	Sharply decreasing (--)

*Nationwide the number of childbearing-age women had been declining since 1990.

Beyond 2010: Despite a slowly improving economy, beginning in 2010, the population projections shown on Figure 2-2 indicate an 8% decline in the number of women aged between 15 and 49 years old. These projections may harbinger that the end of a declining birth trend in RSD 13 has not yet arrived. But, if the economy improves faster than we assume, then the number of births in the region may show moderate increases as shown in Figure 2-5.

Applying Equation 2.2 and assuming that the economy improves moderately, we came up with the birth projections for the years 2012 through 2016 and they are compared with the projected births for Connecticut.

FIG. 2-5
ANNUAL BIRTHS IN REGIONAL SCHOOL DISTRICT 13 AND CONNECTICUT
1975-2011 (HISTORY) AND 2012-2016 (ASSUMPTIONS)



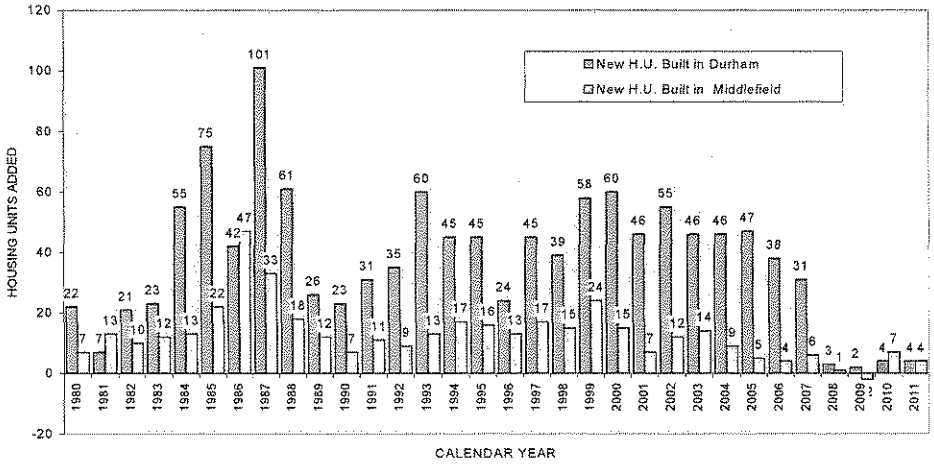
2.6 Residential Development in Middlefield and Durham

New residential development is likely to increase public school enrollment as the town attracts new people to a district, including families with school-age children. Therefore, many communities watch residential growth trends very closely, particularly in terms of their relationship with public school enrollment growth. Appendix Table 2.3 presents the number of new dwelling units built in Middlefield and Durham since 1970.

Durham: Figure 2-6 (see also Appendix Table 2.4, column 1) shows that new home construction in Durham fluctuated considerably from year to year reflecting the economic conditions prevailing each year. Durham built 8 new homes in 1981 and 103 units in 1987, the latter being the largest number of units built since 1980. In 1987, with the onset of the recessionary period, new home construction activities quickly declined resulting in only 24 units being built in l990, and this roller coaster pattern in home building repeated itself throughout the remaining years. The downturn in new home construction in Durham has been especially harsh since 2008, the year of the Great Recession: within a year new home construction dwindled from 31 units in 2007 to a mere 3 units in 2008; numbers have remained at that level ever since.

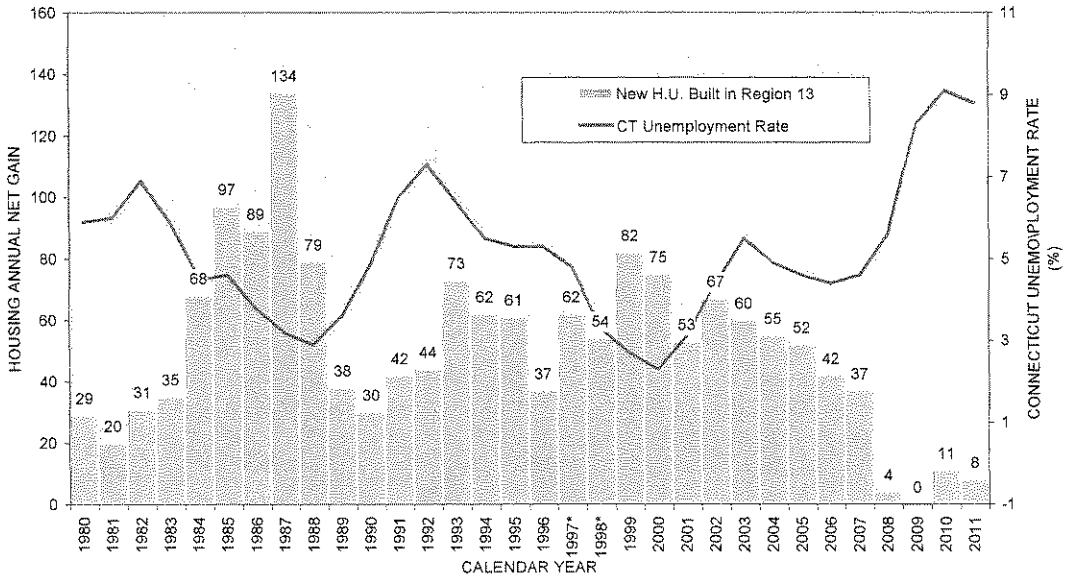
Middlefield: The fluctuating patterns of residential construction activities in Middlefield closely resemble those of Durham. Figure 2-6 also reveals that only 8 housing units were built in Middlefield in 1980 but 47 units were built in 1986, the largest number of new homes introduced to Middlefield since 1980. Since then, new home construction in this rural town has been fluctuating between 7 and 26 units per year until 2005;building activity then plummeted to 4 units in 2006 and reached only 1 unit in 2009. Fluctuating numbers continue with 7 new homes built in 2010 but only 4 units in 2011.

FIG. 2-6
NEW HOUSING UNITS ADDED AND UNEMPLOYMENT RATE OF
DURHAM AND MIDDLEFIELD, 1980-2011



RSD 13: Figure 2-7 below and Appendix Table 2-4 show the new home construction (in terms of housing net gain, i.e., new homes minus demolitions) trend of Regional School District #13 and the Connecticut Unemployment Rate. Since RSD 13 is the combination of Durham and Middlefield, the new construction trend of the RSD is identical to the trends exhibited by its component towns. Thus, housing net gains increased from a low 20 in 1981 to the peak level of 134 units in 1987; numbers declined to 30 units in 1990 with a gradual increase to 82 units in 1999; there was another decline to 37 units in 2007, a further plummet to 4 units in 2008, no change in 32009, and a rebound to 11 units in 2010 and to 8 units in 2011.

FIG. 2-7
NEW HOUSING UNITS ADDED IN REGIONAL SCHOOL DISTRICT 13
AND UNEMPLOYMET RATE, 1980-2011



This roller coaster pattern of ups and downs is a mirror image of the ups and downs of Connecticut's unemployment rate: in short, new home construction and unemployment rates are inversely or negatively correlated as shown by a regression equation below:

[2-2] HNET(T) = 109.4271 (T) - 11.33403 UCT(T) (1980-2011)

(8.19) (-4.48)

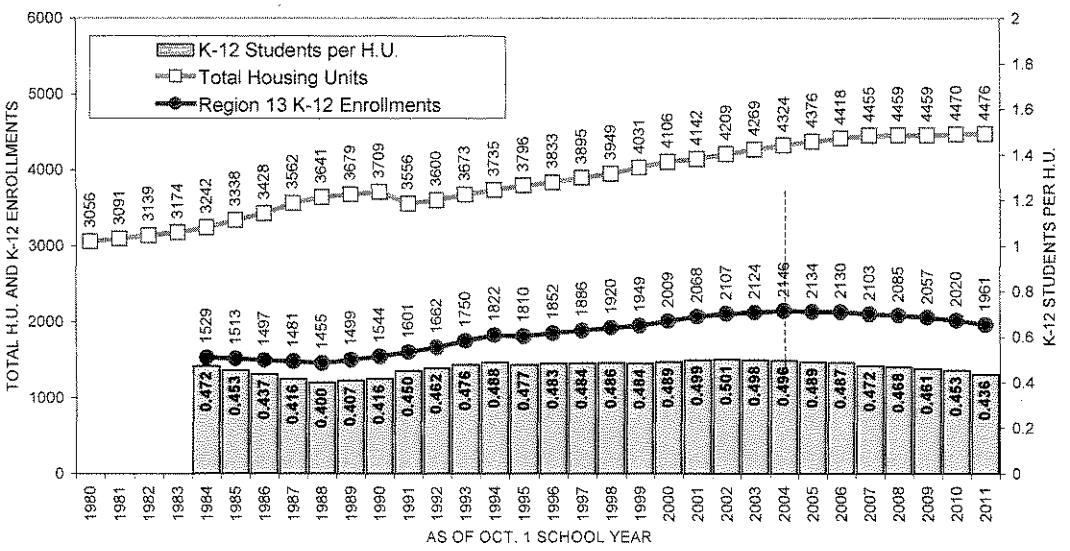
R^2 = 0.388 SEE = 22.08 D.W. = 1.06 MDV = 52.38

In equation 2.2 shown above, HNET(T) = the number of new homes added (as a net) in Region 13 in the year T; UCT(T) = the unemployment rate in Connecticut in the year T. The figures in parentheses in the second row are t-ratios; R^2 = the coefficient of determination; SEE = Standard Error of Estimates; D.W. = Durbin Watson statistics; and MDV = the mean of the dependent variable, i.e., HNET.

2.7 Enrollment Multipliers

We can derive an enrollment multiplier of 0.435 students per housing unit in RSD 13 by dividing the total number of K-12 students by the total number of housing units in the region in 2010.* From Figure 2-8 below, note that the K-12 enrollment multipliers for RSD 13 have been shrinking because public school enrollments have been decreasing since 2004 while the housing stock in RSD 13 has been continually increasing.** Put it another way, the number of housing units has been increasing faster than the population growth because there have been more single-person households (more elderly households, single mothers, late marriage, etc.). Thus the average household size has been decreasing in Region 13 which parallels a long-term national trend. According to Fig. 2-8, as a rule of thumb we can multiply the 0.435 students per housing unit multiplier to the planned number of housing units to estimate the number of students to be generated by a residential development.

FIG. 2-8
REGION 13 K-12 ENROLLMENTS PER HOUSING UNIT
1980-2011



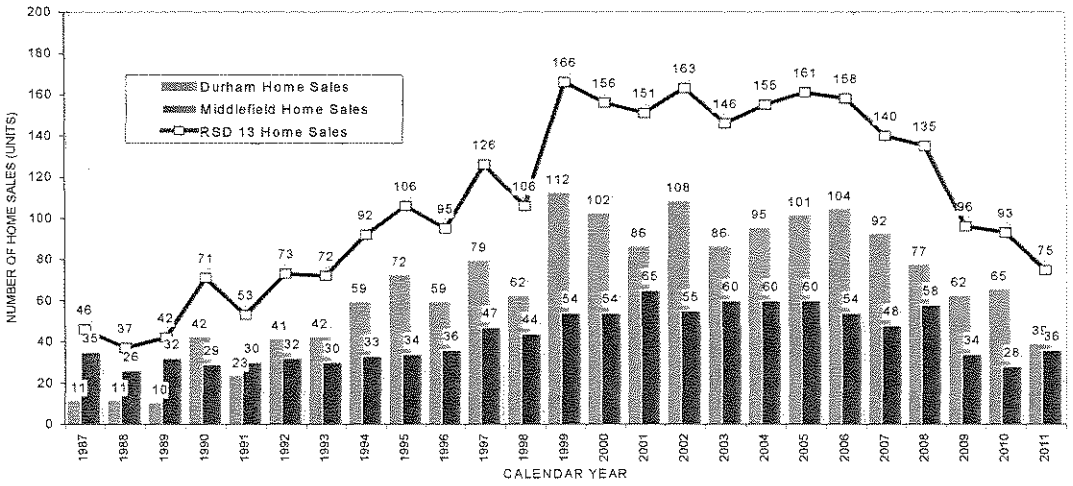
* Similarly we found K-12 enrollment multipliers of 0.5276 students/unit for Durham and 0.3882 students per unit in Middlefield in 2010.

** Also, note from Fig. 2-8 that K-12 enrollment multipliers were at its lowest level (0.400 students per housing unit) in 1988 and at its highest level (0.501 K-12 students per housing unit) in 2002.

2.8 Home Sales in Durham and Middlefield

Figure 2-9 (also Appendix Table 2.5) shows the number of home sales in Durham, Middlefield, and Regional School District #13 as a whole. The average sales during the past ten years were roughly 83 homes per year for Durham and 49 homes per year for Middlefield. However, the average number of home sales over the past three years dropped to 55 units per year in Durham and 33 units per year in Middlefield. It appears that the home turnover rate has decreased in recent years. As expected, the residential real estate market in Regional School District #13 was lively, and home sales advanced from 37 units in 1988 to 166 units in 1999, but sales then stagnated between 2000 and 2006, to dwindle to 75 home sales in 2011 as a result of the economic recession that began in 2008 with the end of the housing bubble. Clearly, the economy plays a very important role in determining home sales trends, which in turn strongly affects public school enrollments.

FIG. 2-9
HOME SALES TRENDS IN DURHAM, MIDDLEFIELD AND REGIONAL SCHOOL DISTRICT 13, CR, 1987-2011



The housing sales in RSD 13 show that the largest number of home sales (166 units) took place in 1999 decreasing slightly to 161 units in 2005; afterwards, the home sales trend began to decline very rapidly reaching 75 units in 2011, much less than one half of the 1999 level of home sales.

2.9 Housing Turnover Rate and Housing Price

The housing turnover rates of an area are represented as the home sales of a given year as a percent of the total housing stock in an area. As shown in Figures 2-10 and 2-11, the housing turnover rates of Durham and Middlefield are very low (below 4% for RSD 13) indicating a stable community where many families live in their town for a long time and hardly move. The highest turnover rate recorded in Durham was 4.9% (that is, roughly 1 out of 20 homes were sold) in 1999 when a large number of homes were also sold. In contrast, Middlefield's turnover rate was 3.5% in 2001 (roughly one in 30 houses were sold). However, these high rates in both towns

were the historical maximums and normally the housing turnover rates were 1 out of 40 homes in Durham and 1 out of 60 homes in Middlefield.

FIG. 2-10
MEDIAN HOME SALES PRICE OF SINGLE FAMILY HOMES
AND HOME TURNOVER RATE
MIDDLEFIELD, 1988 - 2011

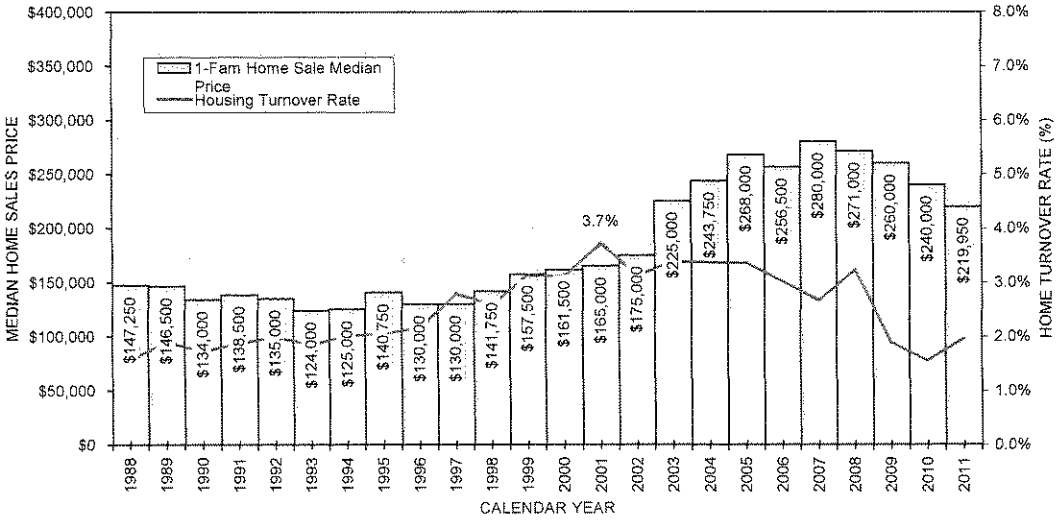


FIG. 2-11
MEDIAN HOME SALES PRICE OF SINGLE FAMILY HOMES AND
HOUSING TURNOVER RATE IN DURHAM, CT. 1989 - 2011

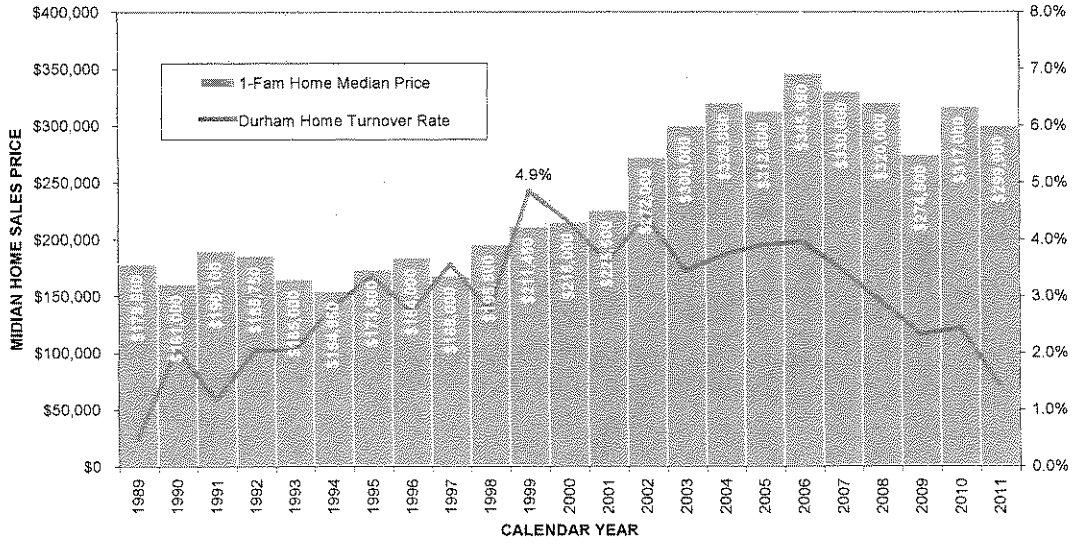


Figure 2-11 presents the median prices of home sales in Durham. Note that the highest median price for Durham home sales was $345,950 in 2006 but the price dropped to $274,500 in 2009, a decline of 21% in three years. In the meantime, as shown in Figure 2-10, Middlefield's median home sales price dropped from $280,000 in 2007 to $240,000 in 2010, a drop of 14.3% in three years. These numbers show the adverse effect of the Great Recession and the bursting of a huge nationwide housing bubble in 2008.

Note also that the housing price of an area is positively correlated with the housing turnover rate: namely, housing prices rise or fall as the housing turnover rate rises or falls.

[2-3] HSPM (T) = -$34,410 + $55,107 HTM(-4) + 32,988 HTM(-5) (1993-2011)

(-2.67) (5.41) (3.45)

R^2 = 0.950 SEE = $12,977 D.W. = 1.53 MDV = $195,510

In equation 2.3, HSPM(T) = home sales price in Middlefield in the year T which is positively affected by HTM(-4) and HTM(-5) = home turnover rates of four years and five years ago, respectively. In short, the housing turnover rate of an area is a good predictor of the home sales price. When there are more buyers than homes are available, that is, when homes are selling well, homes are sold at higher prices, and vice versa. In general, a slower home turnover rate implies a smaller net migration of school age children.

2.10 Resident Pupils Attending Nonpublic Schools

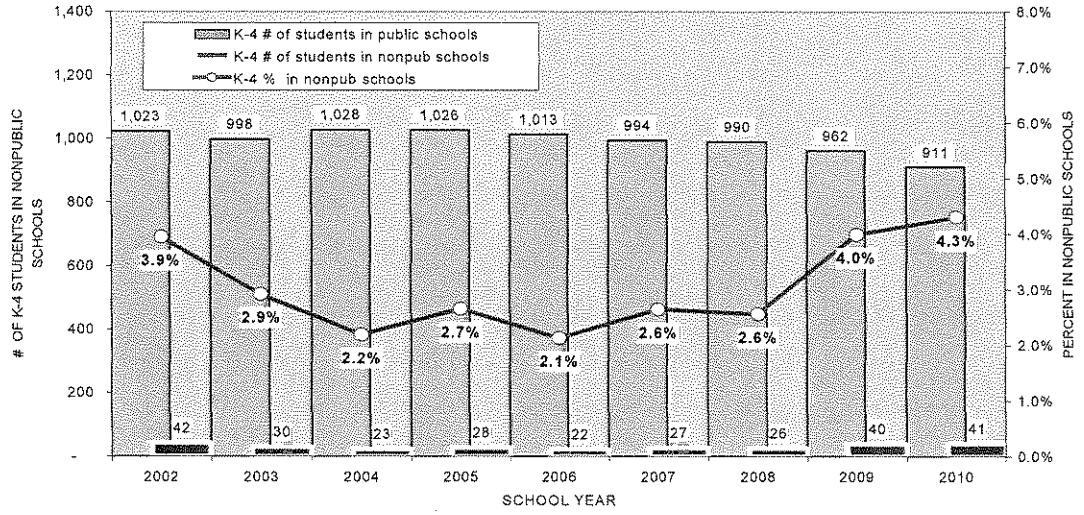
Regional School District #13's public school enrollments are affected by the number of students who reside in Durham and Middlefield but attend nonpublic or non-local schools (including private/parochial schools, vocational-technical schools, and also public schools which are not Regional School District #13 public schools such as public schools in other towns and magnet schools).* Obviously, when more Durham and Middlefield resident students attend nonpublic schools, fewer students attend RSD 13 public schools and vice versa.

From the review of nonpublic school enrollment growth trends shown in Appendix 2-8a through 2-10b and Figures 2-12 through 2-14 below, several important observations can be made:

K-4: A very small percentage (on average 31 elementary school children or 3% of all K-4 children in the regional school district) attended nonpublic schools during the past ten years. According to Fig. 2-12, 3.9% (42 students) were attending nonpublic schools in 2002, then the percentage almost halved to 2.1% (22 students) in 2006, increasing back to 4.4% (41 students) in 2011. In short, although the number of elementary school students in private and parochial schools remained at about 40 students, because the total public school enrollments have been declining, the percentage in nonpublic schools increased even in the years of economic difficulty, 2009 and 2010.

* In this report we are using 'nonpublic' and 'non-local' interchangeably. But strictly speaking the use of non-local schools or enrollments is correct because the latter term includes a small number of students attending public schools other than the RSD 13 public schools.

FIG. 2-12
REGIONAL SCHOOL DISTRICT 13 RESIDENTS ATTENDING K-4
NONPUBLIC SCHOOLS, 2002-2010



5-8: The percent of grades 5-8 resident students attending nonpublic schools declined from 8.9% in 2002 to 5.8% in 2010, indicating that compared to the elementary school students, a higher percent of middle school students were enrolled at nonpublic schools: note that the number of nonpublic middle school students has declined from 53 students in 2003 to 33 students in 2010, while RSD 13 *public* school enrollments remained more or less the same during the past nine years so that the percent of middle school students in private/parochial schools has declined from 9.0% in 2003 to 5.8% in 2010. This decrease in nonpublic school enrollment implies that poor economic conditions might have adversely affected the percent of middle school students attending private/parochial middle schools.**

9-12: A fairly large percentage of Regional School District residents attend nonpublic high schools and the percentage has been increasing during the past ten years from 19.5% (139 students) in 2002 to 27.1% (201 students) in 2008 with a very slight decline to 26.5% (205 students) in 2010. It appears that a very high portion of Regional School District #13's high school students are attending nonpublic high schools compared to students in other school districts in Connecticut.***

---

* As shown below, the percent of grades 5-8 students (NP58(T)) in nonpublic schools is negatively correlated to the Connecticut (UCT) and Middlefield (UM) unemployment rates.

NP58(T) = 13.94613 - 0.935101 UM(-1) - 30.657841UCT(-1) 2002-2011
(20.06) (-7.50) (-7.12)
$\overline{R^2}$ (Bar Squared) = 0.920 SEE = 0.367 D.W. = 2.91 MVD = 7.344

On the other hand, both nonpublic school enrollments for grades K-4 and grades 9-12 students are not significantly affected by unemployment rates.

** Out of 50 'nonlocal' enrollments in 2002, 23 students attended nonlocal *public* schools, thus 27 students were in private/parochial schools. This trend persisted until 2007, but the number of students enrolled in nonlocal public schools dropped sharply to 15 students in 2008, and further to 8 students in 2010.

*** Note that roughly 50 students attended vocational-technical schools in 2002 through 2010.

FIG. 2-13
GRADE 5-8 STUDENTS IN NONPUBLIC SCHOOLS

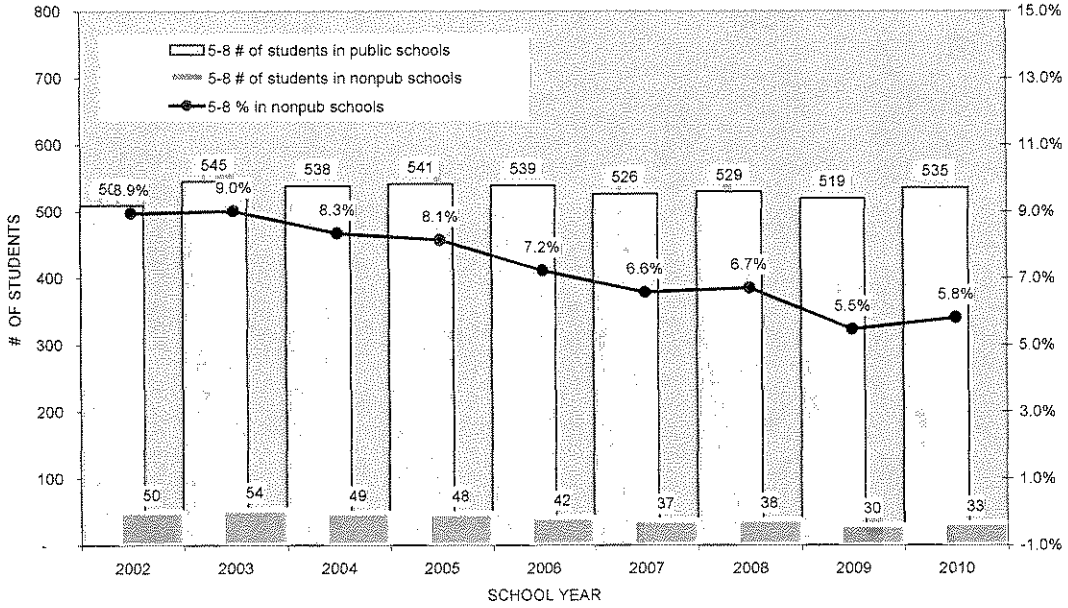
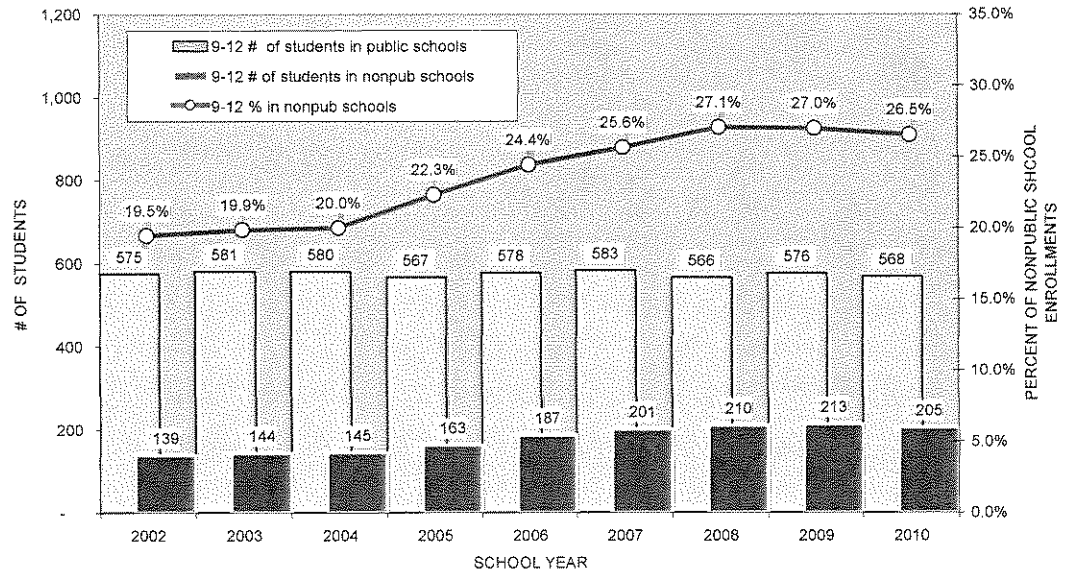
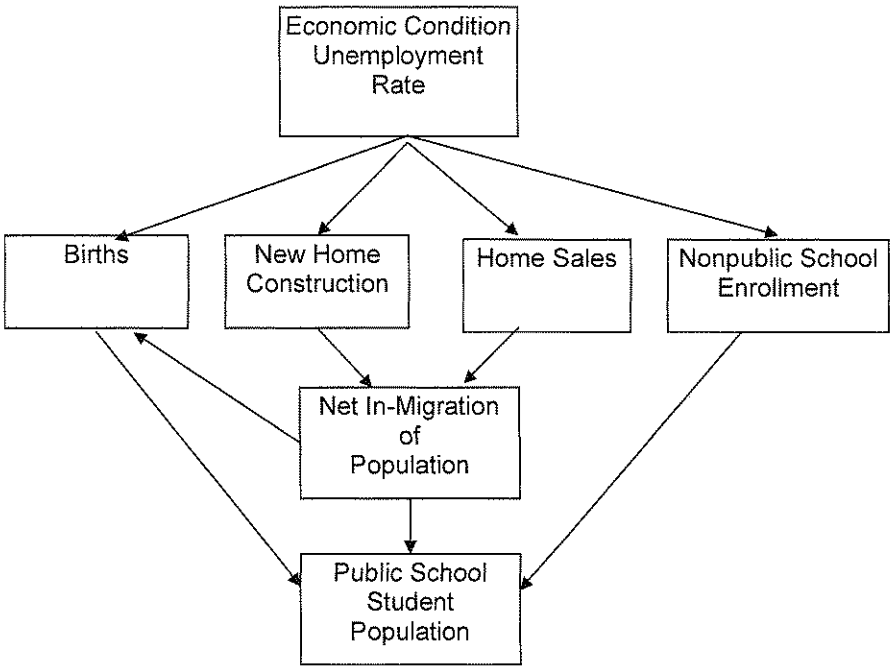


FIG. 2-14
PUBLIC AND NONPUBLIC HIGH SCHOOL ENROLLMENTS
REGIONAL SCHOOL DISTRICT #13, 2002-2010



2.11 Concluding Observations

In this section, it was demonstrated that family decisions are greatly affected by the parents' sense of economic security and well-being.* Accordingly, it was found that the unemployment rate turned out to be the underlying factor that regulated the four major factors (births, new home construction, home sales, and nonpublic school enrollments), which in turn influenced enrollments in public schools.



For example, a low unemployment rate in an area increases the number of births, which in turn enlarges the kindergarten enrollment five years later. At the same time, a low unemployment rate boosts new home construction and home sales, bringing more families with children (an increase in net in-migration) into the district, and adding yet more children to the public schools. However, the low unemployment rate would also encourage more families to send their children to private schools, thus reducing the public school enrollments. According to the Family Cycle Model,** what happens in one year will have long-term multi-year effects on school enrollments. The size of the public school student population at a given year is therefore a cumulative result of events taking place in all previous years.

* Of course, besides jobs there are other factors that contribute to the economic security of households. They include changes in real income (adjusted by the inflation rate) and real wealth (such as home price or values, savings, stocks and bonds, etc.). Recently these factors were also highly volatile contributing to our insecurity.

** See Appendix 2-B for a description of the Family Cycle Model developed by HCPC, Inc.

APPENDIX 2-A
REGRESSION CONCEPTS AND TERMINOLOGY

Regression Equation: A method of Least Squares is used. This method develops an equation that relates one variable (such as enrollment) to one or more other variables (such as births, unemployment rate, etc.) that should explain the first variable. This method is mathematically derived so that the resulting combination of explanatory variables produces the smallest error between the historic actual values and those estimated by the regression.

R Squared: R^2 is the best-known indicator of the success of a regression equation's fit. The R squared measures the percentage of the change in the dependent variable, which the equation explains by changes in the explanatory variables.

$\bar{R}^2$ "R bar squared: $\bar{R}^2$ is the R-squared adjusted for degrees of freedom

Standard Error of the Estimates: The S.E.E. gives a measure of how close the fitted values are to the actual values from the past. When a regression analysis is being used to develop an equation, it is desirable to have as small an S.E.E. as possible. In addition, these statistics may be used to gain some idea of the degree of forecasting accuracy that can be expected.

T-Ratio: The t-ratio shows the significance of each explanatory variable in predicting the dependent variable. It is desirable to have as large (either positive or negative) a t-ratio as possible for each explanatory variable. Generally, any statistics greater than +2.0 or less than -2.0 is acceptable. The t-ratio is derived by dividing the estimated coefficient for a variable by its Standard Error.

Durbin-Watson Statistics: One principal assumption of regression analysis is that the errors (between the fitted and actual values) are independent from one observation to the next. That is, knowledge of the error in one year will not help us anticipate the error in the next year. Autocorrelation is the case where there is a correlation between successive errors. The D.W. Statistic provides the standard test for autocorrelation. Generally, if the D.W. Statistic is between 1.5 and 2.5, there is no serious autocorrelation in a regression equation.

APPENDIX 2-B
FAMILY CYCLE MODEL OF SCHOOL ENROLLMENT CHANGES

H. C. Planning Consultants (HCPC) has developed a unique model called the Family Cycle Model. The *Family Cycle* ™ Model is based on the premise that the enrollment impact of a residential unit on a town varies from year to year. This variation over time in the number of schoolchildren living in the unit is determined by the composition of the family living in the unit, which is determined in turn by the family's length of residence in the unit. Through surveys of various towns, it was found that the average number of schoolchildren contributed by a household varies depending on the number of years that the household has lived in the town. In general, the changing pattern of schoolchildren produced per residence can be represented by a bell curve showing fewer schoolchildren in the early period of a household's residence in a town, and a greater number of children after 8 to 12 years of residency. This bell curve describes a family's life cycle: when a young family moves into a town, it has one or two pre-school children; the children then attend an elementary school, middle and a high school, before leaving for college or independent life. A survey of Regional School District #13 households was not conducted to obtain the multi-year enrollment multipliers for this study, but it may be conducted if such a survey is deemed necessary in the future.

SECTION 2

APPENDIX TABLES

APPENDIX TABLE 2.1
BIRTHS TO DURHAM AND MIDDLEFIELD RESIDENTS
1975-2011

Year	Births to Durham Residents, State Data (1)	Births to Middlefield Residents, State Data (3)	Births to Both Towns (State Data) (5)	National Unemp-loyment Rate N.S.A. (6)	State Unemp-loyment Rate N.S.A. (7)	Durham Unemp-loyment Rate N.S.A. (8)	Middlefield Unemp-loyment Rate N.S.A. (9)
History:					%	%	
1975	53	32	85	8.5	7.0	7.1	8.1
1976	53	33	86	7.7	5.2	4.3	5.9
1977	60	39	99	7.1	5.1	3.9	6.3
1978	51	33	**84**	6.1	5.9	4.8	6.9
1979	64	42	106	5.8	6.2	5.2	6.7
1980	50	38	88	7.1	5.9	5.6	8.2
1981	65	35	100	7.6	6.0	4.8	5.3
1982	49	36	85	9.7	6.9	3.9	4.1
1983	57	40	97	9.6	5.9	3.6	3.3
1984	67	50	117	7.5	4.5	2.9	2.5
1985	61	44	105	7.2	4.6	2.1	2.6
1986	75	40	115	7	3.8	2.1	1.9
1987	63	57	120	6.2	3.2	2.5	2.9
1988	85	51	136	5.5	2.9	3.8	3.7
1989	69	53	122	5.3	3.6	5.5	6
1990	78	55	133	5.6	4.9	6.4	6.1
1991	70	37	107	6.8	6.5	5.6	2.9
1992	78	**59**	**137**	7.5	7.3	4.8	4.9
1993	61	50	111	6.9	6.4	4.6	5.7
1994	75	42	117	6.1	5.5	5.7	5.4
1995	75	45	120	5.6	5.3	4.6	5
1996	85	36	121	5.4	5.3	2.5	3.4
1997*	76	38	114	4.9	4.8	2.1	2.6
1998*	75	41	116	4.5	3.3	1.7	1.8
1999	**86**	40	126	4.2	2.7	2.6	3.2
2000	80	46	126	4	2.3	3.2	3.6
2001	80	45	125	4.7	3.1	4.5	4.8
2002	68	52	120	5.8	4.4	4	4
2003	74	41	115	6	5.5	3.5	5.2
2004	85	46	131	5.5	4.9	3.4	3.0
2005	61	41	102	5.1	4.6	3.3	4.4
2006	54	41	95	4.6	4.4	3.3	3.9
2007	80	45	125	4.6	4.6	3.3	4.2
2008	61	31	92	5.8	5.6	3.9	4.7
2009	60	19	**79**	9.3	8.3	5.9	6.9
2010	52	34	86	9.6	9.1	6.3	7.6
2011	56	31	87	8.9	8.8	6.9	7.2

Sources: Column (1) and (2): Connecticut Department of Public Health; * 1997 and 1998 Data are estimates based on the birth registration data obtained from Middlefield and Durham Town Clerks. Columns (6), National Bureau of Economics; (7), (8)and (9): Connecticut Department of Labor.

APPENDIX TABLE 2.2
NEW DWELLING UNITS BUILT
DURHAM, CONNECTICUT 1980-2011

Calendar Year	New Housing Units Built Jan.-Dec State Data (1)	Housing Units Net Gain (2)	Total Housing Units (3)	Durham K-12 Enrollment (4)	Durham K-12 Enrollment Per H.U. (5)
1980	22	22	1579	--	--
1981	8	7	1601	--	--
1982	22	21	1619	--	--
1983	23	23	1642	--	--
1984	55	55	1697	--	--
1985	74	75	1,771	--	--
1986	42	42	1814	--	--
1987	103	101	1915	--	--
1988	61	61	1976	--	--
1989	26	26	2002	--	--
1990	24	23	2025	--	--
1991	31	31	1958	--	--
1992	36	35	1993	--	--
1993	61	60	2053	--	--
1994	45	45	2098	--	--
1995	45	45	2143	--	--
1996	24	24	2167	--	--
1997	46	45	2212	--	--
1998	43	39	2251	--	--
1999	58	58	2309	--	--
2000	63	60	2369	--	--
2001	46	46	2395	1342	0.560
2002	55	55	2450	1371	0.560
2003	46	46	2496	1390	0.557
2004	46	46	2542	1418	0.558
2005	47	47	2589	1413	0.546
2006	38	38	2627	1409	0.536
2007	31	31	2658	1376	0.518
2008	5	3	2661	1381	0.519
2009	6	2	2663	1344	0.505
2010	6	4	2667	1329	0.498
2011	4	4	2671	1297	0.486

Source: 1970, 1980, and 1990 figures are decennial U. S. Census data. The remaining data are estimated using the number of permits reported to the Connecticut Department of Housing.

APPENDIX TABLE 2.3
NEW DWELLING UNITS BUILT
MIDDLEFIELD, CONNECTICUT 1980-2011

Calendar Year	New Housing Units Built Jan.-Dec State Data (1)	Housing Units Net Gain (2)	Total Housing Units (3)	Middlefield K-12 Enrollment (4)	Middlefield K-12 Enrollment Per H.U. (5)
1980	8	7	1477	--	--
1981	13	13	1490	--	--
1982	10	10	1520	--	--
1983	12	12	1532	--	--
1984	13	13	1545	--	--
1985	22	22	1567	--	--
1986	47	47	1614	--	--
1987	34	33	1647	--	--
1988	18	18	1665	--	--
1989	13	12	1677	--	--
1990	7	7	1,684	--	--
1991	11	11	1,598	--	--
1992	10	9	1,607	--	--
1993	14	13	1,620	--	--
1994	17	17	1,637	--	--
1995	16	16	1,653	--	--
1996	13	13	1,666	--	--
1997	19	17	1,683	--	--
1998	18	15	1,698	--	--
1999	26	24	1,722	--	--
2000	15	15	1,737	--	--
2001	7	7	1,747	727	0.416
2002	12	12	1,759	736	0.418
2003	14	14	1,773	734	0.414
2004	9	9	1,782	728	0.409
2005	7	5	1,787	721	0.403
2006	4	4	1,791	721	0.403
2007	7	6	1,797	727	0.405
2008	1	1	1,798	704	0.392
2009	1	-2	1,796	713	0.397
2010	7	7	1,803	691	0.383
2011	4	4	1,807	664	0.367

Source: 1970, 1980, and 1990 figures are decennial U. S. Census data. The remaining data are estimated using the number of permits reported to the Connecticut Department of Housing.
NA = Not available * Single-Family units only.

APPENDIX TABLE 2.4
NEW DWELLING UNITS BUILT
REGIONAL SCHOOL DISTRICT 13, CONNECTICUT 1980-2011

Calendar Year	Durham Housing Net Gain (1)	Middlefield Housing Net Gain (2)	Region 13 Housing Net Gain (3)	Region 13 Total Housing Units (4)	Reg. 13 K-12 Public School Enrollment (5)	Region 13 Public School Children Per Unit (6)	CT Unemp. Rate (7)
1980	22	7	29	3056	--	--	5.9
1981	7	13	20	3091	--	--	6.0
1982	21	10	31	3139	--	--	6.9
1983	23	12	35	3174	--	--	5.9
1984	55	13	68	3242	1529	0.472	4.5
1985	75	22	97	3338	1513	0.453	4.6
1986	42	47	89	3428	1497	0.437	3.8
1987	101	33	134	3562	1481	0.416	3.2
1988	61	18	79	3641	1455	0.400	2.9
1989	26	12	38	3679	1499	0.407	3.6
1990	23	7	30	3709	1544	0.416	4.9
1991	31	11	42	3556	1601	0.450	6.5
1992	35	9	44	3600	1662	0.462	7.3
1993	60	13	73	3673	1750	0.476	6.4
1994	45	17	62	3735	1822	0.488	5.5
1995	45	16	61	3796	1810	0.477	5.3
1996	24	13	37	3833	1852	0.483	5.3
1997	45	17	62	3895	1886	0.484	4.8
1998	39	15	54	3949	1920	0.486	3.3
1999	58	24	82	4031	1949	0.484	2.7
2000	60	15	75	4106	2009	0.489	2.3
2001	46	7	53	4142	2068	0.499	3.1
2002	55	12	67	4209	2107	0.501	4.4
2003	46	14	60	4269	2124	0.498	5.5
2004	46	9	55	4324	2146	0.496	4.9
2005	47	5	52	4376	2134	0.489	4.6
2006	38	4	42	4418	2130	0.487	4.4
2007	31	6	37	4455	2103	0.472	4.6
2008	3	1	4	4459	2085	0.468	5.6
2009	2	-2	0	4459	2057	0.461	8.3
2010	4	7	11	4470	2020	0.453	9.1
2011	4	4	8	4514	1961	0.436	8.8

Source: 1970, 1980, and 1990 figures are decennial U. S. Census data. The remaining data are estimated using the number of permits reported to the Connecticut Department of Housing.

Col. (7) = Col. (6) / Col. (5).

APPENDIX TABLE 2.5

ANNUAL HOME SALES IN DURHAM, MIDDLEFIELD IN

REGIONAL SCHOOL DISTRICT #13

1988-2011

	Durham			Middlefield				Region 13		
	1-Fam	Condo	All	1-Fam	Condo	All		1-Fam	Condo	All
1988	1	10	11	26		26	1988	27	10	37
1989	8	2	10	27	5	32	1989	35	7	42
1990	37	5	42	25	4	29	1990	62	9	71
1991	23		23	29	1	30	1991	52	1	53
1992	38	3	41	30	2	32	1992	68	5	73
1993	41	1	42	23	7	30	1993	64	8	72
1994	58	1	59	31	2	33	1994	89	3	92
1995	70	2	72	30	4	34	1995	100	6	106
1996	53	6	59	34	2	36	1996	87	8	95
1997	66	13	79	45	2	47	1997	111	15	126
1998	60	2	62	38	6	44	1998	98	8	106
1999	108	4	112	52	2	54	1999	160	6	166
2000	94	8	102	52	2	54	2000	146	10	156
2001	76	10	86	61	4	65	2001	137	14	151
2002	98	10	108	53	2	55	2002	151	12	163
2003	79	7	86	53	7	60	2003	132	14	146
2004	89	6	95	56	4	60	2004	145	10	155
2005	94	7	101	54	6	60	2005	148	13	161
2006	96	8	104	52	2	54	2006	148	10	158
2007	83	9	92	42	6	48	2007	125	15	140
2008	70	7	77	49	9	58	2008	119	16	135
2009	60	2	62	30	4	34	2009	90	6	96
2010	57	8	65	25	3	28	2010	82	11	93
2011	36	3	39	32	4	36	2011	68	7	75
Averages:										
3-Yr.	51	4	55	29	4	33		80	8	88
5-Yr	61	6	67	36	5	41		97	11	108
10-Yr	76	7	83	45	5	49		121	11	132
W. 3-Yr	47	5	52	29	4	33		76	8	85
W. 5-Yr.	54	5	59	33	5	37		87	10	96

Source: The Warren Group Town Stat Data.

APPENDIX TABLE 2.6

MEDIAN HOME SALES PRICE IN DURHAM AND MIDDLEFIELD IN CONNECTICUT

1988-2011

	Durham		Middlefield	
	1-Fam	Condo	1-Fam	Condo
1988	-	$105,900	$147,250	-
1989	$178,500	-	$146,500	$185,000
1990	$161,000	$110,900	$134,000	$120,950
1991	$190,100	-	$138,500	-
1992	$185,750	$115,000	$135,000	-
1993	$165,000	-	$124,000	$134,000
1994	$154,950	-	$125,000	-
1995	$173,600	-	$140,750	$148,000
1996	$184,000	$189,900	$130,000	-
1997	$168,000	$164,500	$130,000	-
1998	$195,500	-	$141,750	$139,750
1999	$211,450	$86,500	$157,500	-
2000	$215,000	$189,160	$161,500	-
2001	$225,500	$183,413	$165,000	$166,500
2002	$272,000	$177,740	$175,000	-
2003	$300,000	$156,000	$225,000	$160,000
2004	$320,000	$234,950	$243,750	$200,000
2005	$312,500	$284,900	$268,000	$248,250
2006	$345,950	$292,500	$256,500	-
2007	$330,000	$147,000	$280,000	$253,000
2008	$320,000	$128,000	$271,000	$245,000
2009	$274,500	-	$260,000	$225,000
2010	$317,000	$259,900	$240,000	$434,818
2011	$299,900		$219,950	$150,000

Source: The Warren Group Town Stat Data.

APPENDIX TABLE 2.7
ANNUAL HOUSING TURNOVER RATE IN DURHAM AND MIDDLEFIELD
IN REGIONAL SCHOOL DISTRICT 13
1988-2011

	Durham			Middlefield			Regional S.D. 13		
	All	Total H.U.	Housing Turnover Rate	All	Total H.U.	Housing Turnover Rate	All	Total H.U.	Housing Turnover Rate
1988	11	1976	0.6%	26	1665	1.6%	11	1976	0.6%
1989	10	2002	0.5%	32	1677	1.9%	10	2002	0.5%
1990	19	2025	2.1%	29	1,684	1.7%	42	2025	2.1%
1991	23	1958	1.2%	30	1,598	1.9%	23	1958	1.2%
1992	41	1993	2.1%	32	1,607	2.0%	41	1993	2.1%
1993	42	2053	2.0%	30	1,620	1.9%	42	2053	2.0%
1994	59	2098	2.8%	33	1,637	2.0%	59	2098	2.8%
1995	72	2143	3.4%	34	1,653	2.1%	72	2143	3.4%
1996	59	2167	2.7%	36	1,666	2.2%	59	2167	2.7%
1997	79	2212	3.6%	47	1,683	2.8%	79	2212	3.6%
1998	62	2251	2.8%	44	1,698	2.6%	62	2251	2.8%
1999	112	2309	4.9%	54	1,722	3.1%	112	2309	4.9%
2000	102	2369	4.3%	54	1,737	3.1%	102	2369	4.3%
2001	86	2395	3.6%	65	1,747	3.7%	86	2395	3.6%
2002	108	2450	4.4%	55	1,759	3.1%	108	2450	4.4%
2003	86	2496	3.4%	60	1,773	3.4%	86	2496	3.4%
2004	95	2542	3.7%	60	1,782	3.4%	95	2542	3.7%
2005	101	2589	3.9%	60	1,787	3.4%	101	2589	3.9%
2006	104	2627	4.0%	54	1,791	3.0%	104	2627	4.0%
2007	92	2658	3.5%	48	1,797	2.7%	92	2658	3.5%
2008	77	2661	2.9%	58	1,798	3.2%	77	2661	2.9%
2009	62	2663	2.3%	34	1,796	1.9%	62	2663	2.3%
2010	65	2667	2.4%	28	1,803	1.6%	65	2667	2.4%
2011	39	2706	1.4%	36	1,939	1.9%	75	2742	2.7%

Source: H. C. Planning Consultants, Inc.

APPENDIX TABLE 2.8
DURHAM RESIDENT PUPILS ATTENDING NONPUBLIC SCHOOLS BY GRADE
2002-2010 (AS OF JANUARY)

		PK	K	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
2002	Local Public	7	104	104	116	111	99	124	117	117	95	99	95	104	86
	Non-local Public	0	0	0	0	0	0	0	10	3	2	0	0	2	1
	Voc-Tech											4	3	10	9
	Private/Parochial	4	5	6	2	5	3	7	6	5	4	17	15	20	9
	Non-Local Total	4	5	6	2	5	3	7	16	8	6	21	18	32	19
	TOTAL	11	109	110	118	116	102	131	133	125	101	120	113	136	105
	% NON-LOCAL	36.4%	4.6%	5.5%	1.7%	4.3%	2.9%	5.3%	12.0%	6.4%	5.9%	17.5%	15.9%	23.5%	18.1%
2003	Local Public	17	95	117	104	119	116	102	122	120	119	86	90	95	105
	Non-local Public	0	0	0	0	0	0	0	5	7	2	0	1	1	2
	Voc-Tech											8	5	3	8
	Private/Parochial	1	1	2	6	2	4	5	6	8	4	14	18	13	19
	Non-Local Tot	1	1	2	6	2	4	5	11	15	6	22	24	17	29
	TOTAL	18	96	119	110	121	120	107	133	135	125	108	114	112	134
	% NON-LOCAL	5.6%	1.0%	1.7%	5.5%	1.7%	3.3%	4.7%	8.3%	11.1%	4.8%	20.4%	21.1%	15.2%	21.6%
2004	Local Public	27	106	107	124	108	128	121	107	123	121	103	84	87	99
	Non-local Public	0	0	0	0	0	1	0	1	6	6	1	0	0	2
	Voc-Tech											8	8	6	1
	Private/Parochial	5	1	0	2	3	4	3	5	6	8	17	13	19	13
	Non-Local Tot	5	1	0	2	3	5	3	6	12	14	26	21	25	16
	TOTAL	32	107	107	126	111	133	124	113	135	135	129	105	112	115
	% NON-LOCAL	15.6%	0.9%	0.0%	1.6%	2.7%	3.8%	2.4%	5.3%	8.9%	10.4%	20.2%	20.0%	22.3%	13.9%
2005	Local Public	24	94	117	112	121	112	128	117	110	124	106	103	80	89
	Non-local Public	0	0	0	0	0	0	1	4	2	5	1	1	0	1
	Voc-Tech											11	7	6	6
	Private/Parochial	7	5	1	0	1	3	2	3	4	7	25	19	12	18
	Non-Local Tot	7	5	1	0	1	3	3	7	6	12	37	27	18	25
	TOTAL	31	99	118	112	122	115	131	124	116	136	143	130	98	114
	% NON-LOCAL	22.6%	5.1%	0.8%	0.0%	0.8%	2.6%	2.3%	5.6%	5.2%	8.8%	25.9%	20.8%	18.4%	21.9%
2006	Local Public	26	92	106	121	117	122	112	124	119	110	116	96	98	76
	Non-local Public	0	0	0	0	0	0	0	6	3	1	0	1	1	0
	Voc-Tech											8	8	7	6
	Private/Parochial	8	4	3	2	1	0	3	3	3	4	20	25	19	15
	Non-Local Tot	8	4	3	2	1	0	3	9	6	5	28	34	27	21
	TOTAL	34	96	109	123	118	122	115	133	125	115	144	130	125	97
	% NON-LOCAL	23.5%	4.2%	2.8%	1.6%	0.8%	0.0%	2.6%	6.8%	4.8%	4.3%	19.4%	26.2%	21.6%	21.6%
2007	Local Public	27	82	102	104	121	119	119	106	123	119	86	111	94	90
	Non-local Public	1	0	0	0	0	0	0	7	7	1	0	0	1	3
	Voc-Tech											4	8	8	6
	Private/Parochial	3	5	4	3	1	0	1	4	6	6	33	21	23	19
	Non-Local Tot	4	5	4	3	1	0	1	11	13	7	37	29	32	28
	TOTAL	31	87	106	107	122	119	120	117	136	126	123	140	126	118
	% NON-LOCAL	12.9%	5.7%	3.8%	2.8%	0.8%	0.0%	0.8%	9.4%	9.6%	5.6%	30.1%	20.7%	25.4%	23.7%
2008	Local Public	23	104	99	109	104	117	123	117	105	127	95	87	109	85
	Non-local Public	0	0	0	0	0	0	0	2	6	3	0	1	0	3
	Voc-Tech											6	4	8	6
	Private/Parochial	5	3	2	4	4	1	0	2	5	6	29	31	21	27
	Non-Local Total	5	3	2	4	4	1	0	4	11	9	35	36	29	36
	TOTAL	28	107	101	113	108	118	123	121	116	136	130	123	138	121
	% NON-LOCAL	17.9%	2.8%	2.0%	3.5%	3.7%	0.8%	0.0%	3.3%	9.5%	6.6%	26.9%	29.3%	21.0%	29.8%
2009	Local Public	12	64	116	103	113	101	118	118	117	107	106	92	86	103
	Non-local Public	0	0	0	0	0	0	0	2	1	5	0	0	0	0
	Voc-Tech											11	6	4	7
	Private/Parochial	5	5	3	5	4	5	3	0	4	6	20	28	32	25
	Non-Local Total	5	5	3	5	4	5	3	2	5	11	31	34	36	32
	TOTAL	17	69	119	108	117	106	121	120	122	118	137	126	122	135
	% NON-LOCAL	29.4%	7.2%	2.5%	4.6%	3.4%	4.7%	2.5%	1.7%	4.1%	9.3%	22.6%	27.0%	29.5%	23.7%
2010	Local Public	18	79	75	114	105	123	106	114	118	114	89	107	98	81
	Non-local Public	0	0	0	0	0	0	0	5	0	1	1	0	1	1
	Voc-Tech											4	10	4	4
	Private/Parochial	4	4	5	5	5	4	7	3	1	5	28	17	35	35
	Non-Local Total	4	4	5	5	5	4	7	8	1	6	33	27	40	40
	TOTAL	22	83	80	119	110	127	113	122	119	120	122	134	138	121
	% NON-LOCAL	18.2%	4.8%	6.3%	4.2%	4.5%	3.1%	6.2%	6.6%	0.8%	5.0%	27.0%	20.1%	29.0%	33.1%

* Nonpublic includes private/parochial school students.
Source: Prepared by HCPC, Inc. based on the data obtained from the Connecticut State Department of Education (CSDE).

APPENDIX TABLE 2-9
DURHAM RESIDENT PUPILS ATTENDING NONPUBLIC SCHOOLS BY GRADE LEVEL
2002-2010

		K-4	5-8	9-12	K-12	PK-12
2002	Local Public	534	453	384	1371	1378
	Non-local Public	0	15	3	18	18
	Voc-Tech	0	0	26	26	26
	Private/Parochial	28	15	61	104	108
	Non-Local Total	28	30	90	148	152
	TOTAL	562	483	474	1519	1530
	% NON-LOCAL	5.0%	6.2%	19.0%	9.7%	9.9%
2003	Local Public	551	463	376	1390	1407
	Non-local Public	0	14	4	18	18
	Voc-Tech	0	0	24	24	24
	Private/Parochial	20	18	64	102	103
	Non-Local Total	20	32	92	144	145
	TOTAL	571	495	468	1534	1552
	% NON-LOCAL	3.5%	6.5%	19.7%	9.4%	9.3%
2004	Local Public	573	472	373	1418	1445
	Non-local Public	1	13	3	17	17
	Voc-Tech	0	0	23	23	23
	Private/Parochial	13	19	62	94	99
	Non-Local Total	14	32	88	134	139
	TOTAL	587	504	461	1552	1584
	% NON-LOCAL	2.4%	6.3%	19.1%	8.6%	8.8%
2005	Local Public	556	479	378	1413	1437
	Non-local Public	1	11	3	15	15
	Voc-Tech	0	0	30	30	30
	Private/Parochial	12	14	74	100	107
	Non-Local Total	13	25	107	145	152
	TOTAL	569	504	485	1558	1589
	% NON-LOCAL	2.3%	5.0%	22.1%	9.3%	9.6%
2006	Local Public	558	465	386	1409	1435
	Non-local Public	0	10	2	12	12
	Voc-Tech	0	0	29	29	29
	Private/Parochial	13	10	79	102	110
	Non-Local Total	13	20	110	143	151
	TOTAL	571	485	496	1552	1586
	% NON-LOCAL	2.3%	4.1%	22.2%	9.2%	9.5%
2007	Local Public	528	467	381	1376	1403
	Non-local Public	0	15	4	19	20
	Voc-Tech	0	0	26	26	26
	Private/Parochial	14	16	96	126	129
	Non-Local Tot	14	31	126	171	175
	TOTAL	542	498	507	1547	1578
	% NON-LOCAL	2.6%	6.2%	24.9%	11.1%	11.1%
2008	Local Public	533	472	376	1381	1404
	Non-local Public	0	11	4	15	15
	Voc-Tech	0	0	24	24	24
	Private/Parochial	14	13	108	135	140
	Non-Local Total	14	24	136	174	179
	TOTAL	547	496	512	1555	1583
	% NON-LOCAL	2.6%	4.8%	26.6%	11.2%	11.3%
2009	Local Public	497	460	387	1344	1356
	Non-local Public	0	8	0	8	8
	Voc-Tech	0	0	28	28	28
	Private/Parochial	25	10	105	140	145
	Non-Local Total	25	18	133	176	181
	TOTAL	522	478	520	1520	1537
	% NON-LOCAL	4.8%	3.8%	25.6%	11.6%	11.8%
2010	Local Public	496	452	375	1323	1341
	Non-local Public	0	6	3	9	9
	Voc-Tech	0	0	22	22	22
	Private/Parochial	30	9	115	154	158
	Non-Local Total	30	15	140	185	189
	TOTAL	526	467	515	1508	1530
	% NON-LOCAL	5.7%	3.2%	27.2%	12.3%	12.4%

* Nonpublic includes private/parochial school students.
Source: Prepared by HCPC, Inc. based on the data obtained from the Connecticut State Department of Education (CSDE). The number of public school enrollments provided by the CSDE may slightly differ from corresponding figures provided by Regional School District #13 Public Schools.

APPENDIX TABLE 2.10
MIDDLEFIELD RESIDENT PUPILS ATTENDING NONPUBLIC SCHOOLS BY GRADE
2002-2010 (AS OF OCTOBER)

		PK	K	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
2002	Local Public	6	44	60	67	52	73	69	49	71	60	48	51	49	43
	Non-local Public	0	0	0	0	0	0	0	3	1	4	1	2	1	1
	Voc-Tech											3	5	3	7
	Private/Parochial	1	3	2	2	1	3	3	2	7	3	6	6	10	4
	Non-Local Total	1	3	2	2	1	3	3	5	8	7	10	13	14	12
	TOTAL	7	47	62	69	53	76	72	54	79	67	58	64	63	55
	% NON-LOCAL	14.3%	6.4%	3.2%	2.9%	1.9%	3.9%	4.2%	9.3%	10.1%	10.4%	17.2%	20.3%	22.2%	21.8%
2003	Local Public	12	51	51	58	64	54	67	63	50	71	57	50	50	48
	Non-local Public	0	0	0	0	0	0	0	5	3	2	0	1	0	0
	Voc-Tech											6	5	3	4
	Private/Parochial	4	0	2	3	1	2	2	5	1	6	10	4	8	11
	Non-Local Tot	4	0	2	3	1	2	2	10	4	8	16	10	11	15
	TOTAL	16	51	53	61	65	56	69	73	54	79	73	60	61	63
	% NON-LOCAL	25.0%	0.0%	3.8%	4.9%	1.5%	3.6%	2.9%	13.7%	7.4%	10.1%	21.9%	16.7%	18.0%	23.8%
2004	Local Public	8	54	49	55	56	64	56	69	66	52	59	50	48	50
	Non-local Public	0	0	0	0	0	0	0	4	3	4	0	1	2	0
	Voc-Tech											10	5	5	4
	Private/Parochial	4	2	0	3	2	0	2	1	5	0	10	8	4	8
	Non-Local Tot	4	2	0	3	2	0	2	5	8	4	20	14	11	12
	TOTAL	12	56	49	58	58	64	58	74	74	56	79	64	59	62
	% NON-LOCAL	33.3%	3.6%	0.0%	5.2%	3.4%	0.0%	3.4%	6.8%	10.8%	7.1%	25.3%	21.9%	18.6%	19.4%
2005	Local Public	12	47	66	50	57	58	64	56	67	67	39	59	47	44
	Non-local Public	0	0	0	0	0	0	0	3	3	4	0	0	0	1
	Voc-Tech											10	5	5	4
	Private/Parochial	1	3	2	2	5	2	1	4	3	6	4	12	11	4
	Non-Local Tot	1	3	2	2	5	2	1	7	6	10	14	17	16	9
	TOTAL	13	50	68	52	62	60	65	63	73	77	53	76	63	53
	% NON-LOCAL	7.7%	6.0%	2.9%	3.8%	8.1%	3.3%	1.5%	11.1%	8.2%	13.0%	26.4%	22.4%	25.4%	17.0%
2006	Local Public	8	59	46	66	52	59	61	63	57	66	48	37	62	45
	Non-local Public	0	0	0	0	0	0	0	3	4	4	0	0	0	3
	Voc-Tech											6	8	8	3
	Private/Parochial	0	1	2	1	2	3	0	2	4	5	21	5	12	11
	Non-Local Tot	0	1	2	1	2	3	0	5	8	9	27	13	20	17
	TOTAL	8	60	48	67	54	62	61	68	65	75	75	50	82	62
	% NON-LOCAL	0.0%	1.7%	4.2%	1.5%	3.7%	4.8%	0.0%	7.4%	12.3%	12.0%	36.0%	26.0%	24.4%	27.4%
2007	Local Public	9	49	66	48	65	55	64	60	59	59	59	47	39	57
	Non-local Public	0	0	0	0	0	0	0	2	1	2	1	1	0	1
	Voc-Tech											5	6	7	6
	Private/Parochial	2	0	3	2	2	2	4	0	1	0	14	19	4	11
	Non-Local Tot	2	0	3	2	2	2	4	2	2	2	20	26	11	18
	TOTAL	11	49	69	50	67	57	68	62	61	61	79	73	50	75
	% NON-LOCAL	18.2%	0.0%	4.3%	4.0%	3.0%	3.5%	5.9%	3.2%	3.3%	3.3%	25.3%	35.6%	22.0%	24.0%
2008	Local Public	15	45	54	64	50	70	51	62	61	57	48	57	48	37
	Non-local Public	0	0	0	0	0	0	0	2	0	2	3	2	0	3
	Voc-Tech											6	4	6	6
	Private/Parochial	3	0	0	3	2	4	3	5	4	1	9	12	18	5
	Non-Local Tot	3	0	0	3	2	4	3	7	4	3	18	18	24	14
	TOTAL	18	45	54	67	52	74	54	69	65	60	66	75	72	51
	% NON-LOCAL	16.7%	0.0%	0.0%	4.5%	3.8%	5.4%	5.6%	10.1%	6.2%	5.0%	27.3%	24.0%	33.3%	27.5%
2009	Local Public	13	54	52	55	65	52	69	55	63	59	44	46	55	44
	Non-local Public	0	0	1	0	0	0	0	0	1	0	0	3	0	1
	Voc-Tech											13	7	3	5
	Private/Parochial	1	1	1	0	3	2	7	3	3	5	8	9	12	19
	Non-Local Tot	1	1	2	0	3	2	7	3	4	5	21	19	15	25
	TOTAL	14	55	54	55	68	54	76	58	67	64	65	65	70	69
	% NON-LOCAL	7.1%	1.8%	3.7%	0.0%	4.4%	3.7%	9.2%	5.2%	6.0%	7.8%	32.3%	29.2%	21.4%	36.2%
2010	Local Public	8	46	56	48	56	60	43	71	54	64	52	46	45	50
	Non-local Public	0	0	0	0	0	0	0	1	0	1	0	0	2	1
	Voc-Tech											2	10	7	3
	Private/Parochial	0	0	2	1	1	3	4	6	5	5	12	9	9	10
	Non-Local Tot	0	0	2	1	1	3	4	7	5	6	14	19	18	14
	TOTAL	8	46	58	49	57	63	47	78	59	70	66	65	63	64
	% NON-LOCAL	0.0%	0.0%	3.4%	2.0%	1.8%	4.8%	8.5%	9.0%	8.5%	8.6%	21.2%	29.2%	28.6%	21.9%

Source: Prepared by HCPC, Inc. based on the data obtained from the Connecticut State Department of Education (CSDE).

APPENDIX TABLE 2-11
MIDDLEFIELD RESIDENT PUPILS ATTENDING NONPUBLIC SCHOOLS BY GRADE LEVEL
2002-2010

		K-4	5-8	9-12	K-12	
2002	Local Public	296	249	191	736	742
	Non-local Public	0	8	5	13	13
	Voc-Tech	0	0	18	18	18
	Private/Parochial	14	12	26	52	53
	Non-Local Total	14	20	49	83	84
	TOTAL	310	269	240	819	826
	% NON-LOCAL	4.5%	7.4%	20.4%	10.1%	10.2%
2003	Local Public	278	251	205	734	746
	Non-local Public	0	10	1	11	11
	Voc-Tech	0	0	18	18	18
	Private/Parochial	10	12	33	55	59
	Non-Local Total	10	22	52	84	88
	TOTAL	288	273	257	818	834
	% NON-LOCAL	3.5%	8.1%	20.2%	10.3%	10.6%
2004	Local Public	278	243	207	728	736
	Non-local Public	0	11	3	14	14
	Voc-Tech	0	0	24	24	24
	Private/Parochial	9	6	30	45	49
	Non-Local Total	9	17	57	83	87
	TOTAL	287	260	264	811	823
	% NON-LOCAL	3.1%	6.5%	21.6%	10.2%	10.6%
2005	Local Public	278	254	189	721	733
	Non-local Public	0	10	1	11	11
	Voc-Tech	0	0	24	24	24
	Private/Parochial	15	13	31	59	60
	Non-Local Total	15	23	56	94	95
	TOTAL	293	277	245	815	828
	% NON-LOCAL	5.1%	8.3%	22.9%	11.5%	11.5%
2006	Local Public	282	247	192	721	729
	Non-local Public	0	11	3	14	14
	Voc-Tech	0	0	25	25	25
	Private/Parochial	9	11	49	69	69
	Non-Local Total	9	22	77	108	108
	TOTAL	291	269	269	829	837
	% NON-LOCAL	3.1%	8.2%	28.6%	13.0%	12.9%
2007	Local Public	283	242	202	727	736
	Non-local Public	0	5	3	8	8
	Voc-Tech	0	0	24	24	24
	Private/Parochial	13	1	48	62	64
	Non-Local Tot	13	6	75	94	96
	TOTAL	296	248	277	821	832
	% NON-LOCAL	4.4%	2.4%	27.1%	11.4%	11.5%
2008	Local Public	283	231	190	704	719
	Non-local Public	0	4	8	12	12
	Voc-Tech	0	0	22	22	22
	Private/Parochial	12	10	44	66	69
	Non-Local Total	12	14	74	100	103
	TOTAL	295	245	264	804	822
	% NON-LOCAL	4.1%	5.7%	28.0%	12.4%	12.5%
2009	Local Public	278	246	189	713	726
	Non-local Public	1	1	4	6	6
	Voc-Tech	0	0	28	28	28
	Private/Parochial	14	11	48	73	74
	Non-Local Total	15	12	80	107	108
	TOTAL	293	258	269	820	834
	% NON-LOCAL	5.1%	4.7%	29.7%	13.0%	12.9%
2010	Local Public	266	232	193	691	699
	Non-local Public	0	2	3	5	5
	Voc-Tech	0	0	22	22	22
	Private/Parochial	11	16	40	67	67
	Non-Local Total	11	18	65	94	94
	TOTAL	277	250	258	785	793
	% NON-LOCAL	4.0%	7.2%	25.2%	12.0%	11.9%

Source: Prepared by HCPC, Inc. based on the data obtained from the Connecticut State Department of Education (CSDE).

APPENDIX TABLE 2.12

REGIONAL SCHOOL DISTRICT 13 RESIDENT PUPILS ATTENDING NONPUBLIC SCHOOLS BY GRADE, 2002-2010 (AS OF OCTOBER 1)

		PK	K	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
2002	Local Public	13	148	164	183	163	172	193	166	188	155	147	146	153	129
	Non-local Public	0	0	0	0	0	0	0	13	4	6	1	2	3	2
	Voc-Tech	0	0	0	0	0	0	0	0	0	0	7	8	13	16
	Private/Parochial	5	8	8	4	6	6	10	8	12	7	23	21	30	13
	Non-Local Total	5	8	8	4	6	6	10	21	16	13	31	31	46	31
	TOTAL	18	156	172	187	169	178	203	187	204	168	178	177	199	160
	% NON-LOCAL	27.8%	5.1%	4.7%	2.1%	3.6%	3.4%	4.9%	11.2%	7.8%	7.7%	17.4%	17.5%	23.1%	19.4%
2003	Local Public	29	146	168	162	183	170	169	185	170	190	143	140	145	153
	Non-local Public	0	0	0	0	0	0	0	10	10	4	0	2	1	2
	Voc-Tech	0	0	0	0	0	0	0	0	0	0	14	10	6	12
	Private/Parochial	5	1	4	9	3	6	7	11	9	10	24	22	21	30
	Non-Local Tot	5	1	4	9	3	6	7	21	19	14	38	34	28	44
	TOTAL	34	147	172	171	186	176	176	206	189	204	181	174	173	197
	% NON-LOCAL	14.7%	0.7%	2.3%	5.3%	1.6%	3.4%	4.0%	10.2%	10.1%	6.9%	21.0%	19.5%	16.2%	22.3%
2004	Local Public	35	160	156	179	164	192	177	176	189	173	162	134	135	149
	Non-local Public	0	0	0	0	0	1	0	5	9	10	1	1	2	2
	Voc-Tech	0	0	0	0	0	0	0	0	0	0	18	13	11	5
	Private/Parochial	9	3	0	5	5	4	5	6	11	8	27	21	23	21
	Non-Local Tot	9	3	0	5	5	5	5	11	20	18	46	35	36	28
	TOTAL	44	163	156	184	169	197	182	187	209	191	208	169	171	177
	% NON-LOCAL	20.5%	1.8%	0.0%	2.7%	3.0%	2.5%	2.7%	5.9%	9.6%	9.4%	22.1%	20.7%	21.1%	15.8%
2005	Local Public	36	141	183	162	178	170	192	173	177	191	145	162	127	133
	Non-local Public	0	0	0	0	0	0	1	7	5	9	1	1	0	2
	Voc-Tech	0	0	0	0	0	0	0	0	0	0	21	12	11	10
	Private/Parochial	8	8	3	2	6	5	3	7	7	13	29	31	23	22
	Non-Local Tot	8	8	3	2	6	5	4	14	12	22	51	44	34	34
	TOTAL	44	149	186	164	184	175	196	187	189	213	196	206	161	167
	% NON-LOCAL	18.2%	5.4%	1.6%	1.2%	3.3%	2.9%	2.0%	7.5%	6.3%	10.3%	26.0%	21.4%	21.1%	20.4%
2006	Local Public	34	151	152	187	169	181	173	187	176	176	164	133	160	121
	Non-local Public	0	0	0	0	0	0	0	9	7	5	0	1	1	3
	Voc-Tech	0	0	0	0	0	0	0	0	0	0	14	16	15	9
	Private/Parochial	8	5	5	3	3	3	3	5	7	9	41	30	31	26
	Non-Local Tot	8	5	5	3	3	3	3	14	14	14	55	47	47	38
	TOTAL	42	156	157	190	172	184	176	201	190	190	219	180	207	159
	% NON-LOCAL	19.0%	3.2%	3.2%	1.6%	1.7%	1.6%	1.7%	7.0%	7.4%	7.4%	25.1%	26.1%	22.7%	23.9%
2007	Local Public	36	131	168	152	186	174	183	166	182	178	145	158	133	147
	Non-local Public	1	0	0	0	0	0	0	9	8	3	1	1	1	4
	Voc-Tech	0	0	0	0	0	0	0	0	0	0	9	14	15	12
	Private/Parochial	5	5	7	5	3	2	5	4	7	6	47	40	27	30
	Non-Local Tot	6	5	7	5	3	2	5	13	15	9	57	55	43	46
	TOTAL	42	136	175	157	189	176	188	179	197	187	202	213	176	193
	% NON-LOCAL	14.3%	3.7%	4.0%	3.2%	1.6%	1.1%	2.7%	7.3%	7.6%	4.8%	28.2%	25.8%	24.4%	23.8%
2008	Local Public	38	149	153	173	154	187	174	179	166	184	143	144	157	122
	Non-local Public	0	0	0	0	0	0	0	4	6	5	3	3	0	6
	Voc-Tech	0	0	0	0	0	0	0	0	0	0	12	8	14	12
	Private/Parochial	8	3	2	7	6	5	3	7	9	7	38	43	39	32
	Non-Local Tot	8	3	2	7	6	5	3	11	15	12	53	54	53	50
	TOTAL	46	152	155	180	160	192	177	190	181	196	196	198	210	172
	% NON-LOCAL	17.4%	2.0%	1.3%	3.9%	3.8%	2.6%	1.7%	5.8%	8.3%	6.1%	27.0%	27.3%	25.2%	29.1%
2009	Local Public	25	118	168	158	178	153	187	173	180	166	150	138	141	147
	Non-local Public	0	0	1	0	0	0	0	2	2	5	0	3	0	1
	Voc-Tech	0	0	0	0	0	0	0	0	0	0	24	13	7	12
	Private/Parochial	6	6	4	5	7	7	10	3	7	11	28	37	44	44
	Non-Local Tot	6	6	5	5	7	7	10	5	9	16	52	53	51	57
	TOTAL	31	124	173	163	185	160	197	178	189	182	202	191	192	204
	% NON-LOCAL	19.4%	4.8%	2.9%	3.1%	3.8%	4.4%	5.1%	2.8%	4.8%	8.8%	25.7%	27.7%	26.6%	27.9%
2010	Local Public	26	125	131	162	161	183	149	185	172	178	141	153	143	131
	Non-local Public	0	0	0	0	0	0	0	6	0	2	1	0	3	2
	Voc-Tech	0	0	0	0	0	0	0	0	0	0	6	20	11	7
	Private/Parochial	4	4	7	6	6	7	11	9	6	10	40	26	44	45
	Non-Local Tot	4	4	7	6	6	7	11	15	6	12	47	46	58	54
	TOTAL	30	129	138	168	167	190	160	200	178	190	188	199	201	185
	% NON-LOCAL	13.3%	3.1%	5.1%	3.6%	3.6%	3.7%	6.9%	7.5%	3.4%	6.3%	25.0%	23.1%	28.9%	29.2%

Source: Prepared by HCPC, Inc. based on the data obtained from the Connecticut State Department of Education (CSDE).

APPENDIX TABLE 2.13
REGIONAL SCHOOL DISTRICT 13 RESIDENT PUPILS ATTENDING NONPUBLIC SCHOOLS
BY GRADE LEVEL, 2002-2010

		K-4	5-8	9-12	K-12	PK-12
2002	Local Public	830	702	575	2107	2120
	Non-local Public	0	23	8	31	31
	Voc-Tech	0	0	44	44	44
	Private/Parochial	42	27	87	156	161
	Non-Local Total	42	50	139	231	236
	TOTAL	872	752	714	2338	2356
	% NON-LOCAL	4.8%	6.6%	19.5%	9.9%	10.0%
2003	Local Public	829	714	581	2124	2153
	Non-local Public	0	24	5	29	29
	Voc-Tech	0	0	42	42	42
	Private/Parochial	30	30	97	157	162
	Non-Local Total	30	54	144	228	233
	TOTAL	859	768	725	2352	2386
	% NON-LOCAL	3.5%	7.0%	19.9%	9.7%	9.8%
2004	Local Public	851	715	580	2146	2181
	Non-local Public	1	24	6	31	31
	Voc-Tech	0	0	47	47	47
	Private/Parochial	22	25	92	139	148
	Non-Local Total	23	49	145	217	226
	TOTAL	874	764	725	2363	2407
	% NON-LOCAL	2.6%	6.4%	20.0%	9.2%	9.4%
2005	Local Public	834	733	567	2134	2170
	Non-local Public	1	21	4	26	26
	Voc-Tech	0	0	54	54	54
	Private/Parochial	27	27	105	159	167
	Non-Local Total	28	48	163	239	247
	TOTAL	862	781	730	2373	2417
	% NON-LOCAL	3.2%	6.1%	22.3%	10.1%	10.2%
2006	Local Public	840	712	578	2130	2164
	Non-local Public	0	21	5	26	26
	Voc-Tech	0	0	54	54	54
	Private/Parochial	22	21	128	171	179
	Non-Local Total	22	42	187	251	259
	TOTAL	862	754	765	2381	2423
	% NON-LOCAL	2.6%	5.6%	24.4%	10.5%	10.7%
2007	Local Public	811	709	583	2103	2139
	Non-local Public	0	20	7	27	28
	Voc-Tech	0	0	50	50	50
	Private/Parochial	27	17	144	188	193
	Non-Local Tot	27	37	201	265	271
	TOTAL	838	746	784	2368	2410
	% NON-LOCAL	3.2%	5.0%	25.6%	11.2%	11.2%
2008	Local Public	816	703	566	2085	2123
	Non-local Public	0	15	12	27	27
	Voc-Tech	0	0	46	46	46
	Private/Parochial	26	23	152	201	209
	Non-Local Total	26	38	210	274	282
	TOTAL	842	741	776	2359	2405
	% NON-LOCAL	3.1%	5.1%	27.1%	11.6%	11.7%
2009	Local Public	775	706	576	2057	2082
	Non-local Public	1	9	4	14	14
	Voc-Tech	0	0	56	56	56
	Private/Parochial	39	21	153	213	219
	Non-Local Total	40	30	213	283	289
	TOTAL	815	736	789	2340	2371
	% NON-LOCAL	4.9%	4.1%	27.0%	12.1%	12.2%
2010	Local Public	762	684	568	2014	2040
	Non-local Public	0	8	6	14	14
	Voc-Tech	0	0	44	44	44
	Private/Parochial	41	25	155	221	225
	Non-Local Total	41	33	205	279	283
	TOTAL	803	717	773	2293	2323
	% NON-LOCAL	5.1%	4.6%	26.5%	12.2%	12.2%

Source: Prepared by HCPC, Inc. based on the data obtained from the Connecticut State Department of Education (CSDE).

SECTION 3

PUBLIC SCHOOL ENROLLMENT GROWTH TRENDS 1984 - 2011

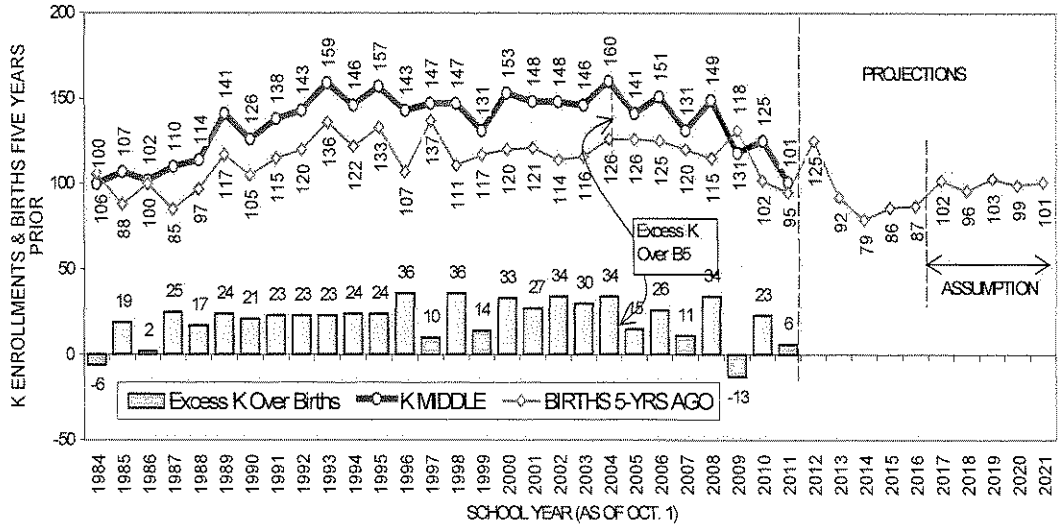
3.1 Regional School District #13 Public School Enrollment Growth Trends

In this section, we try to understand the ways in which the factors identified in Section 2 have actually affected enrollment in Regional School District #13 public schools over the past 27 years, between 1984 and 2011. As we have already discussed the trends in births in Section 2, we begin this section with an analysis of kindergarten enrollment because all upper grade enrollments are derived from the kindergarten enrollment. Obviously, the kindergarten cohort of today will grow up to become the twelfth-graders of tomorrow.

3.2 Births and Kindergarten Enrollment

Figure 3-1 superimposes the trends of births 5 years prior (B5) and the kindergarten enrollments in Regional School District #13 since 1984. In spite of annual fluctuations in both trends, observe that the trend lines are more or less parallel to each other indicating that the annual changes in kindergarten enrollments closely followed the ups and downs of the number of births in Regional School District #13 five years earlier. Generally, kindergarten enrollments exceeded the number of births five years ago (B5) in Regional School District #13 mainly due to a net in-migration of preschool children during the five years preceding their entry into kindergarten classes.

FIG 3-1
BIRTHS AND KINDERGARTEN ENROLLMENTS
REGIONAL SCHOOL DISTRICT 13, 1984-2021



In spite of considerable annual fluctuation, the recent trend of Kindergarten enrollments has been declining from the peak enrollment of 160 students in 2004 to 101 K students in 2011.

Figure 3-1 also shows at the bottom of the chart (the bar graph) the excess of K enrollments over births from five-year before. Note that these additional K enrollments over B5 are primarily due to a net in-migration of preschool children, and that these additional numbers of kindergartners over births have been fluctuating considerably from year to year: the excess K over B between 2001-2004 was on average 30 children, but observe that in Figure 3-1, *the excess K over B dwindled so much during the last few years of economic turmoil* that the kindergarten enrollment in 2009 was even 13 students *lower* than the births from five years prior. In short, the net in-migration of preschool children into Regional School District #13 fluctuated in accordance with the vagaries of the economic cycles.

Over the next five years, it is likely that kindergarten enrollments will continue to decline because the number of births in Regional School District #13 declined considerably during the past five years, between 2007 and 2011. Furthermore, the net in-migration of preschool children will most likely continue to be relatively low as long as the high unemployment rates in the nation and Connecticut persist or at best improve slowly. As far as the K enrollments over the second five years (between 2017 and 2021) are concerned, the three birth scenarios, low, flat and high births, will dictate the size of K enrollments.

According to regression equation 3.1 shown below, the dependent variable K(T), kindergarten enrollment in a given year T in RSD #13, is positively affected by independent variables UCT(-5), the number of births in Connecticut five years ago, and is also positively impacted by HSALL(T), the total number of home sales in the year T in Regional School District #13. * The figures in parentheses in the second row are t-ratios; R^2 = the coefficient of determination; SEE = Standard Error of Estimates; and D.W. = Durbin-Watson statistics. The R^2 is 0.650 indicating that 65.0% of the variability of kindergarten enrollments during the since 1996 (15 years) is explained by the variables included in the equation.

[3.1] K(T) = 0.001586UCT(-5) + 0.473567HSALL(T) [1996-2011]
(5.49) (4.73)
$\bar{R}^2$ (Bar Squared) = 0.650 SEE = 13.83 D.W. = 1.16 MVD = 125.15

According to the equation above, the kindergarten enrollment in Regional School District #13 annually deviated from the trend line within a range of ±27.7 (13.83 x 2) students or 22.1% (27.7 / 125.15) deviations from regression line (2 S.E.E.s) for 95% of the time. These statistics imply that the above equation depicts the past trends of kindergarten enrollments with poor accuracy.**

* Note that the size of K enrollments had been more 'significantly' correlated to the births trend of Connecticut than the birth trends of Durham and Middlefield.

** The 22.1% margin of error of equation 3.1 is less than the ±31.7% margin of error of a simple regression equation shown in Table 3.3 on page 3-12. This finding implies that Equation 3.1 may not be the best equation to use in projecting K enrollments but it is still a better tool to do so than the Cohort-Survival Method.

3.3 Historical Enrollment Data by Grade and Grade Level

Tables 3.1A and B below present the annual enrollment data by grade and grade level since 1984. In this table, grade enrollments include all special education and special needs students: i.e., they are not separately listed as un-graded.* We will use these enrollments in projecting future enrollments in Section 5 of this report.

TABLE 3.1A
HISTORY OF REGIONAL SCHOOL DISTRICT #13 PUBLIC SCHOOLS ENROLLMENT BY GRADE
1984-2011 (AS OF OCTOBER 1)

Peak and trough enrollments are shown in bold and peaks are also underlined.

As of Oct. 1	PK	K	1	2	3	4	5	6	7	8	9	10	11	12
1984	--	**100***	117	**83**	112	107	111	109	117	155	143	141	130	103
1985	--	107	**115**	106	**89**	112	112	110	111	120	124	135	133	136
1986	15	102	123	111	105	**92**	116	117	124	106	98	120	136	133
1987	12	110	133	108	111	113	**90**	120	117	119	102	98	113	136
1988	13	114	119	122	109	115	114	**94**	120	125	108	104	89	112
1989	9	141	134	123	123	114	127	120	**96**	119	101	106	96	86
1990	*12*	*126*	*166*	*128*	*125*	*129*	*120*	*133*	*122*	***98***	*103*	*101*	*98*	*95*
1991	*12*	*138*	*147*	*159*	*130*	*131*	*135*	*125*	*134*	*124*	***85***	*103*	*93*	*97*
1992	*11*	*143*	*161*	*141*	*161*	*136*	*137*	*141*	*126*	*136*	*107*	***84***	*95*	*92*
1993	*11*	*159*	*168*	*154*	*143*	*168*	*143*	*143*	*143*	*128*	*118*	*107*	***78***	*94*
1994	*12*	*146*	*159*	*161*	*157*	*149*	*161*	*149*	*145*	*132*	*111*	*117*	*99*	***77***
1995	13	157	139	156	163	171	156	154	142	127	121	108	110	106
1996	22	143	167	145	155	164	176	156	158	138	121	120	103	106
1997	23	147	154	171	145	157	166	177	155	161	125	119	108	101
1998	18	147	174	159	170	142	158	172	180	160	135	112	108	103
1999	18	131	165	184	163	167	149	160	175	183	133	124	104	111
2000	19	153	159	165	**188**	171	177	159	154	176	156	129	119	103
2001	18	148	177	166	170	**192**	171	177	153	151	155	159	126	123
2002	13	148	164	183	163	172	**193**	166	**188**	155	147	146	153	129
2003	29	146	168	162	183	170	169	185	170	190	143	140	145	**153**
2004	35	**160**	156	179	164	192	177	176	189	173	162	134	135	149
2005	36	141	**183**	162	178	170	192	173	177	**191**	145	**162**	127	133
2006	34	151	152	**187**	169	181	173	**187**	176	176	**164**	133	**160**	121
2007	36	131	168	152	186	174	183	166	182	178	145	158	133	147
2008	38	149	153	173	154	187	174	179	166	184	143	144	157	122
2009	25	118	168	158	178	153	187	173	180	166	150	138	141	147
2010	26	125	131	162	161	183	149	185	172	178	141	154	143	136
2011	14	101	134	130	171	160	182	143	184	174	150	136	155	141

Source: Connecticut State Department of Education. * The lowest K enrollment could have been in 1983. (See footnote below.)

* The original enrollment data between 1984 and 1994 recorded special education/need students as un-graded students. Therefore, HCPC allocated these un-graded students to each grade in proportion to the graded enrollments. Accordingly, the 1984-1989 data are approximations. In addition, the 1990-1994 enrollment data were not available so that they are estimated by forecasting the past 1984-1989 data and then adjusted by "back-casting" (or forecasting backward) based on the actual 1995-2000 enrollment data. We believe the data are reasonably accurate for our study purposes, but they should not be copied and used by others without due caution. In contrast, the 1995-2010 enrollment data, which were obtained from the Connecticut State Department of Education (CSDE), already included the *graded* special education and special need students. Note also the data obtained from the CSDE may be slightly different from the data obtained from the Regional School District #13 Public Schools. HCPC decided to use the CSDE data in order to be consistent with the nonpublic school enrollment data, which were also obtained from the CSDE. See also page 6-1.

TABLE 3.1-B
HISTORY OF REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOL ENROLLMENTS
BY GRADE LEVEL, 1984-2011 (AS OF OCTOBER 1)

Peak and trough enrollments are shown in bold and peaks are also underlined.

As of Oct. 1	K-4	5-6	7-8	9-12	K-12	PK-12	5-8
1984	**519**	220	272	517	1528	1528	492
1985	529	222	231	528	1510	1510	453
1986	533	233	230	487	1483	1498	463
1987	575	210	236	449	1470	1482	**446**
1988	579	**208**	245	413	**1445**	1458	453
1989	635	247	**215**	389	1486	1495	462
1990	674	253	220	397	1544	1556	473
1991	705	260	258	**378**	1601	1613	518
1992	742	278	262	**378**	1660	1671	540
1993	792	286	271	397	1746	1757	557
1994	772	310	277	404	1763	1775	587
1995	786	310	269	445	1810	1823	579
1996	774	332	296	450	1852	1874	628
1997	774	343	316	453	1886	1909	659
1998	792	330	340	458	1920	1938	670
1999	810	309	358	472	1949	1967	667
2000	836	336	330	507	2009	2028	666
2001	**853**	348	304	563	2068	2086	652
2002	830	359	343	575	2107	2120	702
2003	829	354	360	581	2124	2153	714
2004	851	353	362	580	**2146**	**2181**	715
2005	834	**365**	**368**	567	2134	2170	**733**
2006	840	360	352	578	2130	2164	712
2007	811	349	360	**583**	2103	2139	709
2008	816	353	350	566	2085	2123	703
2009	775	360	346	576	2057	2082	706
2010	762	334	350	574	2020	2046	684
2011	696	325	358	582	1961	1975	683

3.4 Enrollment Cycles: Peaks and Troughs

A review of the number of births in both Connecticut and Regional School District #13 reveals that birth cycles exist. Connecticut's birth cycle is a 15-year half cycle* from its 1976 trough (35,607 births) to its 1990 peak (50,098 births). On the other hand, as shown in Table 3.2, Regional School District #13 has a 14-year birth half cycle from the 1978 trough (84 births) to 1992 peak (137 births). The birth cycle of a school district generally is duplicated by cycles of school enrollments in most towns in Connecticut. However, due to annual variations of the net in-migration of school age children into Regional School District 13, the enrollment cycle may not be exactly the same among the various grade levels. As shown in Table 3.2 on the next page, all grade levels in Regional School District #13 have regular 16- to 18-year half cycles.

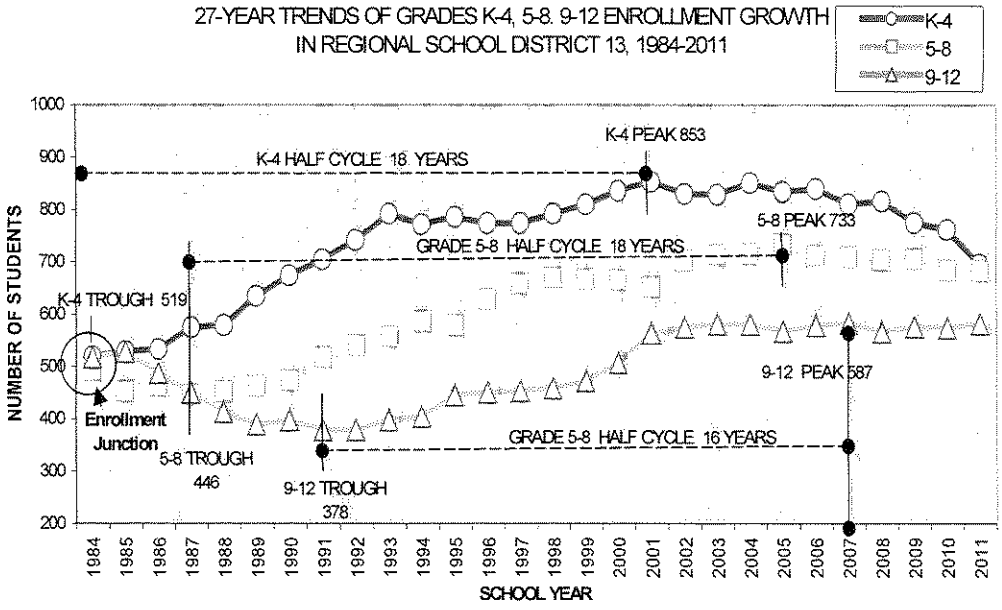
* A cycle or full cycle refers to a time period between one peak and the next peak, or between one trough and the next trough. Thus, a half cycle refers to either a trough to a peak or a peak to a trough.

TABLE 3.2
ENROLLMENT CYCLES
REGIONAL SCHOOL DISTRICT #13 PUBLIC SCHOOLS, CONNECTICUT 1970-2009

Grade Level	Year of Trough	Trough Enrollment	Year of Peak	Peak Enrollment	Duration of Half Cycles
Births	1978	84	1992	137	14 year half cycle from trough to peak
K-4	1984*	519	2001	853	17 Year half cycle from trough to peak
5-8	1987	446	2005	733	18 Year half cycle from trough to peak
9-12	1991	378	2007	583	16-year half cycle from trough to peak

Source: HCPC, Inc. See Table 3.1B. * Actual trough year could be one or two years earlier than 1984.

FIG. 3-2
27-YEAR TRENDS OF GRADES K-4, 5-8, 9-12 ENROLLMENT GROWTH
IN REGIONAL SCHOOL DISTRICT 13, 1984-2011



As noted in Table 3.2 and illustrated in Figure 3-2, the peaks and valleys in the enrollments of different grade levels fall on different years because the pattern of the upper grades must inherently follow that of the lower grades. Therefore, there are time lags between grade level peaks and troughs. As shown in Table 3-1B (troughs and peaks are shown in bold and peaks are also underlined) and Fig. 3-2 also shows that there is a three-year lag between grades K-4 and grades 5-8 enrollment troughs (if we assume the actual K-4 trough occurred I 19823 there were a four-year lag) and a lag of four years between grades 5-8 and grades 9-12 enrollment troughs. Similarly, there was a four-year lag between grades K-4 and grades 5-8 peak enrollments, but there was only a one-year lag between middle and high school peaks. Due to the vagaries of high school nonpublic school enrollments, the timing of troughs and peaks of high school enrollments could be irregular.

3.5 Grades K-4 Enrollment

There were 519 K-4 students in 1984 (see Table 3.1-B), which grew to a peak enrollment of 853 students in 2001, an increase of 334 students (+64%) in 17 years, or an annual average rate of approximately 20 students per year. But the K-4 enrollment reversed this trend and started to decline beginning in 2002, reaching 696 students in 2011, a decline of 157 students in ten years or -15.7 students per year. The recent decline in elementary school enrollments was a reflection of the decreasing number of births since the 1992 birth peak in Regional School District #13 because the number of childbearing-age (CBA) women is no longer increasing while fertility rates are decreasing due to the recessionary economic conditions. The question is: will K-4 enrollments continue to decline, remain stable, or even increase over the next ten years?

The growth/decline pattern of K-4 enrollments during the past 22 years (1989-2011) is well captured by the following regression equation:

[3-2] $K4(T) = 1.612172\ BR(-9) + 2.94825\ K(-1) + 1.346382\ K(-4)$ [1989-2011]

(3.46) (8.24) (2.74)

$\bar{R}^2$ (Bar Squared) = 0.743 SEE = 30.08 D.W. = 1.98 MVD = 783.26

where the dependent variable K4(T) represents the grades K-4 enrollments in the year T; independent variables BR(-9) is the number of births in Region 13 nine years prior to T; and K(-1) and K(-4) are the K enrollments one and four years prior to T, respectively. From this equation, note that the growth pattern of Regional School District 13's elementary school enrollments increased (or decreased) by 1.6 students per birth nine years ago and by 2.95 students per K student a year ago and by 1.35 students per K student four years ago. The equation indicates that 74.3% (R^2 = 0.743) of the variations in K-4 enrollments can be explained by the independent variables included in the equation. The SEE (Standard Error of Estimates) of the regression shows that 95% of the time, annual variations in grades K-4 enrollment fall within a range of $\pm$ 60 students (30.08 x 2 = 60.16 or 2 SEE's) from the expected mean of grade K-4 enrollments. The SEE also implies that on average the margin of error is within $\pm$ 7.7% (60.16 ÷ 783.26) at the 95% confidence level. In sum, Equation 3.2 is a moderately accurate model that describes K-4 enrollment growth over the past 22 years between 1989 and 2011.

From this equation, it is clear that the continued decline in births will reduce kindergarten enrollments and thus also K-4 enrollments in Regional School District #13's public elementary schools.

3.6 Grades 5-8 Enrollment

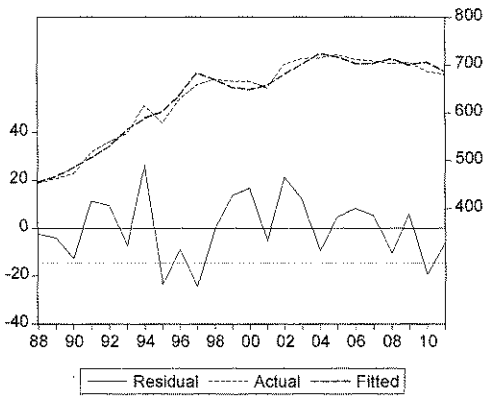
As shown in Table 3.1B and Figure 3-2, middle school or grades 5-8 enrollment increased from 446 students in 1987 to 733 students in 2005, a gain of 287 students (+64%) in 18 years, or an addition of on average 15.9 students per year. Middle school enrollments then decreased to 683 students in 2011, losing 50 students in six years at the rate of on average -8 students per year.

Clearly the rate of decline has been slower (about one half) than the growth rate previously experienced until 2005.

Equation 3.3 below describes grades 5-8 enrollment trends over the past 23 years, between 1988 and 2011:

[3.3] G58(T) = 59366811 + 0.318950 K4(-3) + 0.481629K4(-4) - 5.557098M(-1) [1988-2011]
(2.52) (2.15) (3.54) (-2.26)
$\overline{R^2}$ (Bar Squared) = 0.972 SEE = 14.54 D.W. = 2.14 MVD = 632.87

According to the multiple regression equation 3.3 shown above, RSD 13's middle school enrollment (grades 5 - 8) in a given year T was positively related to K4(-3) and K4(-4), the grades K-4 elementary school enrollments three and four years prior to year T, respectively, but negatively affected by UM(-1), the Middlefield resident unemployment rate in the year T-1. The variables included in the equation explained 97.2% of all variations in the middle school enrollment (R^2 = 0.972) between 1988 and 2011. The SEE also implies that on average the margin of error is within ±4.6% (14.54 X 2 ÷ 632.87) at the 95% confidence level. In sum, Equation 3.3 is a quite accurate model to describe middle school enrollment growth/decline over the past 23 years between 1988 and 2011.



A comparison of actual and fitted enrollment that occurred in the past 23 years

The Chart on the left compares actual and grades 5-8 enrollments fitted by a regression equation, and the resulting residuals. The chart demonstrates that the regression equation is a reasonably good predictor of the middle school enrollment fluctuations occurred in the past 23 years between 1988 and 2011.

3.7 Grades 9-12 Enrollments

With four grades in a high school, grades 9-12 enrollments should be equal to roughly the combined enrollments of two middle schools, but actual high school enrollments are much smaller than the middle school enrollments because a large portion of high school students are enrolled at nonpublic schools. High school enrollments were the last to reach their lowest level or trough with 378 students in 1991, seven years after the grades K-4's trough and four years after the grades 5-8's trough in 1987. Henceforth, high school enrollments steadily expanded reaching

583 students in 2007, an increase of 205 students or 54% in 16 years, adding on average nearly 12.8 students per year.

The past growth patterns of Coginchaug Regional High School enrollments are depicted by the following regression equation:

[3.4] G912(T) = 0.353045 K4(-8) + 0.458268 G58(-2) - 8.238488 UM(-1) [1995-2011]
(3.45) (3.65) (-2.26)
$\overline{R^2}$ (Bar Squared) = 0.935 SEE = 19.22 D.W. = 1.08 MVD = 516.40

High school enrollments, G912 (T), in the current year T is positively influenced by the variables: K4(-8), grades K-4 enrollment of eight years prior to T and G58(-2), grades 5-8 enrollments of two years prior to T. They are negatively impacted by UM(-1), Middlefield's unemployment rates a year prior T (representing the unemployment rates of regional school district 13).* High school enrollments are sensitive to the unemployment rates of current years: the equation shows that a one percent increase (or decrease) of Middlefield's unemployment rate will reduce (or increase) high school enrollments by 8.2 students. With the given SEE value, the margin of error is calculated to be +/- 7.4% at a 95% confidence level.

3.8 Grades K-12 Enrollments

K-12 enrollments grew from a low level of 1,445 students in 1988 to 2,146 students in 2004, a gain of 701 students in 16 years, or an addition of 44 students per year, that is, on average 3.4 students per grade per year. However, after reaching their enrollment peak in 2004, K-12 enrollments dropped to 1,961 students in 2011, a loss of 185 students in seven years at the average rate of nearly -26.4 students per year. It is clear that K-12 enrollments experienced a declining rate 40% less than the growth rate registered prior to 2004. The K-12 enrollment growth and decline since 1986 is depicted by the regression equation shown below:

[3.5] GK12(T) = 4.653915 G58(-2) - 49.01357 UM(-1) - 30.14936 T [1986-2011]
(18.76) (-4.37) (-8.44)
$\overline{R^2}$ (Bar Squared) = 0.912 SEE = 71.63 D.W. = 1.37 MVD = 1870.80

Equation 3.5 shown above indicates that K12(T), the K-12 enrollments in Regional School District #13, is positively affected by three independent variables: G58 (-2), grades 5-8 enrollments of two years prior to year T; UM(-1), the unemployment rate of Middlefield a year ago; and the time variable T (1975=0). On average, every year K-12 enrollments decreased by 30 students and the enrollment declined/increased by 49 students per one percent change in Connecticut's unemployment rate.

* Although equation 3.4 seems to indicate that RSD 13's high school enrollments are sensitive to Middlefield's unemployment rates but not to Durham's unemployment rate, this is not the case. One may consider that Middlefield's unemployment rates represent both Middlefield and Durham, but better than Durham.

The R bar squared statistics indicate that 91.2% of the K-12 enrollment change in the previous decade could be explained by the three variables included in the equation. SEE is 71.63 students, implying that on average the margin of error is within ±7.7% at the 95% confidence level. In short, equation 3.5 is a reasonably accurate model for the past K-12 enrollment trend.

3.9 Cohort-Survival Ratio Trends

Practically all school districts use the Cohort-Survival Method (CSM) for making enrollment projections. This method traces annual changes in cohort-survival or retention ratios, which are derived by dividing the lower grade enrollment of a year ago into the current grade enrollment. The advantages of the CSM are that it is simple to use and easy to understand. Over the years, the method has shown itself capable of producing fairly accurate projections as long as it can initially project the size of kindergarten classes accurately, and as long as the retention ratios are stable. However, the CSM is limited because it relies on one variable to project enrollments, either births five years prior to the projected K enrollments or the previous year's enrollment for the ensuing grades 1 through 12, and the method assumes that retention ratios remain *constant* as shown by the equation below:*

[3.6] $G(T) = f\ G(-1)$

[3.7] $G(T) = a + b\ G(-1)$ where $a=0$ or $G(T) = b\ G(-1)$

Equation 3.6 says that G(T), grade enrollment in current year T, is a function of G(-1), its enrollment in the previous year. When Equation 3.6 is expressed in a linear form, it is expressed as Equation 3.7 where b is the coefficient of independent variable G(-1). In short, CSM is a *pseudo* Simple (one variable) linear regression method where the independent variable coefficient b = the survival ratio, and a = 0. It is *similar* to a simple regression, but its coefficients are slightly different from the coefficient derived by the statistical method. Besides, CSM does not yield probability statistics whereas the simple regression offers probability statistics. The coefficient b is usually estimated by 3- or 5-year average survival ratios. Thus, CSM produces reasonably accurate projections for the short-term (5-years or less) but not for the long-term (5 or more years) unless the stability of survival ratios is well documented.

Table 3.2 on page 3-12 compares the 3-, 5-, 10-, W. 3- and W. 5-year average survival ratios for Regional School District #13 as well as the b coefficient estimated by the Simple Regression Method. For each b, the R^2 is also shown. In addition, the maximum and minimum survival ratios experienced since 2002 are included. From this table and Figure 3-3 below, observe the following:

---

* Similarly, the kindergarten enrollments are projected by:

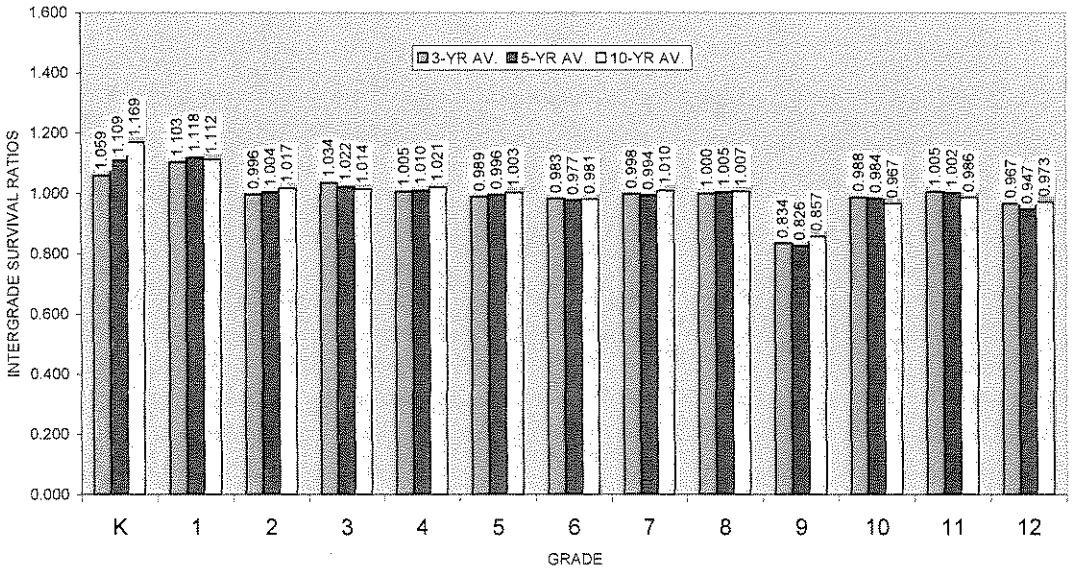
[3.8] $K(T) = f\ B(-5)$

[3.9] $K(T) = a + b\ B(-5)$ where $a=0$ or $K(T) = b\ B(-5)$

Where K(T) = kindergarten enrollments in the current year T; B(-5) = the number of births five years ago; a = constant; and b = coefficient of variable B(-5).

1) The 10-year average survival ratios for eight grades (K, G1, G2, G4, G5, G7, G8, and G9) are greater than the 3-year average survival ratios except for five grades (G3, G6. G10, G11 and G12) which show smaller 10-year average survival ratios than the 3-year ratios. Thus, the application of 10-year survival ratios yields higher enrollment projections while the application of 3-year ratios produces low enrollment projections. The 3-year average survival ratios are much lower than the 10-year average ratios due to the fact that enrollments for each grade have been declining compared to previous years' enrollments in recent years, especially the last two years due to higher unemployment rates during the immediate past.

FIG. 3-3
3-, 5-, AND 10-YEAR AVERAGE INTER-GRADE SURVIVAL RATIOS
REGIONAL SCHOOL DISTRICT 13, 2002-2011

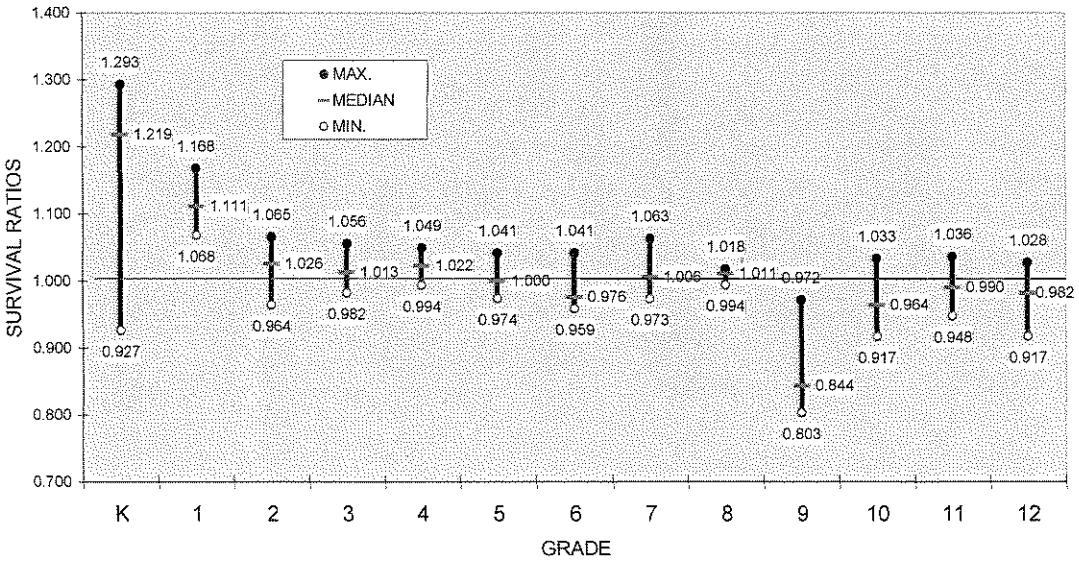


2) In general, the differences between the 3- and 10-year average cohort survival ratios are not large with the 5-year survival ratios occupying more or less the midpoints of the 3- and 10-year survival ratios. Accordingly, the application of 5-year average survival ratios yields more or less middle enrollment projections.

3) Stability or Variability Index of Survival Ratios: As noted earlier, the stability assumption of the b coefficient (the survival ratio) is crucial for being able to apply the constant survival ratios derived from past trends and to project numbers for the next ten years. We have chosen the max-min range* (see Table 3.3) to assess the variability of survival ratios during the past 10 years. A broad max-min range indicates that survival ratios varied considerably from year to year, and a narrow max-min range indicates that survival ratios did not change much from year to year. Thus, a large max-min range indicates less stability than does a small max-min range. From Table 3.3 and also from Figure 3.4 below, it is clear that the max-min ranges by

grade are the widest for Kindergarten followed by grades 9, 10, 12, 11, 2 and 1 in that order, indicating the difficulty of accurately forecasting these grade enrollments, especially the K ..enrollments.

FIG. 3-4
MAXIMUM-MINIMUM RANGE OF INTER-GRADE SURVIVAL RATIOS
REGIONAL SCHOOL DISTRICT 13, 2002-2011



* A better index for assessing the stability of survival ratios is the *standard deviation* of b. The standard deviation measures the extent of spread or dispersion of the b coefficient in various years from its mean. Thus, when survival ratios are very different from each other, the standard deviation is large, and when survival ratios are more or less the same, the standard deviation is small. In short, a large standard deviation signals that survival ratios are not stable (they are highly variable from year to year), while a small standard deviation indicates that survival ratios are temporally stable (do not change too much from year to year). Note that according to S.E.E. on Table 3.2, the stability of b coefficients are ranked as K, 2, 1, 9 and 11 in that order, which is different from the survival ratios.

Table 3.3
GRADES K-12 COHORT-SURVIVAL RATIOS
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOLS, 2002-2011

BIRTH YEAR	SCHOOL YEAR	K	1	2	3	4	5	6	7	8	9	10	11	12
2007	2002	1.293	1.107	1.035	0.962	1.011	1.007	0.968	1.063	1.012	0.972	0.941	0.963	1.024
2008	2003	1.247	1.135	0.988	1.000	1.043	0.983	0.959	1.024	1.011	0.923	0.952	0.993	1.000
2009	2004	1.273	1.068	1.065	1.012	1.049	1.041	1.041	1.022	1.018	0.853	0.937	0.964	1.028
2010	2005	1.120	1.144	1.038	0.994	1.037	1.000	0.977	1.006	1.011	0.838	1.000	0.948	0.985
2011	2006	1.213	1.078	1.022	1.043	1.017	1.018	0.974	1.017	0.994	0.859	0.917	0.988	0.953
2012	2007	1.095	1.113	1.000	0.995	1.030	1.011	0.960	0.973	1.011	0.824	0.963	1.000	0.919
2013	2008	1.274	1.168	1.030	1.013	1.005	1.000	0.978	1.000	1.011	0.803	0.993	0.994	0.917
2014	2009	0.927	1.128	1.033	1.029	0.994	1.000	0.994	1.006	1.000	0.815	0.965	0.979	0.936
2015	2010	1.224	1.110	0.964	1.019	1.028	0.974	0.995	1.000	0.994	0.849	1.033	1.036	0.979
2016	2011	1.025	1.072	0.992	1.056	0.994	0.995	0.960	0.989	1.006	0.838	0.965	1.000	0.986
3-YR AV.		1.059	1.103	0.996	1.034	1.005	0.989	0.983	0.998	1.000	0.834	0.988	1.005	0.967
5-YR AV.		1.109	1.118	1.004	1.022	1.010	0.996	0.977	0.994	1.005	0.826	0.984	1.002	0.947
10-YR AV.		1.169	1.112	1.017	1.014	1.021	1.003	0.981	1.010	1.007	0.857	0.967	0.986	0.973
W. 3-YR AV.		1.075	1.094	0.990	1.039	1.005	0.989	0.977	0.996	1.001	0.838	0.988	1.009	0.975
W. 5-YR AV.		1.097	1.109	0.998	1.031	1.007	0.992	0.978	0.996	1.003	0.831	0.987	1.005	0.960
MIN.		0.927	1.068	0.964	0.982	0.994	0.974	0.959	0.973	0.994	0.803	0.917	0.948	0.917
MAX.		1.293	1.168	1.065	1.056	1.049	1.041	1.041	1.063	1.018	0.972	1.033	1.036	1.028
RANGE		0.367	0.099	0.101	0.073	0.056	0.067	0.083	0.090	0.023	0.168	0.116	0.088	0.110
MIDDLE		1.110	1.118	1.015	1.019	1.021	1.008	1.000	1.018	1.006	0.887	0.975	0.992	0.972
MEDIAN		1.219	1.111	1.026	1.013	1.022	1.000	0.976	1.006	1.011	0.844	0.964	0.990	0.982
1985-2011:														
Simple Regression Coeff.		1.214	1.121	0.995	1.011	1.026	1.016	1.004	1.003	0.998	0.866	0.969	0.959	0.987
R BAR SQ		0.445	0.771	0.796	0.990	0.972	0.969	0.934	0.965	0.962	0.885	0.955	0.942	0.951
S.E.E.		21.69	9.22	10.69	2.69	4.66	4.92	6.82	5.02	5.30	7.77	4.42	5.66	4.81
MDV		136.7	153.7	152.2	152.3	154.3	153.3	153.9	153.3	150.6	130.1	126.0	120.0	118.4
Avg. Projection Deviations (+/-)		31.7%	12.0%	14.0%	3.5%	6.0%	6.4%	8.9%	6.5%	7.0%	11.9%	7.0%	9.4%	8.1%

Source: H. C. Planning Consultants, Inc.

4) The R^2 statistics of the Simple Regression Method show *very low* values for K (0.445) and also low values for grades 1 and 2. These small R square statistics coupled with relatively large SEEs indicate that it is probable that the K enrollment projections are prone to yield large projection errors (+/- 31.7% for K). Although many other Connecticut school districts also exhibit small R square values with large SEEs for K enrollments, Regional School District #13 also has small R squares and large SEE values, indicating the difficulty of projecting K enrollments from births five years prior. *

* However, it is not unique to Regional School District #13 that K grade enrollments have a smaller R^2 with a large SEE. In general, whenever school children have to enter a lowest grade in a new school such as grade K in an elementary school, grade 6 in a middle school, and 9th grade in a high school, the inter-grade survival ratios change because more students may consider enrolling in nonpublic schools or moving to another town.

3.10 Conclusions

In this section, we reviewed growth trends in enrollments of Regional School District #13 public schools and more importantly, we have discovered the way various factors have contributed to the changes in enrollments of various grade levels. It was found that indeed the number of births and unemployment rates were good indicators of growth and decline in Regional School District #13's school enrollments. Thus, we have laid the foundations for projecting enrollments into the future.

It was also found that the Cohort-Survival Method of enrollment projections is a valid method for *short-term* (e.g., 5 years) forecasts as long as the inter-grade survival ratios are stable. Nonetheless, large variations in the survival ratios for grades K, 1, 2, and 9 (see Fig. 3-4) tend to produce large projection errors, especially for long-term (beyond 5 years) projections. Accordingly, in the next section, we will prepare the enrollment projections by three different methods to check the consistency of the projections.

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SECTION 4

ENROLLMENT PROJECTION ASSUMPTIONS

4.1 Introduction

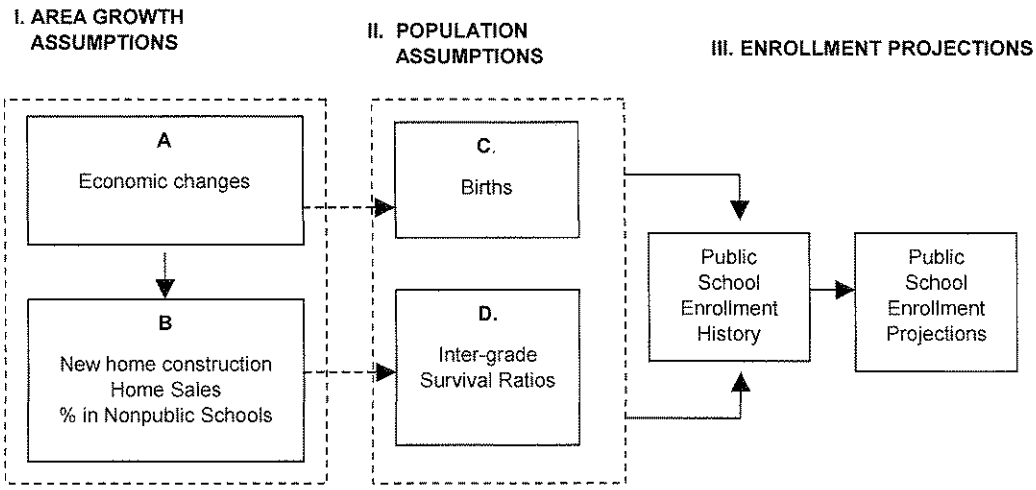
In this section we discuss several assumptions which underlie many of the K-12 enrollment projections to be presented in the next section. We could have presented only one set of assumptions if the future development/growth patterns of Regional School District #13 were reasonably certain. Unfortunately that is not the case, and thus we are presenting a range of scenarios which represents optimistic, pessimistic, and moderate assumptions about the recovery of national, regional and local recessionary economies.

4.2 Enrollment Projections' Procedures and Assumptions

Figure 4-1 below describes the procedures for public school enrollment projections for a school district. In step I, we establish area development assumptions in terms of unemployment rates, net housing gains, and home sales. In step II we derive population growth assumptions of births and migration trends for Regional School District #13's population, assumptions that are consistent with the step I assumptions. In step III, the assumed number of births and net migration of school-age population (expressed in terms of inter-grade survival ratios) are directly applied to the public school enrollments by grade in order to project the kindergarten enrollments and subsequently the upper grade enrollments.

FIG. 4-1

PUBLIC SCHOOL ENROLMENT PROJECTION PROCEDURES AND ASSUMPTIONS



4.3 Alternate Sets of Assumptions

The word 'assumption' means that we are making the best guess as to the future. Furthermore, the word 'projection' implies that the past trends are extended or projected into the future to foresee the future events or outcomes. There are two fundamental complications to following these procedures. First, when our assumptions or guesses are wrong, projections will most likely to be wrong as well. Second, since there are various pasts with different area development or growth patterns, enrollment projections are likely to differ depending on 'which' past we choose to use for enrollment projections. In short, the projections differ when the projection assumptions change.

In Section 2 of this report, we studied the past trends of various factors that influence public school enrollments. In Section 3, we analyzed Regional School District #13's public elementary, middle and high school enrollment growth trends since 1988. Based on these studies, we have chosen five past trends, 3-year, 5-year, 10-year, weighted 3-year and weighted 5-year trends. Relatively short past time spans are chosen because recent trends are considered more relevant to the near future, but not necessarily to the distant future. On the other hand, the 10-year trend may be more relevant to projections for a longer time horizon. In short, the chosen past trends are the assumptions.*

4.4 Area Growth Assumptions

Table 4.1 delineates five sets of assumptions as to the future development patterns of Regional School District 13 in terms of economy (unemployment rates), new housing, home sales and percent of nonpublic school enrollments. These assumptions are derived by averaging each of the 3-, 5-, 10-, weighted 3- and weighted 5-year trends.

As of December 2009, the unemployment rate was 9.9% nationally, 8.8% in Connecticut and 6.5% in Regional School District #13. Although the national unemployment dropped to 9.4% in 2010 and further to 8.5% in 2011, in this economic environment, the future economy seems to be still precarious because the housing sector is still very weak, European economies' futures are uncertain, and inflationary pressure may emerge. It is therefore difficult to foresee the unemployment rates for the future years. Accordingly, for the purpose of school enrollment projections, we have chosen the three scenarios described below:

(a) Low growth or pessimistic scenario in which Connecticut and Regional School District 13's economy will recover very slowly with relatively high unemployment rates persisting for a long time. This scenario is represented by the 3- and weighted 3-year trend covering the years 2009, 2010 and 2011. In these years, the nation has been struggling to move out of a dire economic recession with high unemployment rates. The *average* unemployment rates for the weighted 3-year scenario were 6.8% for RSD 13 and 9.1% for Connecticut (see Table 4.1).

*On the other hand, when we use multiple regression equations to project school enrollments, these equations are considered to be the projection assumptions. For example, equation 3.2 shown on page 3-4 depicts the K-4 enrollment trend between 1989 and 2011, and we used this equation to project the K-4 enrollments in Section 5. In such a case, the equation itself constitutes a projection assumption.

(b) High growth or optimistic scenario assumes that the recessionary economy of Connecticut will revive quickly and the unemployment rates will be lowered within a year or two. The unemployment rates are the low ones which Regional School District 13 and Connecticut enjoyed in 2000 (i.e., 1.8% and 2.3%, respectively). This scenario is represented by a 10-year trend in which average unemployment rates were 4.6% for Regional School District 13 and 6.0% for Connecticut. This ten-year period covers from 2002 to 2011: the period started with the relatively low unemployment rate of 3.4% in 2002 in Regional School District 13 and 4.4% in Connecticut, but note that the 5-, weighted 5- and 10-year trends also include the most recent three years of economic malaise.

(c) Moderate growth scenario in which the national and regional economy will recover from the recession within a few years and return to unemployment rates which are more or less between the high and low growth scenarios. This scenario is represented by 5- AND weighted 5-year trend (covering a period from 2007 to 2011) in which the average unemployment rates were 4.8% for Regional School District 13 and 6.1% for Connecticut. This five-year trend includes the low growth 3-year period but also two years of relatively low unemployment rates in 2007 (3.6% for Regional School District 13) and 2008 (4.1%).

TABLE 4.1
ASSUMPTIONS ON THE FACTORS INFLUENCING
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOL ENROLLMENTS, 1999-2011

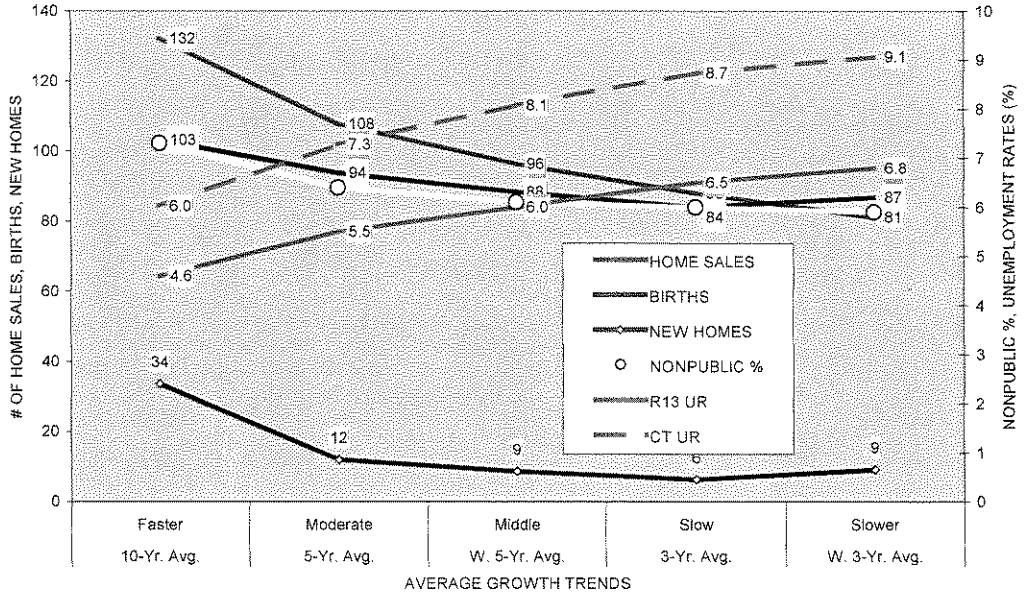
Year	Growth Scenario	Regional School District #13 Unemployment Rate	Conn. Unemployment Rate	Births (State Data)	Housing Net Gain	Home Sales Single Family	% Of Gr. 5-8 Students in Nonpublic schools
		(1)	(2)	(3)	(4)	(5)	(6)
1999		2.3	2.7	126	82	166	--
2000		1.8	2.3	126	75	156	--
2001		2.7	3.1	125	53	151	--
2002		3.4	4.4	120	67	163	8.9
2003		4.6	5.5	115	60	146	9
2004		3.7	4.9	131	55	155	8.3
2005		3.8	4.6	102	52	161	8.1
2006		3.5	4.4	95	42	158	7.2
2007		3.6	4.6	125	37	140	6.6
2008		4.1	5.6	92	4	135	6.7
2009		6.3	8.3	79	0	96	5.5
2010		6.8	9.1	86	11	93	5.8
2011		6.5	8.8	87	8	75	--
				2002-2011 AVERAGES			
W. 3-Yr.	Slower	6.8	9.1	87	9	81	5.9
3-Yr. Avg.	Slow	6.5	8.7	84	6	88	6.0
W. 5-Yr.	Middle	6.0	8.1	88	9	96	6.1
5-Yr. Avg.	Moderate	5.5	7.3	94	12	108	6.4
10-Yr. Avg.	Faster	4.6	6.0	103	34	132	7.3

Sources: Col. (1) and (2) - Connecticut Department of Labor. Column (3) - Connecticut Department of Public Health; Col. (4) - Connecticut Department of Economic and Community Development; Col. (5) - Warren Information Service; Col. (6) - Connecticut State Department of Education

Figure 4-2 below illustrates the growth patterns of Regional School District #13's annual housing net gains, home sales, births, unemployment rates and also the percent of RSD 13's resident K-

12 students attending non-local (or nonpublic) schools during the past ten years. It also shows the averages of 3-, 5-, 10, weighted 3- and weighted 5-year trends as well as the 'middle' assumptions that are derived by averaging the w. 3-year (the lowest) and 10-year (high) trends.

FIG. 4-2
EFFECTS OF UNEMPLOYMENT RATES ON GROWTH FACTORS
REGIONAL SCHOOL DISTRRICT 13, CT 2002-2011



We can observe the following from Figure 4-2 shown above:

(a) Regional School District #13's annual housing gains, home sales and births trends were inversely correlated to the unemployment rates of Regional School District #13 labor force. Thus, as unemployment rates have risen in recent years, the annual net gains, home sales, births in Regional School District #13 and the percent of grades 5-8 Region 13 students attending nonpublic schools declined. Percentages of grades K-4 elementary and grades 9-12 high school students attending nonpublic schools have been immune to the higher unemployment rates evident in recent past, but the percent of grades 5-8 and overall K-12 enrollments were inversely correlated to the area unemployment rate.

(b) The average unemployment rate for the weighted 3-year trend (6.8%) in RSD 13 was the highest while the 10-year trend produced the lowest average unemployment rates (4.6%). The other trends were in-between these two high and low unemployment rates, but the 5-year and weighted 5-year trend showed the unemployment rates closer to the 'middle' assumption (5.5%-6.0%).

4.5 Assumption on Unemployment Rates

It is clear that in addition to assumptions about RSD 13's demographic structure, economic security as represented by the changing pattern of unemployment rates is the primary factor that affects the other leading indicators. Thus, we studied Regional School District #13 residents' unemployment rates, using Table 4.2 and Figure 4-3 on next page. They show that not only the annual averages but also monthly changes in unemployment rates in Regional School District #13 between January 2006 and December 2011. Observe the following:

(a) Annual average unemployment rates of RSD 13 gradually increased from 3.5% in 2006 to 3.6% in 2007 and 4.1% in 2008, but jumped up to 6.3% in 2009, and further to 6.8% in 2010. The rates stayed at the 6.9% level in 2011. It is clear that prevailing economic conditions were worsening rapidly in 2008 and 2009, until the highest level of annual average unemployment was reached at 6.8% in 2010. When we look at only the trend of annual average unemployment rates, there does not seem to be any clear indication of significant economic improvement as of today so that we have decided to study trends in the monthly unemployment rates for RSD 13 as shown in Table 4.2 and illustrated by Fig 4-3 on next page.

(b) The monthly changes in Regional School District #13's unemployment rates showed considerable fluctuation throughout the years. In order to observe the monthly changes, we have shown the highest UR in each year as underlined and bolded figures, and the lowest UR in each year as bolded figures without an underline. From Table 4.2 and Fig. 4-3, we can observe clear signals of economic changes. First, when we trace the lowest monthly unemployment rate for each year, we notice that the lowest UR in 2006 was 3.0% in October, which moved up to 3.2% in October 2007 and remained at 3.2% in April 2008. In short, the UR had been very stable for three years, but the lowest UR nearly doubled to 5.6% in November 2009, an addition of 2.4% within 14 months in 2008 and 2009. These figures are clear and ominous evidence of the economic recession. Afterwards, the lowest UR continued to climb and reached 6.3% in December 2010, indicating only a 0.7% increase within 13 months . The lowest UR dropped sharply to 5.8% in December 2011, indicating clearly that the economy had been improving. A similar story can be told by tracing the highest monthly unemployment rate in each year. In sum the clearest signal for economic improvement was exhibited in 2011 in which the unemployment rate in RSD 13 attained the pinnacle monthly unemployment rate of 8.0% in the region (a total of 544 persons unemployed) during January 2011; however, within a year the UR plummeted to 5.8% in December 2011, a decline of 2.2% in a year. 399 persons unemployed or conversely, 154 unemployed persons landed new jobs. For a small rural community, this is quite a performance. Nonetheless, the region has a long way to go to reduce the number of unemployed to the October 2006 level when the unemployment rate was 3.0% and 199 persons were unemployed. Although we know that an improving economy will be translated into more school enrollments in the long run, this improvement is not going to happen immediately. The seeds of a poor economy were already sown in terms of a very low level of births during the past five years, and

these low level births are going to dictate a low level of school enrollments over the next five years.

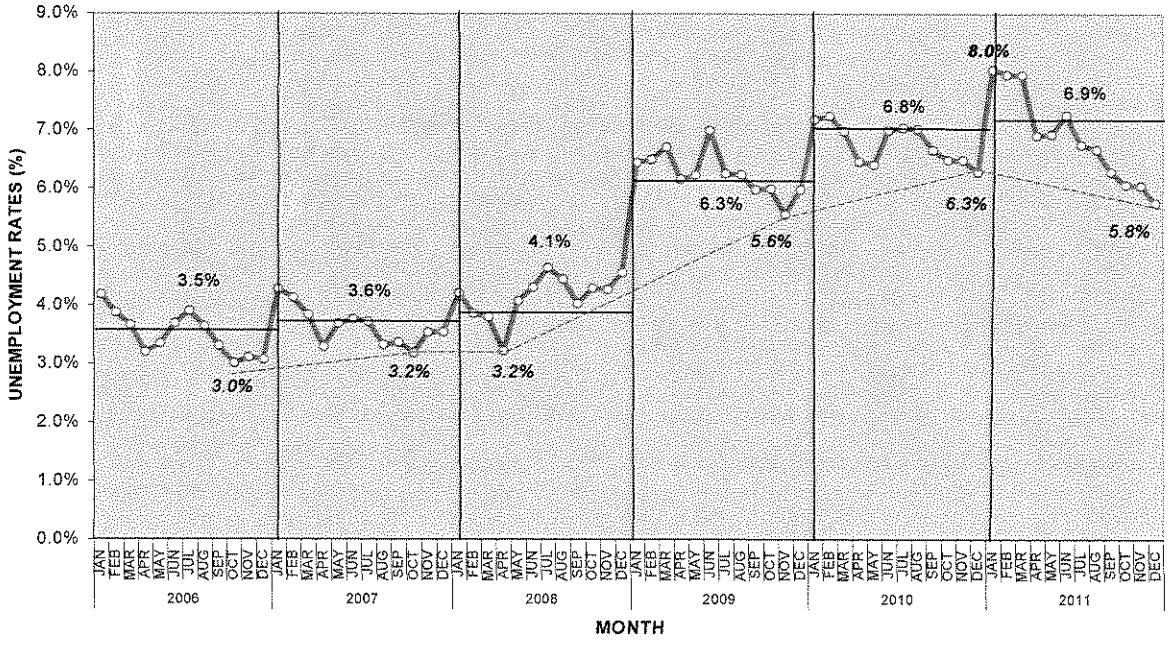
TABLE 4.2
MONTHLY UNEMPLOYMENT RATES FOR REGIONAL SCHOOL DISTRICT 13 RESIDENTS BETWEEN 2006 AND 2011

(The highest monthly unemployment rate in a year is shown in underlined bold and the lowest in bold figure.)

	2006		2007		2008		2009		2010		20011	
	Unemp	%	Unemp	%	Unemp	%	Unemp	%	Unemp	%	Unemp	%
JAN	**270**	**4.2%**	**282**	**4.3%**	281	4.2%	434	6.4%	481	7.2%	**544**	**8.0%**
FEB	251	3.9%	273	4.1%	257	3.9%	438	6.5%	**488**	**7.2%**	539	8.0%
MAR	238	3.7%	254	3.8%	254	3.8%	453	6.7%	471	7.0%	541	7.9%
APR	208	3.2%	217	3.3%	**215**	**3.2%**	417	6.2%	437	6.5%	469	6.9%
MAY	219	3.4%	245	3.7%	274	4.1%	422	6.2%	433	6.4%	471	6.9%
JUN	245	3.7%	253	3.8%	293	4.3%	**481**	**7.0%**	478	7.0%	497	7.3%
JUL	260	3.9%	250	3.7%	**317**	**4.6%**	427	6.3%	482	7.0%	460	6.7%
AUG	241	3.6%	221	3.3%	301	4.4%	423	6.2%	479	7.0%	454	6.7%
SEP	217	3.3%	223	3.4%	270	4.0%	401	6.0%	451	6.7%	426	6.3%
OCT	**199**	**3.0%**	**212**	**3.2%**	291	4.3%	404	6.0%	441	6.5%	415	6.1%
NOV	206	3.1%	237	3.5%	289	4.3%	**373**	**5.6%**	440	6.5%	415	6.1%
DEC	203	3.1%	236	3.5%	306	**4.6%**	399	6.0%	**423**	**6.3%**	**390**	**5.8%**
Annual Avg.	230	3.5%	242	3.6%	279	4.1%	423	6.3%	459	6.8%	468	6.9%

Source: Connecticut Department of Labor

FIG. 4-3
TREND OF MONTHLY UNEMPLOYMENT RATE,
REGIONAL SCHOOL DISTRICT 13, 2006-2011



4.6 Births Assumption

In order to prepare ten-year enrollment projections, we have to establish assumptions on the number of births over the next five years between 2012 and 2016 so that we can project kindergarten enrollments for the years 2017 through 2021. Table 4.3 presents the estimated

number of births by applying various past trends including the 3-, weighted 5- and 5-year average trends of various growth factors. As expected, the 3-year trend projected low births, the weighted 5-year trend produced middle births and the 5-year trend projections yielded high births. (Note that we did not include weighted 3-year and 10-year trend projections because they are likely to yield the lowest and highest birth estimates: we wanted to eliminate extreme scenarios.) Finally, we derived the 'middle' birth estimates by averaging the low and high births estimates.

FIG. 4-4
BIRTH TRENDS AND PROJECTIONS FOR DURHAM, MIDDLEFIELD
AND REGIONAL SCHOOL DISTRICT 13, 1984-2011 (HISTORY)
AND 2012-2016(PROJECTIONS)

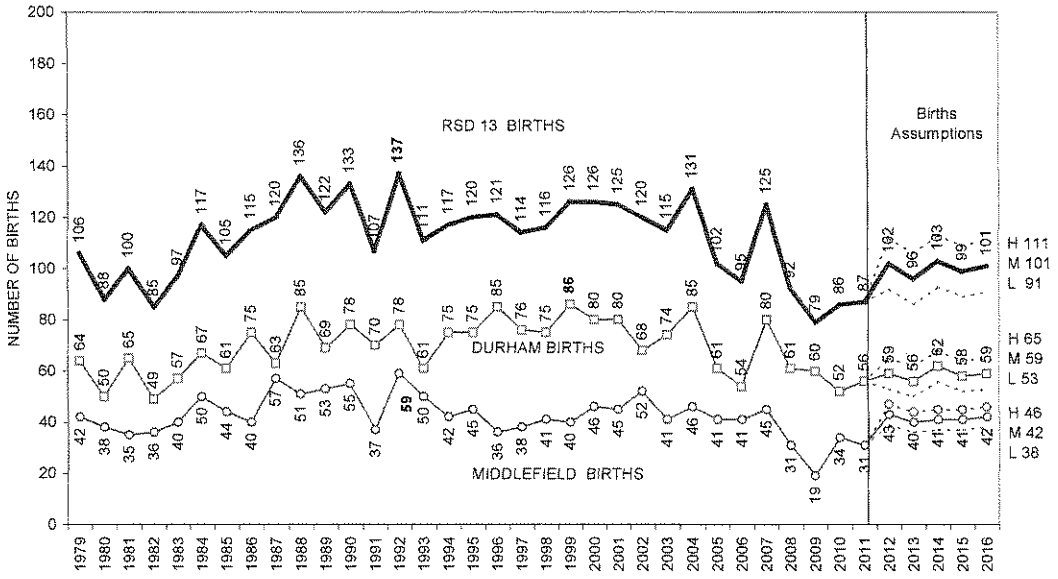


Table 4.3
ESTIMATED NUMBER OF BIRTHS IN REGIONAL SCHOOL DISTRICT 13
BASED ON PAST BIRTHS TRENDS, 2012-2016

	Births Level	2012	2013	2014	2015	2016
R.S.D. 13	Low	92	86	93	89	91
	Middle	**102**	**96**	**103**	**99**	**101**
	High	112	106	113	109	111
Durham	Low	53	50	56	52	53
	Middle	**59**	**56**	**62**	**58**	**59**
	High	65	62	68	64	65
Middlefield	Low	39	36	37	37	38
	Middle	**43**	**40**	**41**	**41**	**42**
	High	47	44	45	45	46

Observe that the low, middle and high projections are based on the 3-, weighted 5- and 5-year trends. Although the differences among these estimated births are not too large, we are dealing with small enrollment figures, and the cumulative effects of these small numbers as they pass through grades K through 12 will be considerable in enrollment projections. Therefore, we have

adopted the middle births projections for enrollment projection purposes. Note also that the estimated births exhibit minimal annual fluctuations but it is expected that the actual future births will have larger annual fluctuations due to the cyclical nature of the changing economy as shown by past examples.

This birth assumption is consistent with the findings of the population projections by the Connecticut Data Center in that they indicate that the number of childbearing-age females aged 15 to 49 years old is projected to decrease slightly from 2,564 women in 2010 to 2,360 women in 2020, a decrease of 204 persons (-8%). *

4.7 Assumptions on Inter-Grade Survival Ratios

Once the number of births is projected, we need applicable inter-grade survival ratios in order to convert the births into kindergarten enrollment, and then convert K enrollments into upper grade enrollments. The inter-grade survival ratios define in major part the net migration rates of school age children and also the extent of Durham and Middlefield residents opting for nonpublic schools as they progress from lower to upper grades.

Table 4.4 below presents five sets of inter-grade survival ratios (called also progression or retention). This is a reproduction of Table 3.3 in Section 3 of this report. In order to calculate the K enrollment of a given year, the B to K ratios are multiplied to the number of births from five years prior. (This is fully discussed in Section 6). Once the kindergarten enrollments are forecast, we convert K enrollments into 1st grade, 2nd grade, and 3rd grade and so forth up to 12th grade enrollments by applying the corresponding inter-grade ratios.

TABLE 4.4
LOW AND HIGH INTER-GRADE SURVIVAL RATIOS
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCOOLS, 2000 – 2009

Averages	K	1	2	3	4	5	6	7	8	9	10	11	12
3-YR	1.059	1.103	0.996	1.034	1.005	0.989	0.983	0.998	1.000	0.834	0.988	1.005	0.967
5-YR	1.109	1.118	1.004	1.022	1.010	0.996	0.977	0.994	1.005	0.826	0.984	1.002	0.947
10-YR	1.169	1.112	1.017	1.014	1.021	1.003	0.981	1.010	1.007	0.857	0.967	0.986	0.973
W. 3-YR	1.075	1.094	0.990	1.039	1.005	0.989	0.977	0.996	1.001	0.838	0.988	1.009	0.975
W. 5-YR	1.097	1.109	0.998	1.031	1.007	0.992	0.978	0.996	1.003	0.831	0.987	1.005	0.960

Table 4-4 and Figure 3-3 in Section 3 also illustrate that in most cases the inter-grade ratios of 3-year trend are lower than those of the ratios for the 10-year trend while the 5-year ratios are situated between the high and low ratios. Accordingly, the application of the 3-year trend ratios is expected to produce low enrollment projections due to an assumed low net in-migration of school children while the 10-year coefficients will result in high enrollment projections due to an assumed higher net in-migration of school-age children.

* See Table 2.2 on page 2-4.

4.8 Land Use and Educational Policy Assumptions

In addition, we assumed there would be no significant changes in education policies over the next ten years. That is, the Regional School District #13 public schools will continue to operate full-day kindergarten programs and there will be no significant changes in the K retention policy, pre-K enrollment programs, and charter/magnet schools. It is also assumed that there will be no change in the school capacities. Finally, we assumed that the Town of Regional School District #13 would maintain its current land use policies, instituting no significant changes in zoning and subdivision regulations.

4.9 Summary

All projections are based on underlying assumptions and these assumptions determine projection results to a large extent. Various alternative projections are presented in this report. These alternatives reveal the level of uncertainty involved in making projections, and they also exhibit the sensitivity of projections to the assumptions on which they are based. It is important that users of projections understand the assumptions to choose the best set of projections for their purposes from the many projections presented in this report.

APPENDIX TABLE 4-A

TABLE OF BIRTH-YEAR COHORTS

BIRTH YEAR	RSD 13 BIRTHS	SCHOOL YEAR	K	1	2	3	4	5	6	7	8	9	10	11	12
1991	107	1996	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979
1992	137	1997	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980
1993	111	1998	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981
1994	117	1999	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982
1995	120	2000	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983
1996	121	2001	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984
1997	114	2002	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985
1998	116	2003	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986
1999	126	2004	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
2000	126	2005	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988
2001	125	2006	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989
2002	120	2007	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990
2003	115	2008	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991
2004	**131**	2009	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992
2005	102	2010	**2005**	2004	2003	2002	2001	**2000**	1999	**1998**	1997	**1996**	1995	1994	1993
2006	95	2011	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994
2007	125	2012	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995
2008	92	2013	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996
2009	79	2014	**2009**	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997
2010	86	2015	2010	**2009**	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998
2011	87	2016	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
2012	*102*	2017	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
2013	*96*	2018	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
2014	*103*	2019	2014	2013	2012	2011	2010	**2009**	2008	**2007**	2006	**2005**	2004	2003	2002
2015	*99*	2020	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
2016	*101*	2021	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004

Projected enrollments affected by low births for four years between 2008 and 2011.

Projected enrollments affected by estimated or assumed births.

SECTION 5
10-YEAR ENROLLMENT PROJECTIONS
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOLS

5.1 Regional School District 13 Public School Enrollment Projections

In this section, we finally present the 10-year enrollment projections for the Regional School District 13 public schools. We also projected enrollments separately for Durham and Middlefield. Three methods were used in forecasting K-12 enrollments: (1) the Cohort Survival Method, (2) the Share Ratio Method, and (3) the Multiple-Regression Method.

Note that all projections are made as of October 1 of each school year. The cohort survival method and the share ratio method projections are made based on 3-, 5-, and 10-year trends of school enrollments by grade, whereas the multiple-regression method projections are made based on the enrollment trends of 20 or more years.

5.2 Importance of Kindergarten Enrollment

The enrollment projections for grades K through 12 are derived from forecasts of the size of entering kindergarten classes. In order to form an accurate forecast of kindergarten enrollments, information about the number of births that occurred five years ago is necessary. However, birth data alone are not sufficient because over a period of five years some of the preschool children born in Regional School District 13 will leave the town, and other preschool children born elsewhere will migrate into Regional School District 13. The size of the net migration varies each year and is dependent on economic conditions in Regional School District 13 and in Connecticut. In addition, the number of children attending non-public kindergarten schools varies each year. Although projections of kindergarten enrollments are most important, they are also problematical to forecast.

5.3 Components of Kindergarten Enrollments

Annual kindergarten enrollment is a result of various components that make up K enrollment as shown below:

[5.1] K enrollment = Adjusted births five years ago - kindergartners in nonpublic schools + the number of kindergartners retained + the *net number* of preschool children who moved in and out of a school district during the past five years.

Table 5.1 below illustrates the components of annual kindergarten enrollments including the number of births five years ago, the number of kindergartners in nonpublic schools, and the cumulative net in-migration of preschool and kindergarten-age children during the five years prior to their entry into kindergarten classes.

TABLE 5.1
COMPONENTS OF ANNUAL KINDERGARTEN ENROLLMENT
AS OF OCTOBER 1, 2012-2021
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOLS

School Year	Adj. Births 5 YRS AGO* (1)	Non-Public K (2)	K Retention (est.) (3)	Estimated Net In-Migration (4)	Public K (5)	Annual K Enrollment Change (6)	Excess K Over B (7)	K/B Ratio*** (8)
2001	120	5	2	36	153	--	33	1.273
2002	114	5	2	37	148	-5	34	1.293
2003	117	1	2	28	146	-2	29	1.247
2004	126	1	2	33	160	14	34	1.273
2005	126	5	2	25	148	-12	22	1.176
2006	124	4	2	29	151	3	27	1.213
2007	120	5	2	14	131	-20	11	1.095
2008	117	3	2	33	149	18	32	1.274
2009	127	5	2	-6	118	-31	-9	0.927
2010	102	4	2	25	125	7	23	1.224
2011	99	5 (est.)	2	5	101	-25	1	1.015
2002-2011								
3-Yr. Average	109	5	2	8	114	-16	5	1.055
5-Yr. Average	113	4	2	14	125	-10	12	1.107
10-Yr. Average	117	4	2	22	138	-5	20	1.174
W. 3-Yr. Avg.	105	5	2	9	111	-15	7	1.070
W. 5-Yr. Avg.	**109**	**4**	**2**	**12**	**119**	**-12**	**10**	**1.093**
10-Yr. Maximum	127	5	2	37	160	18	34	1.293
10-Yr.Minimum	99	1	2	-6	100	-31	-9	0.927
10-Yr, Range	29	4	0	43	60	49	44	0.367
Median	118	5	2	27	147	-4	25	1.219

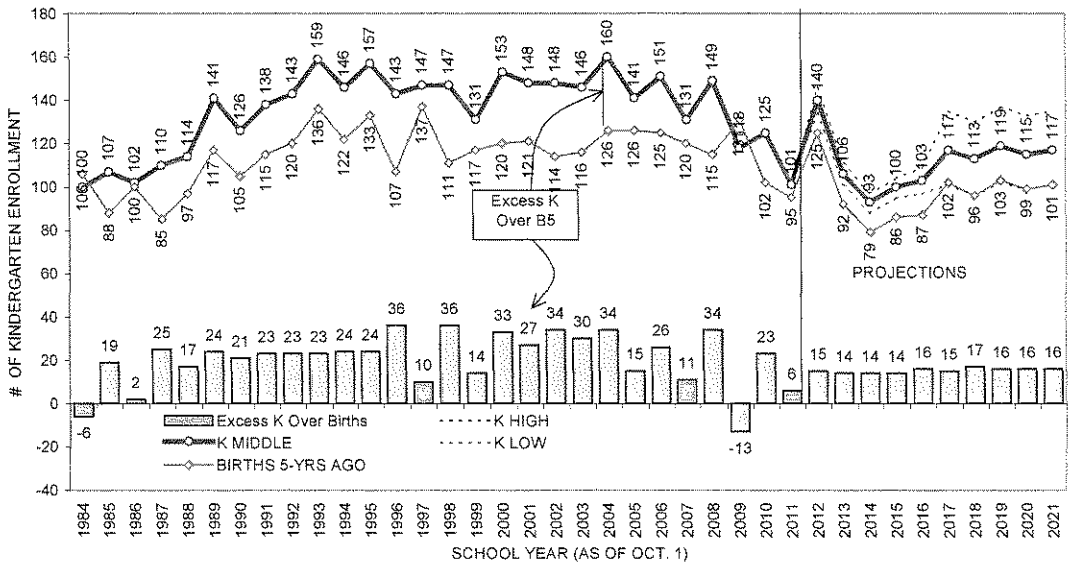
*3% born six years ago, 86% born five years ago, and 11% four years ago. ** Based on the data from the Regional School District 13 Public Schools.
K Enrollment (T) = Adjusted births 5 years ago (B5) – Nonpublic School K Enrollment + K pupils retained + Net Migration
*** These ratios may be off due to computer rounding. Actual calculations include numerical digits after the decimal point.

(a) Adjustment to births 5 years prior (Column 1); According to the data supplied by the Regional School District 13 Public Schools, on average 11% of kindergartners were four years old, 86% of kindergartners were five years old and 3% were six years old as of October 1 of the last two school years. When we forecast the kindergarten enrollments, we adjusted the number of births in accordance with these percentages.

(b) Kindergartners in Nonpublic Schools (Column 2): Kindergarten enrollment in each year is also affected by the number of kindergartners attending nonpublic schools. Table 5.1 (column 2) shows the number of kindergartners attending nonpublic schools since 2001 (see Appendix Table 2.8a). Observe that the *number* of RSD 13 kindergartners in nonpublic schools has been rather small,

averaging fewer than 5 students during the last ten years (since 2001). Although they are small in number, the impact of these RSD 13 kindergarten students attending private/parochial schools will constitute nearly 5% of RSD 13's public school enrollments.

FIG. 5-1
REGIONAL SCHOOL DISTRICT 13 KINDERGARTEN ENROLLMENT
LOW, MIDDLE AND HIGH PROJECTIONS, 2012-2021



(c) Net Migration of Preschool and Kindergarten-Age Children (Column 4): Although the historical data for births and nonpublic school enrollments are available from various sources, there are no sources which supply the data on net migration of pre-K and kindergarten age children for each year. However, as shown in Table 5.1 (column 4), we can estimate the cumulative net in- or out-migration of pre-school children during the five years prior to their entry into kindergarten classes. Rearranging Equation5.1, we can derive Formula 5.2:

[5.2] Net Migration of K = Actual K enrollment - Adj. Births - K retention + Nonpublic K

During the past ten years between 1984 and 2011, annual K enrollments were greater than the number of births five years earlier (B5) because there was mostly a net *in*-migration of preschool children into Regional School District 13 during each school year. Nonetheless, as shown in Figure 5-1 above, the number of excess K over B5 (which equals roughly the net in-migration of preschool children during the five years preceding their entry to the public school K program) fluctuated considerably. There was an excess K over B5 of 36 K students enrolled at Regional School District 13 public schools in 1996 and 1998. But this number fluctuated substantially from year to year, dropping to even -8 students in 2009 (net out-migration) while rising to 5 excess students

over B5 in 2011. Accordingly, the number of excess K enrollments over the number of births five years ago (B5) (Table 5.1, column 7) are quite similar to the estimated net migration of preschool children shown in Table 5.1, column 4. Note also that we calculated the K/B ratios, annual K enrollments divided by births from five years ago.

In equation 5.3 shown below, the K/B ratio in a given year T is negatively affected by B(-5), the number of births five years ago, but positively correlated to HSALE(T), the number of home sales in the year T. It is also negatively impacted by the time variable T: the equation results imply that the long-term trend of K/B ratios has been negative. The K/B ratios since 1988 have been in decline in part because home sales were on the rise but when the home sales in Regional School District 13 dwindled over the past two years, so did the K/B ratios. If the weak economy persists, then home sales will suffer and so will the K/B ratios. In contrast, if we assume the economy recovers soon, home sales will also surge as will the K/B ratios so that there will be a higher net in-migration of kindergarteners into Regional School District 13.

[5.3] KBRATIO(T)= 2.562171 - 0.011052B(-5) + 0.002273 HSALE(T) -0.011826 T (1988-2011)

(13.78) (-5.05) (3.16) (-2.61)

R^2 = 0.729 SEE = 0.109 D.W. = 1.94 MVD = 1.257

5.4 Annual K Enrollment Changes

In general, Kindergarten enrollment grows and declines annually as a result of variations in the number of births, nonpublic school enrollments, and the size of net migration. Since these factors vary a great deal annually, the actual kindergarten enrollments also vary considerably from year to year. Observe from Table 5.1 (column 6) that in the past ten years (between 2000 and 2009), Regional School District 13's K enrollments declined in six years losing 160 students, but increased in four years gaining 97 students, so that there was a net reduction in K enrollments of 63 students between 1999 and 2009.

5.5 Kindergarten Enrollment Projections

Recognizing the importance and difficulty of producing reliable kindergarten enrollment projections, we applied three methods of projecting kindergarten enrollments: (1) the K Enrollment Component Method; (2) the K/B Ratio Method; and (3) the multiple regression method. The K component method and the K/B ratio method are demonstrated in Table 5.2.

TABLE 5.2
ANNUAL KINDERGARTEN ENROLLMENT PROJECTIONS BY THE COMPONENT METHOD
AS OF OCTOBER 1, 2012-2021, REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOLS

Assumptions: Flat births and constant weighted 5-year K/B Ratios, nonpublic K, and net migration.

	Adj. Birth 5-YRS AGO (Projected (1)	Assumed Non-Public K (2)	Assumed K Retention (3)	Assumed Net Migration (4)	**Projected Public School K (5)**	Annual K Enrollment Change (6)	Annual B -to-K Change (7)	K/B Ratio (8)	Projected K By K/B method (9)
W. 5-Yr. Avg.	109	4	2	12	119	-12	10	1.093	109
PROJECTIONS:									
2012	125	4	2	12	135		10	1.078	135
2013	92	4	2	12	102	-33	10	1.106	102
2014	79	4	2	12	89	-13	10	1.124	89
2015	86	4	2	12	96	7	10	1.114	96
2016	87	4	2	12	97	1	10	1.112	97
2017	102	4	2	12	112	15	10	1.096	112
2018	96	4	2	12	106	-6	10	1.102	106
2019	103	4	2	12	113	7	10	1.095	113
2020	99	4	2	12	109	-4	10	1.099	109
2021	101	4	2	12	111	2	10	1.097	111

Total Resident K = (Public K + Nonpublic K) = (Adj. Births 5 Yrs prior + Net Mig. + Retention)

(a) K Projections by the B-to-K Component Method: Table 5.2 illustrates how K enrollments over the next ten years are projected by the K enrollment component method. Note that column 5 presents the projected K enrollments. In column 1, we applied the 'flat' or middle-level births but low and high births can be also used. Next, based on the weighted 5-year trend averages, we adopted assumptions that nonpublic school K enrollment would remain constant at 4 students (Col. 2), K retention at 2 students (Col. 3), and net in-migration of preschool children at 12 students (Col. 4). Based on these assumptions, we derived projected K enrollments over the next ten years, between 2012 and 2021. The resulting projections show that K enrollments are projected to fluctuate approximately + 10% or ten students annually, that is, between 90 to 110 students according to 'middle' projections.

(b) K Projections by the K/B Ratio Method: As shown in Table 5.2 (column 8), we can calculate the K/B ratio (K over B) for each year. We can then also calculate 3-, 5-., 10, weighted 3-, and weighted 5- year average K/B ratios and apply these ratios for projecting future K enrollments. In Table 5.2 we applied the W. 5-year K/B ratio to the adjusted births 5-year prior to the projection school year. For projection purposes, a constant 1.093 K/B ratio (W. 5-year trend) and net in-migration of 12 K children per year are assumed. Both methods produced identical projections as shown by Table 5-2's columns 5 and 9.

(c) K Projections by Multiple Regression Equations: K enrollments were also projected applying the regression equations developed in this report (see Equation 3.1 in Section 4). Assuming that the

past relationships among the variables in Equation 3.1 remain the same over the next ten years and that assumptions for independent variables are valid, future enrollments were projected by applying the regression equation developed in Report 3. *The MRM method does not necessarily produce more accurate projections, but it has the advantage of providing information on the probability statistics so it helps to tell how reliable the projections are, based on past trends.* Results of these K projections are shown in Table 5.3 below. The resulting projections that K enrollments are projected to decline from 100 pupils in 2011 to 92 pupils in 2016; afterwards, enrollments will gradually increase to 113 K enrollments in 2021.

5.6 District-Wide Enrollment Projections by the Multiple Regression Method

We applied three different methods: (1) the Multiple Regression Method (MRM); (2) the Cohort-Survival Method (CSM); and (3) the Share-Ratio Method (SRM) in projecting the Regional School District 13 school district-wide enrollment projections by grade.

Enrollment Projections by the Multiple Regression Method: Table 5.3 below shows the RSD 13 enrollment projections by the Multiple Regression Method (MRM). The MRM enrollment projections by grade level were derived by applying the regression equations from Section 3. Note that the MRM projections are prepared applying the long-term trend between 1984 and 2011.

TABLE 5.3
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOL ENROLLMENT PROJECTIONS
BY MULTIPLE REGRESSION METHOD, 2012-2021

Assumption: Middle births

	K	K-4	5-8	9-12	K-12
2011	101	696	683	582	1961
2012	109	628	678	583	1889
2013	90	683	654	573	1910
2014	106	637	624	575	1836
2015	95	649	589	555	1793
2016	92	620	559	544	1723
2017	95	578	572	514	1664
2018	98	634	554	496	1684
2019	105	581	551	476	1608
2020	106	587	524	448	1559
2021	113	642	522	466	1630
Changes:					
2011-16	-9	-66	-124	-38	-238
2016-21	21	22	-37	-78	-93
2011-21	12	-44	-161	-116	-331
2011-16	-8.9%	-9.5%	-18.2%	-6.5%	-12.1%
2016-21	22.8%	3.5%	-6.6%	-14.3%	-5.4%
2011-21	11.9%	-6.3%	-23.6%	-19.9%	-16.9%

Note in Table 5.3 that the K and K-4 enrollment ..projections by the MRM method is similar to the Middle projections prepared by the Cohort Survival Method (see Table 5.5). On the other hand, the grades 5-8 and 9-12 projections by MRM are somewhat higher than the projections by CSM.

5.7 Cohort Survival Method Enrollment Projections

(a) Enrollment Projections by CSM: Table 5.4 presents enrollment projections applying the Cohort Survival Method (CSM). In this table, the low projections are prepared applying the low births and 3-year trend average survival ratios. The middle projections are based on the 'flat' middle-level births and survival ratios that are averages of 3-year trend (low) and 10-year trend (high) ratios. The high projections were derived by the application of relatively high births and 10-year trend survival ratios.

(b) K Enrollment Projections: As illustrated by Figure 5-1 on page 5-3, it is clear that the historical K enrollments since 1984 are roughly parallel to the number of births five years earlier. Observe that the Regional School District 13's K enrollments peaked in 2004 with 160 K students, then began to decline and dropped to 101 students in 2011. Enrollments are then forecast to regain 39 kindergartners within one year to reach 140 K students in 2012. However, K enrollment is afterwards projected to decline once again to 106 students in 2013 and 93 students in 2014. It isn't until after 2014 that K enrollments in RSD 13 will start to increase to 100 K in 2015 and then grow to 117 students in 2021. In sum, K enrollments are projected to gain 2 students (1.7%) in the first five years, and to add 15 more students (14.2%) over the second five years of projections (see Table 5.5 Middle Projections). Under the *low* births scenario, K enrollments are projected to resume their descent to 97 students in 2016 which is consistent with the declining births (B5) trend, growing slightly to 102 students in 2019 and to 101 students in 2021. In contrast, under the high births scenario, K enrollments will be increase to 146 students in 2012, then quickly decline to 109 students in 2016 but then increase again to 135 K students in 2017, remaining more or less at this level until 2021. Note that the second five-year K enrollment projections are based on the projected births and are therefore less reliable than the K enrollment projections for the first five years, which were prepared with actual births.

TABLE 5.4
DURHAM AND MIDDLEFIELD ENROLLMENT PROJECTIONS BY GRADE LEVEL
BY THE MODIFIED COHORT SURVIVAL METHOD, 2012-2021

(a) DURHAM Enrollment Projections

Low Projections (Low Births/ 3-Yr. Trend)

	K	K-4	5-6	7-8	9-12*	K-12
2011	69	453	224	233	387	1297
2012	84	449	222	215	385	1271
2013	67	413	221	219	370	1223
2014	65	413	196	218	369	1196
2015	58	391	172	216	372	1151
2016	61	381	175	193	356	1106
2017	58	350	183	168	359	1060
2018	56	337	181	172	338	1027
2019	61	331	157	179	317	984
2020	57	331	146	177	300	954
2021	58	327	141	154	286	909
Changes:						
2011-16	-8	-72	-49	-40	-31	-191
2016-21	-3	-54	-34	-39	-70	-197
2011-21	-11	-126	-83	-79	-101	-388
2011-16	-11.8%	-15.9%	-21.7%	-17.2%	-8.0%	-14.8%
2016-21	-4.6%	-14.1%	-19.3%	-20.1%	-19.7%	-17.8%
2011-21	-15.9%	-27.7%	-36.9%	-33.8%	-26.1%	-29.9%

Middle Projections (Middle Births/Middle Proj.)

	K	K-4	5-6	7-8	9-12*	K-12
2011	69	453	224	233	387	1297
2012	89	454	223	216	385	1277
2013	71	421	222	222	369	1235
2014	68	426	197	221	370	1214
2015	61	407	172	220	377	1176
2016	65	402	176	196	362	1136
2017	67	376	189	170	366	1102
2018	65	369	191	175	345	1080
2019	71	371	166	187	323	1048
2020	67	379	154	190	307	1030
2021	68	383	150	165	297	995
Changes:						
2011-16	-4	-51	-48	-37	-25	-161
2016-21	3	-19	-26	-31	-65	-141
2011-21	-1	-70	-74	-68	-90	-302
2011-16	-6.3%	-11.3%	-21.3%	-15.9%	-6.5%	-12.4%
2016-21	4.9%	-4.6%	-14.9%	-15.9%	-17.9%	-12.4%
2011-21	-1.7%	-15.4%	-33.0%	-29.2%	-23.3%	-23.3%

High Projections (High Births/9-Year Trend)

	K	K-4	5-6	7-8	9-12*	K-12
2011	69	453	224	233	387	1297
2012	93	459	223	217	384	1283
2013	74	430	223	224	369	1246
2014	71	439	198	224	371	1232
2015	64	423	173	223	381	1200
2016	69	422	177	199	367	1166
2017	78	402	195	173	373	1144
2018	76	404	201	178	351	1134
2019	81	414	175	195	330	1114
2020	77	431	162	202	313	1108
2021	78	443	159	176	308	1085
Changes:						
2011-16	0	-31	-47	-34	-20	-131
2016-21	10	20	-18	-23	-59	-81
2011-21	9	-10	-65	-57	-79	-212
2011-16	-0.6%	-6.8%	-20.8%	-14.6%	-5.1%	-10.1%
2016-21	14.2%	4.8%	-10.4%	-11.8%	-16.2%	-6.9%
2011-21	13.6%	-2.3%	-29.0%	-24.6%	-20.4%	-16.3%

(b) MIDDLEFIELD Enrollment Projections

Low Projections (Low Births/ 3-Yr. Trend)

	K	K-4	5-6	7-8	9-12*	K-12
2011	32	243	101	125	195	664
2012	49	237	115	112	195	659
2013	34	222	105	103	207	637
2014	24	191	105	116	189	601
2015	38	185	98	106	185	575
2016	36	190	76	106	185	557
2017	43	182	83	99	171	535
2018	41	190	85	77	181	533
2019	42	209	59	84	167	519
2020	42	214	62	86	148	510
2021	43	221	75	60	148	504
Changes:						
2011-16	4	-53	-25	-19	-10	-107
2016-21	7	31	-1	-46	-37	-53
2011-21	11	-22	-26	-65	-47	-160
2011-16	12.6%	-21.9%	-24.5%	-15.3%	-5.0%	-16.1%
2016-21	19.1%	16.6%	-1.4%	-43.8%	-20.0%	-9.5%
2011-21	34.1%	-9.0%	-25.6%	-52.4%	-24.0%	-24.1%

Middle Projections (Middle Births/Middle Proj.)

	K	K-4	5-6	7-8	9-12*	K-12
2011	32	243	101	125	195	664
2012	51	240	115	112	195	663
2013	36	228	108	102	207	644
2014	25	198	107	116	189	611
2015	39	194	100	109	185	588
2016	38	202	79	108	186	574
2017	50	198	89	101	172	560
2018	47	211	93	79	183	566
2019	48	237	64	89	171	561
2020	48	247	68	93	152	561
2021	49	259	82	65	155	561
Changes:						
2011-16	6	-41	-22	-17	-9	-90
2016-21	11	58	4	-43	-31	-13
2011-21	17	16	-19	-60	-40	-103
2011-16	19.0%	-17.1%	-22.0%	-13.7%	-4.6%	-13.5%
2016-21	30.0%	28.7%	4.5%	-40.1%	-16.7%	-2.3%
2011-21	54.7%	6.7%	-18.4%	-48.3%	-20.6%	-15.5%

High Projections (High Births/9-Year Trend)

	K	K-4	5-6	7-8	9-12*	K-12
2011	32	243	101	125	195	664
2012	53	243	116	113	195	667
2013	37	233	110	102	208	652
2014	26	206	109	116	190	621
2015	41	204	102	111	185	602
2016	40	213	81	110	187	591
2017	57	215	95	103	174	586
2018	54	233	100	82	185	600
2019	55	266	69	95	174	605
2020	55	282	74	101	156	613
2021	56	300	90	70	162	621
Changes:						
2011-16	8	-30	-20	-15	-8	-73
2016-21	16	87	8	-40	-25	30
2011-21	24	57	-11	-55	-33	-43
2011-16	25.5%	-12.2%	-19.4%	-12.1%	-4.3%	-10.9%
2016-21	40.7%	40.8%	10.2%	-36.5%	-13.5%	5.1%
2011-21	76.5%	23.6%	-11.2%	-44.2%	-17.1%	-6.4%

TABLE 5.5
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOLS ENROLLMENT PROJECTIONS BY GRADE LEVEL
THE MODIFIED COHORT-SURVIVAL METHOD, 2012-2021

(A) RSD 13 Enrollment Projections

Low Projections (Low Births/ 3-Yr. Trend)

	K	K-4	5-6	7-8	9-12*	K-12
2011	101	696	325	358	582	1961
2012	134	687	337	327	580	1930
2013	101	635	326	322	577	1860
2014	88	604	301	334	558	1797
2015	95	576	270	323	558	1726
2016	97	571	252	299	541	1663
2017	101	532	266	267	530	1595
2018	96	526	266	249	518	1559
2019	102	540	216	263	484	1503
2020	99	545	208	263	449	1465
2021	101	548	217	214	434	1413
Changes:						
2011-16	-4	-125	-73	-59	-41	-298
2016-21	4	-22	-35	-85	-107	-250
2011-21	0	-148	-108	-144	-148	-548
2011-16	-4.1%	-18.0%	-22.6%	-16.5%	-7.0%	-15.2%
2016-21	4.2%	-3.9%	-13.9%	-28.5%	-19.8%	-15.0%
2011-21	-0.1%	-21.2%	-33.4%	-40.3%	-25.4%	-27.9%

Middle Projections (Middle Births/Middle Proj.)

	K	K-4	5-6	7-8	9-12*	K-12
2011	101	696	325	358	582	1961
2012	140	694	338	328	580	1940
2013	106	649	330	324	577	1879
2014	93	624	304	337	559	1825
2015	100	601	272	328	562	1764
2016	103	603	255	304	548	1710
2017	117	574	278	271	539	1662
2018	113	581	283	255	527	1646
2019	119	608	230	277	494	1609
2020	115	626	222	283	459	1590
2021	117	643	233	230	452	1556
Changes:						
2011-16	2	-93	-70	-54	-34	-251
2016-21	15	39	-23	-74	-96	-154
2011-21	16	-53	-92	-128	-130	-405
2011-16	1.7%	-13.3%	-21.5%	-15.1%	-5.9%	-12.8%
2016-21	14.2%	6.5%	-8.9%	-24.5%	-17.5%	-9.0%
2011-21	16.2%	-7.7%	-28.4%	-35.9%	-22.4%	-20.6%

High Projections (High Births/9-Year Trend)

	K	K-4	5-6	7-8	9-12*	K-12
2011	101	696	325	358	582	1961
2012	146	702	339	330	580	1951
2013	111	662	333	326	577	1898
2014	97	645	307	341	560	1853
2015	104	627	275	334	566	1802
2016	109	636	259	309	554	1758
2017	135	617	290	276	547	1730
2018	130	637	301	260	536	1734
2019	137	680	244	291	504	1719
2020	133	713	236	303	470	1721
2021	135	743	249	245	470	1707
Changes:						
2011-16	8	-60	-66	-49	-28	-203
2016-21	26	107	-10	-64	-85	-51
2011-21	34	47	-76	-113	-112	-254
2011-16	7.7%	-8.7%	-20.3%	-13.7%	-4.8%	-10.4%
2016-21	24.0%	16.9%	-3.9%	-20.6%	-15.3%	-2.9%
2011-21	33.5%	6.8%	-23.5%	-31.5%	-19.3%	-13.0%

(B) Low and High Projection Deviations from the Middle Projections in Percent

Low Projections Differences from the Middle

	K	K-4	5-6	7-8	9-12*	K-12
2011	0%	0%	0%	0%	0%	0%
2012	-4%	-1%	0%	0%	0%	-1%
2013	-4%	-2%	-1%	-1%	0%	-1%
2014	-4%	-3%	-1%	-1%	0%	-2%
2015	-4%	-4%	-1%	-2%	-1%	-2%
2016	-5%	-5%	-1%	-2%	-1%	-3%
2017	-12%	-7%	-4%	-2%	-2%	-4%
2018	-12%	-9%	-6%	-2%	-2%	-5%
2019	-12%	-11%	-6%	-5%	-2%	-7%
2020	-12%	-13%	-6%	-7%	-2%	-8%
2021	-12%	-15%	-7%	-7%	-4%	-9%

Middle Projections (Middle Births/Middle Proj.)

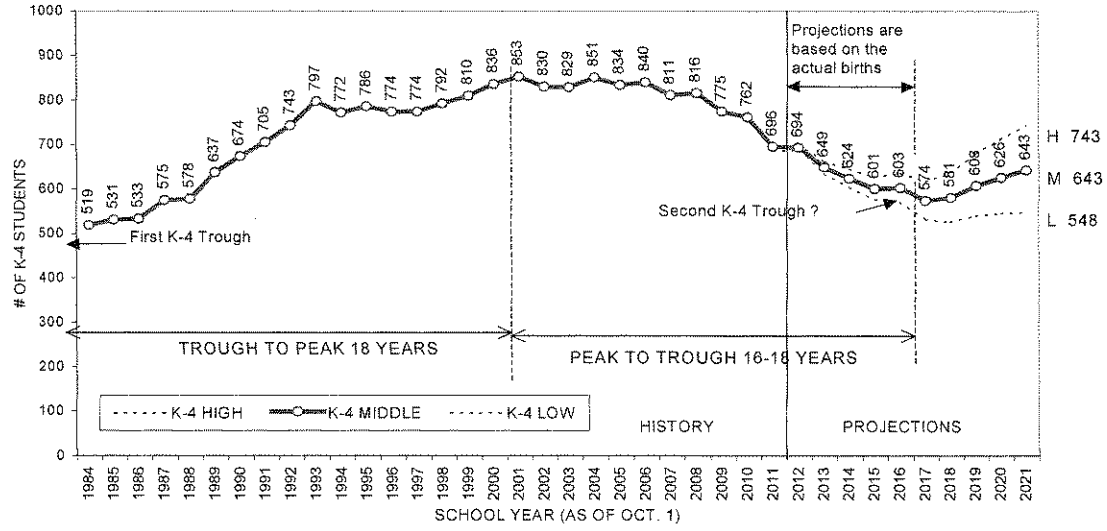
	K	K-4	5-6	7-8	9-12*	K-12
2011						
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
2021	0	0	0	0	0	0

High Projections Deviations from the Middle

	K	K-4	5-6	7-8	9-12*	K-12
2011	0%	0%	0%	0%	0%	0%
2012	4%	1%	0%	1%	0%	0%
2013	4%	2%	1%	1%	0%	1%
2014	5%	3%	1%	1%	0%	2%
2015	4%	4%	1%	2%	1%	2%
2016	6%	5%	1%	2%	1%	3%
2017	15%	7%	4%	2%	2%	4%
2018	15%	10%	6%	2%	2%	5%
2019	15%	12%	6%	5%	2%	7%
2020	15%	14%	6%	7%	2%	8%
2021	15%	16%	7%	7%	4%	10%

(c) K-4 Enrollment Projections: Table 5.5 and also Figure 5-2 present RSD 13's elementary school enrollment projections. According to the middle projections, K-4 enrollments in Regional School District 13 public schools began to decline from their peak enrollment of 853 K-4 students in 2001, reaching 689 students in 2011 after 11 years of uninterrupted annual decline. According to the Middle Projections, grades K-4 enrollment will resume its decline for five more years and reach 574 students in 2017, a reduction of 122 students (-17.%) in six years. Then elementary school enrollments are forecast to back up to 643 students in 2021 for the subsequent four years. In short, the grades K-4 enrollments are projected to lose 93 students over the first 5 years but gain 39 students over the second five-year period. All in all, the grades K-4 enrollments are projected to lose 53 students (-7.7%) over the next 10-year period.

FIG. 5-2
GRADES K-4 ENROLLMENT PROJECTIONS (LOW, MIDDLE AND HIGH) REGIONAL SCHOOL DISTRICT 13, CT, 2012-2021

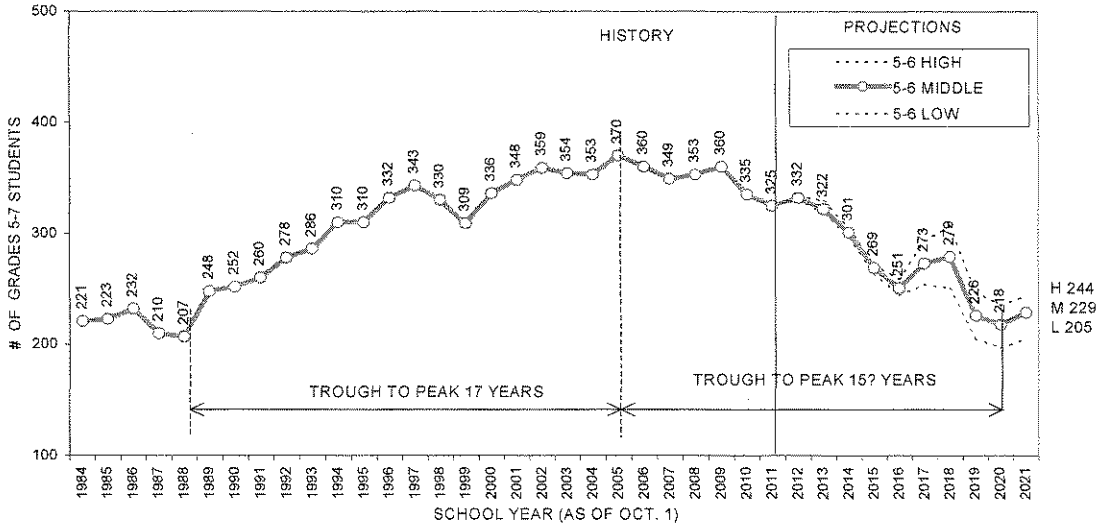


The differences of low and high projections from middle projections gradually increase from 1% in 2012 to +15% in 2021. In short, the margin of errors are significantly larger for the distant future because of large variations among the births assumptions we applied to low, middle and high projections as well as differences in the net migration of students. Thus, the low projections in the year 2021 are 105 students lower than the middle projections, and the high projections in 2021 are 100 students higher than the middle projections. *It is most likely that RSD 13's elementary school enrollments will continue to decline over the next five years although the pattern of enrollment changes in the second 5-year period is uncertain. Note also it is projected that the second K-4 enrollment trough will most likely to appear in 2017 so that the K-4 enrollments will complete a full enrollment cycle of 33 years. (If the 2nd trough will appear a year earlier o later, then, the full cycle could be 32 or 34 years.)*

(d) Grades 5-6 Enrollment Projections: The grades 5 and 6 enrollments started to decline from their peak enrollment of 365 students in 2005, reaching the enrollment of 325 students in 2011. According to the middle projections, in the first five years of the projections, the grades 5-6 enrollment will continue to decline to 255 students in 2016 (a loss of 70 students or 21.5%); this decline will then be interrupted for a couple years, but then the decline is projected to resume and reach a low point of 233 students in 2021, the loss of an additional 23 students over the second five year period. In sum, the grades 5-6 enrollment will be reduced by 92 students (-23.5%) over the next ten years.

The differences between the low and high enrollment projections are not considerably smaller than grades K-4: the low projections are 1% less than the middle projections for the first 5 years, but increased to -4% in 2016 and -7% in 2021, producing higher enrollment discrepancies in the second five years. Similarly, the high projections are only 1% larger than the middle projections and 4 to 7% larger than the middle projections in the second five years. In sum, under the high projections, the grades 5-6 enrollments are forecast to decline by 76 students (-23.5%) while the low projections are forecast to lose 108 students (-33.4%) or one third of its 2011 enrollments.

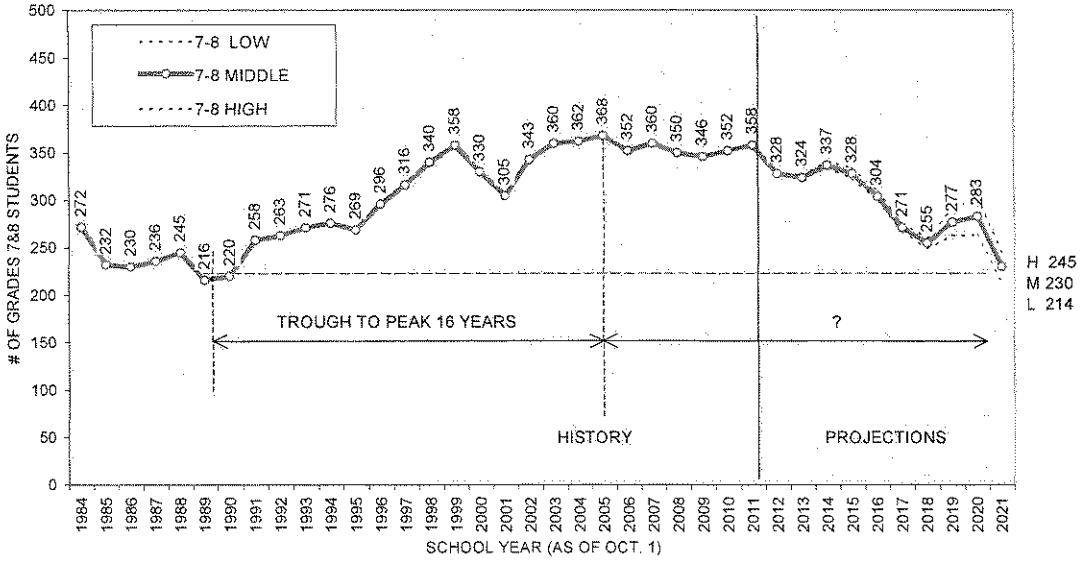
FIG. 5-3
GRADES 5&6 ENROLLMENT PROJECTIONS
REGIONAL SCHOOL DISTRICT 13, CT, 2012-2021



(e) Grades 7-8 Enrollments: The upper level middle school enrollments attained their peak enrollment of 365 students in 2005, but instead of declining, they remained at around the 350-student level for seven years and reached at 358 students 2011. From then on, the grades 7-8

enrollment will begin to fall for seven years and drop to 255 students in 2018, and the continuous descent is forecast to be interrupted for a couple of years with a small rise in enrollments, but then they are forecast to resume their fall and drop to 230 students in 2021. In sum, the grades 7-8 enrollment will lose 54 students (-15.1%) over the next five years, and another 74 students (24.5%) over the second five years. In total the upper level middle school enrollment is projected to decline by 128 students or 35.9%, the largest percentage loss among the grade enrollments.

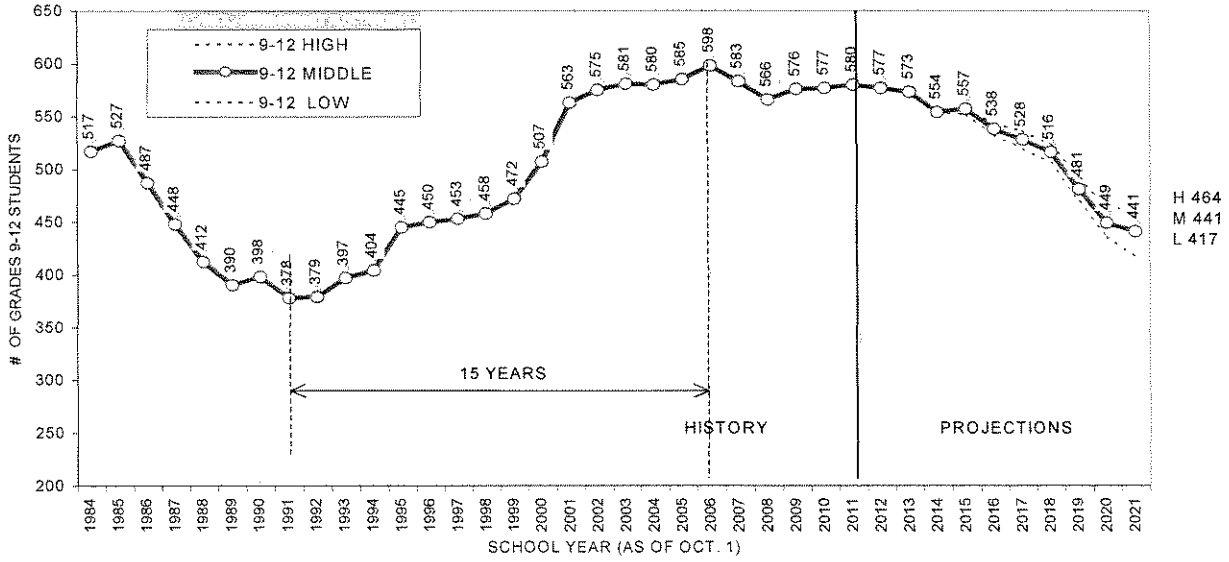
FIG. 5-4
GRADES 7&8 ENROLLMENT PROJECTIONS
REGIONAL SCHOOL DISTRICT 13, CT, 2012-2021



The low enrollment projections are 1% to 2% below the middle projections for the first seven years between 2012 and 2018, but the differences increase to -5% to -7% of the middle projections for the three remaining projection period. In contrast, the high projections are 1 to 2% less than the middle projections in the first seven years, and 5 to 7% larger than the middle projection in the remaining three years. While the high projections are projected to produce a reduction of 113 students (-31.5%), and the middle projections forecast a reduction of 128 students (-35.9%), the low projections could yield as much as a 43% or 153 students reduction in grades 7-8 enrollments over the next ten years. In sum, the grades 7-8 enrollments will experience the largest reduction in ten years. Therefore, the grades 7-8 enrollments are projected to experience the largest reduction in ten years. The 2021 enrollment level for grades 7-8 would then be about the same as it was in 1988, the year when grades 7-8 enrollments in RSD 13 were at their lowest.

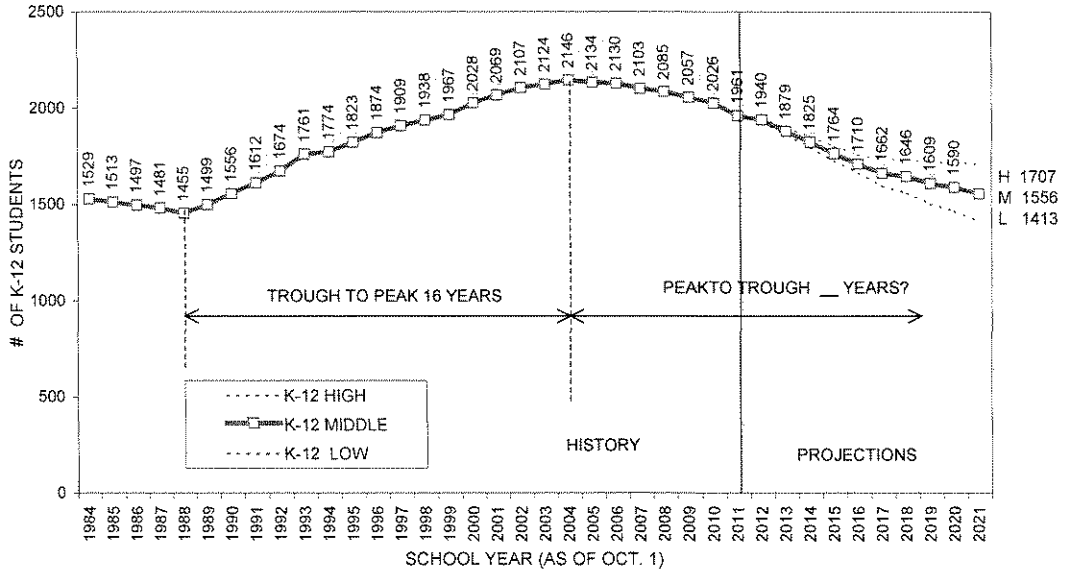
(f) Grades 9-12 Enrollment Projections: High school enrollments increased from 378 students in 1991 to 683 students in 2007; then the enrollment maintained more or less the same level reaching 582 students in 2011, losing only 1 student within five years from their peak enrollment. According to our middle projections, high school enrollments will unequivocally decline over the 10-year projection period, dropping to 548 students in 2016 and 452 students in 2021. n comparison, high school enrollment will decline to 470 students in 2021 according to the high projections, and to 434 students according to the low projections. Note that unlike lower grade levels, the low and high grades 9-12 enrollments are not too different from the middle projections, and only 18 students (4.0%) higher or lower than the middle enrollment projections in 2021.

FIG. 5-5
GRADES 9-12 ENROLLMENT PROJECTIONS
REGIONAL SCHOOL DISTRICT 13, CT, 2012-2021



(g) Grades K-12 Enrollment Projections: As shown in Figure 5-6 below, K-12 enrollment steadily expanded from 1,455 students in 1988 to 2,146 students in 2004 adding 691 students (+47.5%) in 16 years at the average rate of 43 students per year. After reaching its peak enrollment in 2005, according to the middle projections, K-12 enrollment will begin to diminish, decreasing to 1556 students in 2021. In comparison, according to the low projections, K-12 enrollments will decline to 1,413 students, 143 students (-9.2%) less than the middle projections; the high projections indicate K-12 enrollments will decline to 1,707 students in 2021, 165 students (9.7%) more than the middle projections.

FIG. 5-6
GRADES K-12 ENROLLMENT PROJECTIONS
REGIONAL SCHOOL DISTRICT 13, CT, 2012-2021



5.8 Enrollment Projections by the Share Ratio Method

School enrollment projections by grade were derived by applying the Share Ratio Method (SRM). Under the Share Ratio Method, Regional School District 13's future enrollments were calculated by projecting Regional School District 13's share of enrollments as a percent of the statewide enrollments for each grade and then multiplying these percentages by the statewide enrollment projections by grade. It turned out the SRM projections are nearly the same as the CSM projections so that we are not presenting the projection results separately in this report. However, the Share Ratio Method has the advantage of being capable of showing Regional School District 13's enrollment changes relative to statewide enrollment changes.

Regional School District 13's Share of Connecticut's Enrollments: Table 5.6 summarizes Regional School District 13's shares of Connecticut's enrollments by grade level (in percentages). Note that Regional School District 13's K-12 enrollment represented 0.376 percent of the state's total K-12 enrollment in 2010. In comparison, Regional School District 13's total population was 0.331% of the state's total population in 2010 ((7,388 Durham Population + 4,425 Middlefield Population) / 3,574,097 CT Population) according to the 2010 U. S. Census of Population data. Note also that RSD 13 had only 0.206% of statewide total births in 2010, a very low figure. Similarly, the kindergarten ratio of 0.251% in 2011 was also very low.

TABLE 5.6
REGIONAL SCHOOL DISTRICT 13'S ENROLLMENT AS A PERCENT OF
CONNECTICUT'S ENROLLMENT BY GRADE LEVEL, 1999 – 2019

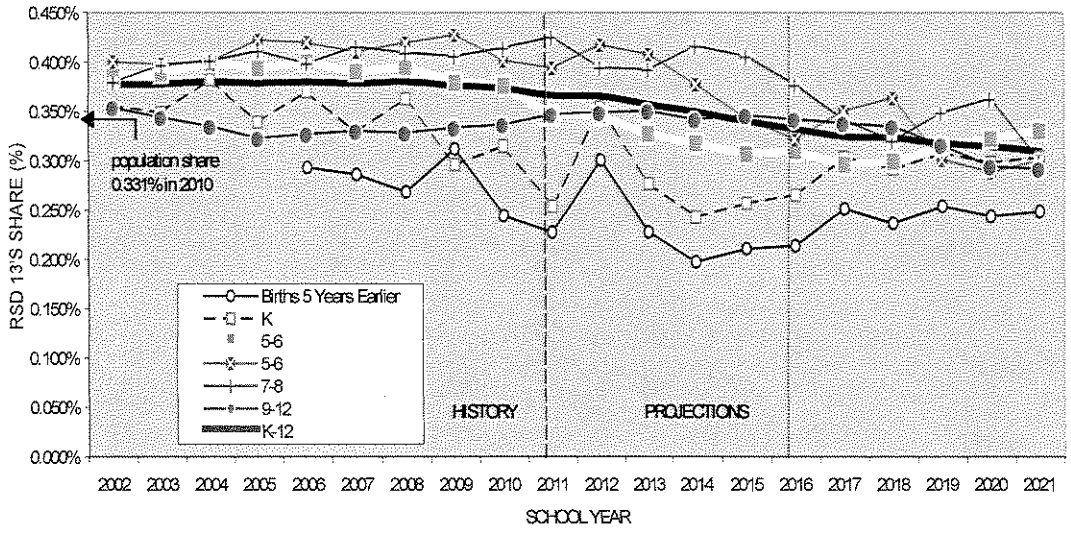
Middle Projections by CSM and SRM

	BIRTHS	K	K-4	5-6	7-8	9-12	K-12
1995	0.240%	0.356%	0.365%	0.392%	0.359%	0.334%	0.363%
1996	0.249%	0.331%	0.355%	0.411%	0.385%	0.328%	0.365%
1997	0.240%	0.347%	0.354%	0.418%	0.400%	0.322%	0.367%
1998	0.249%	0.346%	0.359%	0.390%	0.418%	0.316%	0.365%
1999	0.275%	0.311%	0.368%	0.354%	0.430%	0.316%	0.364%
2000	**0.284%**	**0.368%**	**0.383%**	**0.375%**	**0.384%**	**0.329%**	**0.370%**
2001	0.281%	0.353%	0.390%	0.382%	0.341%	0.351%	0.373%
2002	0.279%	0.355%	0.384%	0.400%	0.380%	0.354%	0.380%
2003	0.263%	0.349%	0.388%	0.397%	0.397%	0.344%	0.383%
2004	0.303%	0.382%	0.399%	0.400%	0.401%	0.335%	0.386%
2005	0.237%	0.356%	0.393%	0.428%	0.393%	0.333%	0.385%
2006	0.223%	0.370%	0.399%	0.420%	0.398%	0.338%	0.389%
2007	0.298%	0.329%	0.390%	0.411%	0.415%	0.330%	0.384%
2008	0.215%	0.363%	0.395%	0.419%	0.409%	0.328%	0.387%
2009	0.188%	0.296%	0.379%	0.427%	0.406%	0.333%	0.381%
2010	**0.206%**	**0.315%**	**0.376%**	**0.403%**	**0.416%**	**0.338%**	**0.376%**
2011	0.208%	0.251%	0.340%	0.394%	0.422%	0.346%	0.363%
PROJECTIONS							
2012	*0.245%*	*0.351%*	*0.343%*	*0.410%*	*0.390%*	*0.347%*	*0.362%*
2013	*0.238%*	*0.276%*	*0.323%*	*0.398%*	*0.390%*	*0.348%*	*0.353%*
2014	*0.257%*	*0.241%*	*0.313%*	*0.374%*	*0.406%*	*0.339%*	*0.345%*
2015	*0.243%*	*0.255%*	*0.303%*	*0.339%*	*0.394%*	*0.343%*	*0.335%*
2016	*0.248%*	*0.263%*	*0.306%*	*0.316%*	*0.370%*	*0.336%*	*0.327%*
2017	*0.259%*	*0.303%*	*0.292%*	*0.345%*	*0.335%*	*0.331%*	*0.319%*
2018	--	*0.290%*	*0.296%*	*0.358%*	*0.314%*	*0.327%*	*0.318%*
2019	--	*0.305%*	*0.309%*	*0.296%*	*0.340%*	*0.308%*	*0.312%*
2020	**--**	***0.297%***	***0.319%***	***0.284%***	***0.354%***	***0.288%***	***0.309%***
2021	--	*0.303%*	*0.327%*	*0.296%*	*0.293%*	*0.285%*	*0.304%*
2000-2010	0.725	0.856	0.982	1.075	1.083	1.027	1.016
2010-2020		0.943	0.848	0.705	0.851	0.852	0.822

Table 5.5 (last row) also shows the changing ratios of Regional School District 13's shares of Connecticut enrollments for the last decade (2000-2010) and the upcoming decade (2010-2010). When Regional School District 13's enrollment growth rate is the same as that of Connecticut, Regional School District 13's 2020/2010 share ratios are expected to be one (1.00). Observe from Table 5.6 that the 2020/2010 share ratios for all grade levels were less than one indicating that

Regional School District 13 school enrollments are projected to decline faster than the state as a whole. Note also that the 2010/2000 ratio for RSD13's births in 2010 is small (0.725) indicating a much faster decline than Connecticut's projected births. Accordingly the RSD/CT ratios for all grade levels are projected to be less than one. Therefore, we may conclude that Regional School District 13's enrollment decline, which was faster than the statewide enrollment decline, is mainly due to the fact that Regional School District 13's births declined much faster than the birth trend of Connecticut during the past four years due to dire economic conditions. Figure 5-7 below exhibits the declining trends of RSD 13's share of Connecticut's births and enrollments between 2002 and 2021.

FIG. 5-7
REGIONAL SCHOOL DISTRICT 13'S SHARE OF
CONNECTICUT'S ENROLLMENTS, 2002-2021



5.9 Application of Enrollment Projections for School Facilities Planning

We have prepared various enrollment projections combining different methods and various assumptions. However, we have so far narrowed down the projections for low, middle and high projections applying the Cohort-Survival method with different assumptions on projected births and inter-grade survival ratios. We found the share-ratio and multiple regression methods provided enrollment projections quite similar to the CSM projections. But given these three (low, middle and high) projections, which one should the school authority use for school facilities planning purposes?

We prefer the Middle Projections for the following reasons.

(a) Accuracy of Projections: The most important criterion of choice is the accuracy of projections. Everyone may ask which projection is most accurate or most probable. However, it is impossible to know the accuracy of projections ahead of time. The projections are not predictions. When all three alternative scenarios are equally plausible,* we offer a strategy for choosing the enrollment projection which has the better chance of yielding the least errors and thus avoiding a 'big mistake'. However if one thinks one of the three assumption scenarios is more plausible than the other two, the projections associated with the preferred assumptions must be chosen.

(1) The Middle Projections will produce the least errors (approximately ± 2% ~ 10%) even if either the low (w. 3-year trend) or high (10-year trend) projections turn out to be true. In comparison, if we choose the low projections but actual K-12 enrollments turn out to equal the high projections, then the projection error would be 4% ~ 20%. *

(2) The 3-year trend (low) projections may be more plausible for the short-term future but not for the long-term future, and the 10-year trend (high) projections may be more appropriate for the distant future but not for the near future.

(3) Our experiences show that the enrollment projections prepared at the time that enrollments are rapidly declining very often prove to be too low in hindsight because the projections are basically linear (straight-line) projections: they are therefore likely to miss the inflection (turning) points, that is, future enrollment peaks and valleys (this is called a 'recency' bias).

(4) The projections prepared by the three methods (CSM, SRM and MRM) are almost the same. Accordingly, we can quote the statistics produced by the MRM projections and use them for the projections prepared by CSM and SRM. According to Equation 3.5 in Section 3 of this report, on average the margin of error for K-12 enrollment projections made by this equation is within ±7.7% at the 95% confidence level, indicating that variations of the low and high projections are within the ± 2 Standard Errors of the projected enrollments.

(5) In addition, the SRM projections show that the Middle Projection's shares of Connecticut's future enrollments appear to closely follow the patterns established during the past decade as shown in Table 5.6.

*Although we offered three (low, middle and high) enrollment projections, if we look at Table 5.5, we notice the three enrollment projections for the first five-years (2012-2016) are not too different from each other: for all grade levels, the differences range by ±1 to 3% from the middle projections. Thus, for practical purposes, these low, middle and high projections are nearly the same. On the other hand, the three projections for the second five-year period (2017-2021) vary from the middle projections by about 7% to 10%. If the low projections are chosen but the high projections turn out to be true, then the maximum errors could be as much as 14% to 20%. Even so, school districts rarely conduct 10-year enrollment projections and sit out all ten years without updating the projections. When reality reveals one of the three assumptions to be more plausible, they can update the projections or modify the earlier projections.

It is important to emphasize that the future outcome will be greatly dependent on the future economic conditions of the nation and of Connecticut as well as for Regional School District 13's status relative to the statewide economic conditions.* Therefore we have to closely monitor changing economic realities and re-examine the projection assumptions stated in Section 4. We tend to discount the lowest projections on the grounds that the last three years contained an unprecedented economic recession, the greatest upheaval since the Great Depression of the 1930s. On the other hand, we may also discount the highest projections due to economic uncertainty and malaise in the national and regional economies. Thus, the middle projections may be more likely to produce the least projection errors in the long run.

(b) Risk Taking: The choice of which projection to use for the purpose of school facilities planning is dependent not only on the perceived accuracy of the projections, but also on the school authority's attitude toward risk-taking. If one assumes that the low and high projections presented in this report are equally plausible, one may choose the low projections if the school system prefers to err on the side of "under-planning". If the school system "under-plans", the short-term costs will be lower and there remains the option of adding more facilities when needed. However, under-planning or an incremental approach risks that educational quality may suffer due to temporary overcrowding and that overall school construction costs may escalate. This escalation will be due to the rising price of construction over the years and the increase in cost and time when expansion is negotiated as a series of jobs rather than as a single construction job.

On the other hand, the school system may choose the "high" projections if it prefers the risk of "over-planning" or building more facilities than needed. Over-planning will build more facilities than required in the short-run, but this strategy foresees that in *a growing community*, schools can always grow into the excess capacity and escalating higher standards of educational space utilization. Though the short-term costs will be higher, educational quality will not be compromised and long-term overall costs may be lower.

(c) Surprises due to Random Factors: Enrollment projections presented in this report may be called 'surprise-free' projections, meaning that we were not able to take into consideration any random factors; by definition we cannot possibly foresee the nature, extent and timing of events such as unexpected economic/social disasters, wars, natural calamities, and endemic diseases. Thus, it is always possible that the future reality may turn out to be unexpectedly and *significantly* different from the projections presented in this report. Accordingly, the Regional School District 13 Public Schools should be ready to update their long-term enrollment projections if future economic conditions substantially differ from the assumptions adopted in this report.

* If one of the three scenarios is considered most probable, we should choose the most probable scenario. On the other hand, if one of the scenarios is most improbable, it should be dropped from further consideration. It must be noted that the very reason we offered three alternatives is that we were uncertain as to the future course of our economy.

(d) Uncertainty of Enrollment Projections and Flexibility in School Facilities Planning: As stated earlier, enrollment projections are not predictions, and they are susceptible to errors. Accordingly, school facilities must be planned with considerable flexibility in design. Flexibility means the ability to build additions, to convert existing spaces for different uses, to change the size of rooms from small to large spaces or vice versa, and the ability to keep up with changing technology and pedagogical requirements. An obvious fact should be noted: small facilities lose flexibility to meet unexpected situations.

For these reasons we recommend the adoption of the middle projections for school facilities planning purposes. *However, it is up to the school authority to determine which projections are most consistent with their risk-taking philosophy and the assessment of projection assumptions.*

5.10 Hybrid Enrollment Projections

It is possible that the school authority may use all three (low, middle and high) projections depending on the time horizons for which the enrollment projections are needed. For example, the weighted 3-year trend projections (the most recent past) may be used for the next two years, and the 5-year or weighted 5-year trend projections may be suitable for the mid-term period (3rd to 5th year), and the 10-year trend projections may be appropriate for the long-tem period (6th to 10th year) depending on the most current data on births, new home construction, home sales and unemployment data are available.

5.11 Enrollment Growth Over the Next Twenty Years

What will be the trend in enrollment growth *beyond* the ten-year projections included in this study? For example, when a new school is built, it is going to last for decades and this is a very pertinent question for the school facilities policy makers. They have to manage the excess or shortage of school facilities to maintain desirable educational standards at the same time achieving financial efficiency. For these reasons, it is quite desirable to have a very long-term glimpse (if not a projection) of future enrollment levels.

Although we wish to have 20-year enrollment projections, in order to accomplish this goal we have to project future births for fifteen years from 2010 to 2024. Clearly this is an ambitious and risky task. However, there are some clues about the future that would help provide at least a rudimentary answer. It is reasonable to believe that the births cycle of Regional School District 13 is *at least* 32 years from the first birth trough (99 births) in 1977 to the second birth trough (79 births) in 2009. There were 99 births recorded in 1977 and 79 births in 2009, and as long as the number of births does not decline further below 79? births after 2009, then the 34-year birth cycle is a fact. Therefore, the enrollment cycles of K-4, 5-8, and 9-12 will follow the birth cycle with several successive time lags and each of these cycles will also show more or less 32 years cycles. Such enrollment cycles are shown in Table 5-7. According to this table, the K-4 enrollments' second trough will occur in 2017 with projected enrollment of 574 students. And, if we assume 34-

year full enrollment cycle for grades 5-8 and 33 or 34 years for grades 9-12, their second enrollment troughs may occur in 2021 and 2024 (or 2025), respectively.

TABLE 5.7
HISTORICAL AND PROJECTED BIRTH AND ENROLLMENT CYCLES
RSD 13 PUBLIC SCHOOLS, 1975 - 2030

	Actual Births and Enrollments				Tentative Projections.....		
	Year of the 1st Trough	1st Trough Enrollments Or Births	Peak Year	Peak Enrollment Or Births	Year of the 2nd Trough	2nd Trough Enrollment Or Births	Length of T-to-T Full Cycle
Births	1978	84	1992	137	2009	79	31 Years
K-4	1984	519	2001	853	*2017*	*574*	33 Years
5-8	1987	446	2005	733	*2021***	*?*	34 Years?
9-12	1991	378	2006	583	*2004***	*?*	33 Years?

5.12 Annual Updating of School Enrollment Projections

The cyclical variations in enrollment can be easily captured by the annual updating of school enrollment projections. The annual updating will confirm the validity of assumptions adopted in this report, and should be able to fine-tune the projections, based on the additional data available each year.

5.13 Summary and Conclusions

1) The number of annual births is the primary factor that determines the future school-age population and school enrollments. Two other important factors are the net migration of school children and the number of children attending nonpublic schools; these factors are reflected in the inter-grade survival or retention rates.

2) We need ten-year *births* data in order to make 10-year enrollment projections. The first five years (2005-2009) are already known, but the next five years (2010-2014) must be projected or estimated. We assumed three levels of births: low (declining), middle (flat), and high (increasing) births.

3) Based on the three alternative births scenarios, we prepared various enrollment projections applying three methods (CSM, SRM and MRM) and projecting different pasts such as 3-, 5-, 10-, weighted 3-, and weighted 5-year past trends. We found the projections prepared by CSM, SRM and MRM to be more or less the same and chose to present the Cohort Survival Method projections in the report.

4) Given the various projections made, we chose three alternative projections: 3-year trend projections based on the low births for the Low Projections; 10-year trend projections based on the high births scenario for the High Projections; and an average of the low and high projections based on the application of a middle births scenario for the Middle Projections. Thus, the low projections assume a pessimistic economic outlook or slow economic recovery; the high projections assume an optimistic economic outlook or fast economic recovery; and the middle projections assume an economic recovery at a moderate pace.

5) Of the three alternative projections, the low projection is preferred on the ground that it is likely to produce the least projection errors when all three scenarios are considered to be equally plausible. At the same time, faced with considerable uncertainty, the middle projection is a cost-efficient strategy that avoids costly over-planning or under-planning approaches to long-term school facility development.

6) Enrollment projections presented in this report are long-term *trend-line* (surprise free) projections that ignore the potentially severe fluctuations resulting from random events. Thus, ..actual enrollments may be significantly above or below the trend-line projections.

7) The school authority may choose one of the low, middle, and high projections presented in this report in accordance with its own risk-taking philosophy to maximize the educational goals in the most cost-effective manner. However, the Middle Projections (average of low and high projections) are preferred on the grounds that in the long run they will minimize the margin of possible projection errors.

8) The updating of enrollment projections is strongly recommended when the school authority detects the violation of the enrollment projection assumption's validity. Remember too that the small cost of updating the enrollment projections saves a large sum in tax resources: waste can occur when expensive school facilities are effectuated without comprehensive demographic studies.

SECTION 5 APPENDIX TABLES

DISTRICT-WIDE ENROLLMENT PROJECTIONS BY GRADE

(LOW, MIDDLE AND HIGH PROJECTIONS)

APPENDIX TABLE 5-A
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOL ENROLLMENT HISTORY AND PROJECTIONS BY GRADE
1984-2021

(Middle Projections)

YEAR	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	K-4	5-6	7-8	9-12	K-12	PK-12	5-8
HISTORY:																					
1984	0	**100**	117	**83**	112	107	111	109	117	155	143	141	130	103	519	220	272	517	1528	1528	492
1985	0	107	**115**	106	**89**	112	112	110	111	120	124	135	133	136	529	222	231	528	1510	1510	453
1986	15	102	123	111	105	**92**	116	117	124	106	98	120	136	133	533	233	230	487	1483	1498	463
1987	12	110	133	108	111	113	**90**	120	117	119	102	98	113	136	575	210	236	449	1470	1482	446
1988	13	114	119	122	109	115	114	**94**	120	125	108	104	89	112	579	208	245	413	1445	1458	453
1989	9	141	134	123	123	114	127	120	**96**	119	101	106	96	86	635	247	215	389	1486	1495	462
1990	12	126	166	128	125	129	120	133	122	**98**	103	101	98	95	674	253	220	397	1544	1556	473
1991	12	138	147	159	130	131	135	125	134	124	**85**	103	93	97	705	260	258	378	1601	1613	518
1992	11	143	161	141	161	136	137	141	126	136	107	**84**	95	92	742	278	262	378	1660	1671	540
1993	11	159	168	154	143	168	143	143	143	128	118	107	**78**	94	792	286	271	397	1746	1757	557
1994	12	146	159	161	157	149	161	149	145	132	111	117	99	**77**	772	310	277	404	1763	1775	587
1995	13	157	139	156	163	171	156	154	142	127	121	108	110	106	786	310	269	445	1810	1823	579
1996	22	143	167	145	155	164	176	156	158	138	121	120	103	106	774	332	296	450	1852	1874	628
1997	23	147	154	171	145	157	166	177	155	161	125	119	108	101	774	343	316	453	1886	1909	659
1998	18	147	174	159	170	142	158	172	180	160	135	112	108	103	792	330	340	458	1920	1938	670
1999	18	131	165	184	163	167	149	160	175	183	133	124	104	111	810	309	358	472	1949	1967	667
2000	19	153	159	165	**188**	171	177	159	154	176	156	129	119	103	836	336	330	507	2009	2028	666
2001	18	148	177	166	170	**192**	171	177	153	151	155	159	126	123	853	348	304	563	2068	2086	652
2002	13	148	164	183	163	172	193	166	188	155	147	146	153	129	830	359	343	575	2107	2120	702
2003	29	146	168	162	183	170	169	185	170	190	143	140	145	153	829	354	360	581	2124	2153	714
2004	35	160	156	179	164	192	177	176	189	173	162	134	135	149	851	353	362	580	2146	2181	715
2005	36	141	183	162	178	170	192	173	177	191	145	162	127	133	834	365	368	567	2134	2170	733
2006	34	151	152	187	169	181	173	187	176	176	164	133	160	121	840	360	352	578	2130	2164	712
2007	36	131	168	152	186	174	183	166	182	178	145	158	133	147	811	349	360	583	2103	2139	709
2008	38	149	153	173	154	187	174	179	166	184	143	144	157	122	816	353	350	566	2085	2123	703
2009	25	118	168	158	178	153	187	173	180	166	150	138	141	147	775	360	346	576	2057	2082	706
2010	26	125	131	162	161	183	149	185	172	178	141	154	143	136	762	334	350	574	2020	2046	684
2011	14	101	134	130	171	160	182	143	184	174	150	136	155	141	696	325	358	582	1961	1975	683
MIDDLE PROJECTIONS:																					
2012	*29*	140	113	135	133	173	159	179	144	185	147	147	135	151	694	338	328	580	1940	1969	666
2013	*29*	106	156	113	138	135	173	157	180	144	156	144	146	131	649	330	324	577	1879	1908	653
2014	*29*	93	118	157	116	140	134	170	157	180	122	153	143	141	624	304	337	559	1825	1853	641
2015	*29*	100	104	119	161	118	140	132	171	158	152	119	152	139	601	272	328	562	1764	1792	601
2016	*29*	103	111	105	122	163	118	137	133	171	133	149	119	147	603	255	304	548	1710	1739	559
2017	*29*	117	114	112	107	124	162	115	138	133	145	130	148	115	574	278	271	539	1662	1690	549
2018	*29*	113	130	115	114	109	124	160	116	139	112	141	130	144	581	283	255	527	1646	1674	538
2019	*29*	119	125	131	118	116	109	121	160	116	117	110	141	126	608	230	277	494	1609	1638	507
2020	*29*	115	132	126	134	119	115	106	122	161	98	114	109	137	626	222	283	459	1590	1619	505
2021	*29*	117	128	133	129	136	119	113	107	123	136	96	114	106	643	233	230	452	1556	1584	463

Source: H. C. Planning Consultants, Inc. Estimate and projections are shown in italics.

APPENDIX TABLE 5-A (Continued)

--Figures in the shaded areas are enrollment projections based on actual number of births--

PANEL A: LOW PROJECTIONS (Low Births and W. 3-Year Trend Projections)

YEAR	K	1	2	3	4	5	6	7	8	9	10	11	12	K-4	5-6	7-8	9-12	K-12
2011	101	134	130	171	160	182	143	184	174	150	136	155	141	696	325	358	582	1961
2012	134	112	134	135	172	158	179	143	184	145	148	136	150	687	337	327	580	1930
2013	101	148	112	138	136	171	156	179	143	153	143	149	131	635	326	322	577	1860
2014	88	113	147	116	139	133	168	155	179	119	152	144	144	604	301	334	558	1797
2015	95	99	112	153	117	138	132	167	155	149	117	152	139	576	270	323	558	1726
2016	97	105	99	116	154	116	135	132	167	129	147	118	147	571	252	299	541	1663
2017	101	107	105	102	117	152	114	135	132	140	128	148	115	532	266	267	530	1595
2018	96	112	107	109	103	116	150	114	135	110	138	128	143	526	266	249	518	1559
2019	102	106	111	111	109	102	114	149	114	113	109	138	124	540	216	263	484	1503
2020	99	113	106	115	111	108	100	114	149	95	111	109	134	545	208	263	449	1465
2021	101	109	113	110	116	110	106	100	114	125	93	112	105	548	217	214	434	1413
2011-21	0	-25	-17	-61	-44	-72	-37	-84	-60	-25	-43	-43	-36	-148	-108	-144	-148	-548
Change	0%	-18%	-13%	-36%	-28%	-39%	-26%	-46%	-35%	-17%	-31%	-28%	-26%	-21%	-33%	-40%	-25%	-28%

PANEL B: MIDDLE PROJECTIONS (Middle Births and AVG. OF 10- AND W. 3-Year Trend Projections)

YEAR	K	1	2	3	4	5	6	7	8	9	10	11	12	K-4	5-6	7-8	9-12	K-12
2011	101	134	130	171	160	182	143	184	174	150	136	155	141	696	325	358	582	1961
2012	140	113	135	133	173	159	179	144	185	147	147	135	151	694	338	328	580	1940
2013	106	156	113	138	135	173	157	180	144	156	144	146	131	649	330	324	577	1879
2014	93	118	157	116	140	134	170	157	180	122	153	143	141	624	304	337	559	1825
2015	100	104	119	161	118	140	132	171	158	152	119	152	139	601	272	328	562	1764
2016	103	111	105	122	163	118	137	133	171	133	149	119	147	603	255	304	548	1710
2017	117	114	112	107	124	162	115	138	133	145	130	148	115	574	278	271	539	1662
2018	113	130	115	114	109	124	160	116	139	112	141	130	144	581	283	255	527	1646
2019	119	125	131	118	116	109	121	160	116	117	110	141	126	608	230	277	494	1609
2020	115	132	126	134	119	115	106	122	161	98	114	109	137	626	222	283	459	1590
2021	117	128	133	129	136	119	113	107	123	136	96	114	106	643	233	230	452	1556
2011-21	16	-6	3	-42	-24	-63	-30	-77	-51	-14	-40	-41	-35	-53	-92	-128	-130	-405
Change	16%	-5%	2%	-25%	-15%	-35%	-21%	-42%	-30%	-9%	-29%	-27%	-25%	-8%	-28%	-36%	-22%	-21%

PANEL C: HIGH PROJECTIONS (High Births and 10-Year Trend Projections)

YEAR	K	1	2	3	4	5	6	7	8	9	10	11	12	K-4	5-6	7-8	9-12	K-12
2011	101	134	130	171	160	182	143	184	174	150	136	155	141	696	325	358	582	1961
2012	146	113	136	132	175	160	179	145	185	149	145	134	151	702	339	330	579	1950
2013	111	163	115	138	135	175	158	180	146	158	144	143	130	662	333	326	575	1896
2014	97	124	166	117	141	135	172	159	182	125	154	142	139	645	307	341	560	1853
2015	104	108	126	168	119	142	133	174	160	156	121	152	139	625	275	334	568	1802
2016	109	116	111	128	172	120	139	134	175	137	151	119	147	636	259	309	554	1758
2017	135	121	118	112	131	173	117	141	135	150	133	149	116	617	290	276	548	1731
2018	130	149	123	120	115	131	169	118	142	115	145	131	145	637	300	260	536	1733
2019	137	144	152	125	123	115	129	171	119	121	112	143	127	681	244	290	503	1718
2020	133	152	147	154	128	123	113	130	172	102	117	110	139	714	236	302	468	1720
2021	135	148	154	149	157	128	121	114	131	148	99	116	107	743	249	245	470	1707
2011-21	34	14	24	-22	-3	-54	-22	-70	-43	-2	-37	-39	-34	47	-76	-113	-112	-254
Change	34%	10%	18%	-13%	-2%	-30%	-15%	-38%	-25%	-1%	-27%	-25%	-24%	7%	-23%	-32%	-19%	-13%

Source: Prepared by HC Planning Consultants, Inc. 05/11/2012

APPENDIX TABLE 5-B
REGIONAL SCHOOL DISTRICT 13 SHARE (%) OF CONNECTICUT'S ENROLLMENTS BY GRADE LEVEL, 2011-2021

A. Low Projections

SCHOOL YEAR	K-4	5-6	7-8	9-12	K-12	K-4	5-6	7-8	9-12	K-12
	Regional School District 13 Public School Enrollments					Regional School District 13 Share (%) of Connecticut's Grade Enrollments				
2011	696	325	358	582	1961	0.35%	0.39%	0.43%	0.35%	0.37%
2012	687	337	327	580	1930	0.34%	0.42%	0.39%	0.35%	0.36%
2013	635	326	322	577	1860	0.32%	0.40%	0.39%	0.35%	0.35%
2014	604	301	334	558	1797	0.31%	0.37%	0.41%	0.34%	0.34%
2015	576	270	323	558	1726	0.29%	0.34%	0.40%	0.34%	0.33%
2016	571	252	299	541	1663	0.29%	0.32%	0.37%	0.34%	0.32%
2017	532	266	267	530	1595	0.27%	0.34%	0.34%	0.33%	0.31%
2018	526	266	249	518	1559	0.27%	0.34%	0.31%	0.33%	0.31%
2019	540	216	263	484	1503	0.28%	0.28%	0.33%	0.31%	0.30%
2020	545	208	263	449	1465	0.28%	0.27%	0.34%	0.29%	0.29%
2021	548	217	214	434	1413	0.28%	0.28%	0.28%	0.28%	0.28%

B. Middle Projections

SCHOOL YEAR	K-4	5-6	7-8	9-12	K-12	K-4	5-6	7-8	9-12	K-12
	Regional School District 13 Public School Enrollments					Regional School District 13 Share (%) of Connecticut's Grade Enrollments				
2011	696	325	358	582	1961	0.35%	0.39%	0.43%	0.35%	0.37%
2012	694	338	328	580	1940	0.35%	0.42%	0.39%	0.35%	0.37%
2013	649	330	324	577	1879	0.33%	0.41%	0.39%	0.35%	0.36%
2014	624	304	337	559	1825	0.32%	0.38%	0.42%	0.34%	0.35%
2015	601	272	328	562	1764	0.31%	0.34%	0.41%	0.35%	0.34%
2016	603	255	304	548	1710	0.31%	0.32%	0.38%	0.34%	0.33%
2017	574	278	271	539	1662	0.30%	0.35%	0.34%	0.34%	0.32%
2018	581	283	255	527	1646	0.30%	0.36%	0.32%	0.33%	0.32%
2019	608	230	277	494	1609	0.31%	0.30%	0.35%	0.32%	0.32%
2020	626	222	283	459	1590	0.32%	0.29%	0.36%	0.29%	0.31%
2021	643	233	230	452	1556	0.33%	0.30%	0.30%	0.29%	0.31%

C. High Projections

SCHOOL YEAR	K-4	5-6	7-8	9-12	K-12	K-4	5-6	7-8	9-12	K-12
	Regional School District 13 Public School Enrollments					Regional School District 13 Share (%) of Connecticut's Grade Enrollments				
2011	696	325	358	582	1961	0.35%	0.39%	0.43%	0.35%	0.37%
2012	702	339	330	579	1950	0.35%	0.42%	0.40%	0.35%	0.37%
2013	662	333	326	575	1896	0.33%	0.41%	0.40%	0.35%	0.36%
2014	645	307	341	560	1853	0.33%	0.38%	0.42%	0.34%	0.35%
2015	625	275	334	568	1802	0.32%	0.35%	0.41%	0.35%	0.35%
2016	636	259	309	554	1758	0.33%	0.33%	0.38%	0.35%	0.34%
2017	617	290	276	548	1731	0.32%	0.37%	0.35%	0.34%	0.34%
2018	637	300	260	536	1733	0.33%	0.39%	0.33%	0.34%	0.34%
2019	681	244	290	503	1718	0.35%	0.32%	0.37%	0.32%	0.34%
2020	714	236	302	468	1720	0.37%	0.31%	0.39%	0.30%	0.34%
2021	743	249	245	470	1707	0.38%	0.32%	0.32%	0.30%	0.34%

Source: Prepared by HC Planning Consultants, Inc. 05/11/2012

APPENDIX TABLE 5-C
PUBLIC SCHOOL ENROLLMENT PER HOUSING UNIT
REGIONAL SCHOOL DISTRICT 13, CONNECTICUT, 1997-2021

(The highest enrollment multipliers are framed and the lowest multipliers are underlined.)

	Total HU	K-4	5-6	7-8	9-12	K-12	K-4	5-6	7-8	9-12	K-12
		HISTORY									
1997	3895	774	343	316	453	1886	0.199	0.088	0.081	0.116	0.484
1998	3949	792	330	340	458	1920	0.201	0.084	0.086	0.116	0.486
1999	4031	810	309	358	472	1949	0.201	0.077	0.089	0.117	0.484
2000	4106	836	336	330	507	2009	0.204	0.082	0.080	0.123	0.489
2001	4142	853	348	304	563	2068	**0.206**	0.084	0.073	0.136	0.499
2002	4209	830	359	343	575	2107	0.197	0.085	0.081	0.137	0.501
2003	4269	829	354	360	581	2124	0.194	0.083	0.084	0.136	0.498
2004	4324	851	353	362	580	2146	0.197	0.082	0.084	0.134	0.496
2005	4376	834	365	368	567	2134	0.191	0.083	0.084	0.130	0.488
2006	4418	840	360	352	578	2130	0.190	0.081	0.080	0.131	0.482
2007	4455	811	349	360	583	2103	0.182	0.078	0.081	0.131	0.472
2008	4459	816	353	350	566	2085	0.183	0.079	0.078	0.127	0.468
2009	4459	775	360	346	576	2057	0.174	0.081	0.078	0.129	0.461
2010	4470	762	334	350	574	2020	0.170	0.075	0.078	0.128	0.452
2011	4514	696	325	358	582	1961	0.154	0.072	0.079	0.129	0.434
		LOW PROJECTIONS									
2012	*4520*	687	337	327	580	1930	0.152	0.073	0.072	0.128	0.422
2013	*4526*	635	326	322	577	1860	0.137	0.070	0.071	0.127	0.405
2014	*4532*	604	301	334	558	1797	0.129	0.065	0.072	0.122	0.389
2015	*4538*	576	270	323	558	1726	0.122	0.058	0.069	0.122	0.371
2016	*4544*	571	252	299	541	1663	0.120	0.054	0.064	0.117	0.356
2017	*4550*	532	266	267	530	1595	0.112	0.056	0.057	0.114	0.339
2018	*4556*	526	266	249	518	1559	0.110	0.055	0.053	0.111	0.33
2019	*4562*	540	216	263	484	1503	0.113	0.045	0.055	0.103	0.316
2020	*4568*	545	208	263	449	1465	0.114	0.043	0.054	0.095	0.307
2021	*4574*	548	217	214	434	1413	0.113	0.045	0.044	0.091	0.294
		MIDDLE PROJECTIONS									
2012	4526	694	338	328	580	1940	0.153	0.075	0.073	0.128	0.429
2013	4538	649	330	324	577	1879	0.143	0.073	0.071	0.127	0.414
2014	4550	624	304	337	559	1825	0.137	0.067	0.074	0.123	0.401
2015	4562	601	272	328	562	1764	0.132	0.060	0.072	0.123	0.387
2016	4574	603	255	304	548	1710	0.132	0.056	0.066	0.120	0.374
2017	4586	574	278	271	539	1662	0.125	0.061	0.059	0.117	0.362
2018	4598	581	283	255	527	1646	0.126	0.062	0.055	0.115	0.358
2019	4610	608	230	277	494	1609	0.132	0.050	0.060	0.107	0.349
2020	4622	626	222	283	459	1590	0.136	0.048	0.061	0.099	0.344
2021	4634	643	233	230	452	1556	0.139	0.050	0.050	0.098	0.336
		HIGH PROJECTIONS									
2012	*4,548*	702	339	330	579	1950	0.154	0.075	0.073	0.127	0.429
2013	*4,582*	662	333	326	575	1896	0.144	0.073	0.071	0.125	0.414
2014	*4,616*	645	307	341	560	1853	0.140	0.067	0.074	0.121	0.401
2015	*4,650*	625	275	334	568	1802	0.134	0.059	0.072	0.122	0.388
2016	*4,684*	636	259	309	554	1758	0.136	0.055	0.066	0.118	0.375
2017	*4,718*	617	290	276	548	1731	0.131	0.061	0.058	0.116	0.367
2018	*4,752*	637	300	260	536	1733	0.134	0.063	0.055	0.113	0.365
2019	*4,786*	681	244	290	503	1718	0.142	0.051	0.061	0.105	0.359
2020	*4,820*	714	236	302	468	1720	0.148	0.049	0.063	0.097	0.357
2021	*4,854*	743	249	245	470	1707	0.153	0.051	0.050	0.097	0.352

APPENDIX TABLE 5-D
INTER-GRADE ENROLLMENT CHANGES* BY GRADE AND GRADE LEVEL
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOLS

*Enrollment changes when students in a grade advance to the next grade.

SCHOOL YEAR	K	1	2	3	4	5	6	7	8	9	10	11	12	K-4	5-6	7-8	9-12	K-12
2002	33	16	6	-3	2	1	-5	11	2	-4	-9	-6	3	54	-4	13	-16	47
2003	24	20	-2	0	7	-3	-8	4	2	-12	-7	-1	0	49	-11	6	-20	24
2004	29	10	11	2	9	7	7	4	3	-28	-9	-5	4	61	14	7	-38	44
2005	10	23	6	-1	6	0	-4	1	2	-28	0	-7	-2	44	-4	3	-37	6
2006	22	11	4	7	3	3	-5	3	-1	-27	-12	-2	-6	47	-2	2	-47	0
2007	7	17	0	-1	5	2	-7	-5	2	-31	-6	0	-13	28	-5	-3	-50	-30
2008	27	22	5	2	1	0	-4	0	2	-35	-1	-1	-11	57	-4	2	-48	7
2009	-15	19	5	5	-1	0	-1	1	0	-34	-5	-3	-10	13	-1	1	-52	-39
2010	19	13	-6	3	5	-4	-1	0	-1	-25	5	5	-3	34	-5	-1	-18	10
2011	-1	9	-1	9	-1	-1	-6	-2	1	-29	-5	0	-2	15	-7	-1	-36	-29
3-Yr. Avg.	1	14	-1	6	1	-2	-3	0	0	-29	-2	1	-5	21	-4	0	-35	-19
5-Yr. Avg.	7	16	1	4	2	-1	-4	-1	1	-31	-2	0	-8	29	-4	0	-41	-16
9-Yr. Avg.	16	16	3	2	4	1	-3	2	1	-25	-5	-2	-4	40	-3	3	-36	4
W 3-Yr. Avg.	3	12	-2	6	1	-2	-4	-1	0	-29	-2	1	-4	21	-5	-1	-33	-18
W 5-Yr. Avg.	6	14	0	5	1	-1	-3	-1	0	-30	-2	1	-6	26	-5	0	-37	-16
MINIMUM	-15	9	-6	-3	-1	-4	-8	-5	-1	-35	-12	-7	-13	13	-11	-3	-52	-39
MAXIMUM	33	23	11	9	9	7	7	11	3	-4	5	5	4	61	14	13	-16	47
RANGE	48	14	17	12	10	11	15	16	4	31	17	12	17	48	25	16	36	85
MIDDLE	9	16	3	3	4	2	-1	3	1	-20	-4	-1	-5	37	2	5	-34	4
MEDIAN	20	16	5	2	4	0	-5	1	2	-28	-6	-2	-3	45	-4	2	-38	7

LOW PROJECTIONS: (3--Year Trend)

SCHOOL YEAR	K	1	2	3	4	5	6	7	8	9	10	11	12	K-4	5-6	7-8	9-12	K-12
2012	8	11	0	5	1	-2	-3	0	0	-29	-2	0	-5	25	-5	0	-35	-15
2013	6	14	0	5	1	-1	-2	0	0	-31	-2	0	-5	26	-4	0	-37	-15
2014	5	11	-1	4	1	-2	-3	0	0	-24	-2	1	-5	21	-6	0	-30	-15
2015	6	10	0	5	1	-1	-1	0	0	-30	-2	0	-5	22	-3	0	-36	-17
2016	6	10	0	4	1	-1	-2	0	0	-26	-2	1	-5	21	-3	0	-32	-15
2017	6	10	-1	3	1	-2	-2	0	0	-28	-2	1	-4	21	-4	0	-32	-16
2018	6	10	0	4	1	-1	-3	0	0	-22	-2	0	-5	21	-3	0	-28	-11
2019	6	10	-1	4	1	0	-2	0	0	-23	-1	1	-4	20	-2	0	-27	-9
2020	6	11	-1	4	1	-1	-2	0	0	-19	-1	0	-4	21	-4	0	-25	-8
2021	6	10	-1	4	1	-1	-2	0	0	-25	-1	1	-4	21	-3	0	-30	-12

MIDDLE PROJECTIONS: (Average of 3-Year and 10-Year Trends)

SCHOOL YEAR	K	1	2	3	4	5	6	7	8	9	10	11	12	K-4	5-6	7-8	9-12	K-12
2012	17	12	1	3	2	-1	-3	1	1	-27	-3	-1	-4	35	-2	0	-35	-3
2013	13	16	1	3	2	0	-3	1	1	-29	-3	-1	-4	34	-1	0	-37	-4
2014	11	12	1	3	2	-1	-3	1	1	-22	-3	-1	-5	28	-2	0	-31	-5
2015	12	11	1	4	2	0	-2	1	1	-28	-3	-1	-4	29	-1	0	-36	-7
2016	12	11	1	3	2	0	-3	1	1	-25	-3	0	-5	29	-1	0	-33	-5
2017	14	11	1	3	2	-1	-2	1	0	-26	-3	-1	-3	30	-1	0	-33	-4
2018	14	13	1	3	2	0	-3	1	1	-21	-3	-1	-4	31	-2	0	-29	0
2019	15	12	1	3	2	0	-2	1	0	-21	-2	-1	-4	32	-1	0	-28	3
2020	14	13	1	3	2	-1	-2	1	1	-18	-3	-1	-4	32	-1	0	-25	6
2021	14	12	1	3	2	0	-2	1	0	-25	-2	-1	-4	32	-1	0	-31	0

HIGH PROJECTIONS: (10--Year Trend)

SCHOOL YEAR	K	1	2	3	4	5	6	7	8	9	10	11	12	K-4	5-6	7-8	9-12	K-12
2012	26	12	2	2	4	0	-3	2	1	-25	-5	-2	-4	46	-3	3	-35	10
2013	20	17	2	2	3	1	-3	2	1	-27	-5	-2	-4	43	-2	3	-37	7
2014	17	13	3	2	3	0	-3	2	1	-21	-5	-2	-4	37	-3	3	-32	5
2015	19	12	2	3	2	1	-2	2	1	-26	-4	-2	-4	37	-2	3	-36	3
2016	19	12	2	2	4	1	-3	1	1	-23	-5	-2	-4	38	-2	3	-34	5
2017	24	12	2	2	3	1	-2	1	1	-25	-4	-2	-3	43	-2	2	-34	9
2018	23	15	2	2	2	1	-3	1	1	-20	-5	-2	-4	44	-3	2	-30	14
2019	24	14	2	2	3	1	-3	2	1	-20	-4	-2	-4	45	-2	3	-29	17
2020	24	15	2	2	3	0	-2	1	1	-17	-4	-1	-4	46	-2	3	-26	20
2021	24	15	3	2	3	0	-2	1	1	-25	-3	-2	-3	47	-2	2	-33	14

LOW BIRTHS

APPENDIX TABLE 5-E
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOLS ENROLLMENT PROJECTIONS
BY *THE COHORT-SURVIVAL METHOD*, 2012-2021

3-Year Trend (Low Projections)

	K	K-4	5-6	7-8	9-12	K-12
2011	**101**	**696**	**325**	**358**	**582**	**1961**
2012	**134**	**687**	**337**	**327**	**580**	**1930**
2013	**101**	**635**	**326**	**322**	**577**	**1860**
2014	**88**	**604**	**301**	**334**	**558**	**1797**
2015	**95**	**576**	**270**	**323**	**558**	**1726**
2016	**97**	**571**	**252**	**299**	**541**	**1663**
2017	**101**	**532**	**266**	**267**	**530**	**1595**
2018	**96**	**526**	**266**	**249**	**518**	**1559**
2019	**102**	**540**	**216**	**263**	**484**	**1503**
2020	**99**	**545**	**208**	**263**	**449**	**1465**
2021	**101**	**548**	**217**	**214**	**434**	**1413**
Changes:						
2011-16	**-4**	**-125**	**-73**	**-59**	**-41**	**-298**
2016-21	**4**	**-22**	**-35**	**-85**	**-107**	**-250**
2011-21	**0**	**-148**	**-108**	**-144**	**-148**	**-548**
2011-16	**-4.1%**	**-18.0%**	**-22.6%**	**-16.5%**	**-7.0%**	**-15.2%**
2016-21	**4.2%**	**-3.9%**	**-13.9%**	**-28.5%**	**-19.8%**	**-15.0%**
2011-21	**-0.1%**	**-21.2%**	**-33.4%**	**-40.3%**	**-25.4%**	**-27.9%**

Weighted 3-Year Trend

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	136	688	336	327	582	1933
2013	104	639	325	320	580	1864
2014	91	609	300	331	562	1802
2015	97	583	269	320	561	1732
2016	99	580	249	297	543	1669
2017	102	540	266	265	530	1601
2018	98	533	269	245	518	1565
2019	104	544	221	262	484	1510
2020	100	549	211	265	448	1473
2021	102	551	218	217	434	1421
Changes:						
2011-16	-2	-116	-76	-61	-39	-292
2016-21	3	-29	-31	-80	-109	-248
2011-21	1	-145	-107	-141	-148	-540
2011-16	-2.2%	-16.6%	-23.4%	-17.1%	-6.7%	-14.9%
2016-21	3.4%	-5.0%	-12.3%	-26.9%	-20.0%	-14.8%
2011-21	1.1%	-20.8%	-32.8%	-39.4%	-25.3%	-27.5%

5-Year Trend

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	139	694	337	327	575	1932
2013	106	650	328	320	571	1868
2014	93	626	302	332	550	1810
2015	99	603	270	323	547	1743
2016	101	603	253	298	531	1686
2017	105	562	277	266	519	1624
2018	100	555	282	250	508	1595
2019	107	569	230	272	475	1546
2020	103	574	221	278	441	1514
2021	105	578	230	226	435	1468
Changes:						
2011-16	0	-93	-72	-60	-51	-275
2016-21	4	-26	-23	-72	-96	-218
2011-21	4	-118	-95	-132	-147	-493
2011-16	0.0%	-13.3%	-22.0%	-16.7%	-8.7%	-14.0%
2016-21	3.8%	-4.2%	-9.2%	-24.3%	-18.1%	-12.9%
2011-21	3.9%	-17.0%	-29.2%	-36.9%	-25.3%	-25.1%

Weighted 5-Year Trend

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	138	692	336	327	578	1933
2013	105	646	326	320	575	1867
2014	92	619	301	332	556	1808
2015	98	595	269	322	554	1740
2016	100	594	252	298	537	1681
2017	104	554	273	266	525	1617
2018	99	546	277	249	514	1585
2019	105	559	226	269	480	1533
2020	102	564	217	273	445	1499
2021	104	567	225	223	436	1451
Changes:						
2011-16	-1	-102	-73	-60	-45	-280
2016-21	4	-27	-27	-75	-101	-230
2011-21	3	-129	-100	-135	-146	-510
2011-16	-0.9%	-14.6%	-22.5%	-16.8%	-7.7%	-14.3%
2016-21	3.7%	-4.5%	-10.6%	-25.2%	-18.9%	-13.7%
2011-21	2.7%	-18.5%	-30.7%	-37.8%	-25.1%	-26.0%

10-Year Trend Projections (High)

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	146	702	339	330	580	1951
2013	111	662	333	326	577	1898
2014	97	645	307	341	560	1853
2015	104	627	275	334	566	1802
2016	106	633	259	309	554	1755
2017	111	590	290	276	547	1703
2018	106	584	301	260	536	1681
2019	112	599	244	291	504	1638
2020	109	604	236	303	470	1612
2021	111	609	246	245	470	1569
Changes:						
2011-16	5	-63	-66	-49	-28	-206
2016-21	4	-24	-13	-64	-85	-186
2011-21	10	-87	-79	-113	-112	-392
2011-16	5.1%	-9.0%	-20.3%	-13.7%	-4.8%	-10.5%
2016-21	4.1%	-3.8%	-5.1%	-20.6%	-15.3%	-10.6%
2011-21	9.4%	-12.5%	-24.4%	-31.5%	-19.3%	-20.0%

Middle Projections (Avg. of High and Low)

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	140	694	338	328	580	1940
2013	106	649	330	324	577	1879
2014	93	624	304	337	559	1825
2015	100	601	272	328	562	1764
2016	102	602	255	304	548	1709
2017	106	561	278	271	539	1649
2018	101	555	283	255	527	1620
2019	107	570	230	277	494	1571
2020	104	575	222	283	459	1538
2021	106	579	231	230	452	1491
Changes:						
2011-16	1	-94	-70	-54	-34	-252
2016-21	4	-23	-24	-74	-96	-218
2011-21	5	-117	-94	-128	-130	-470
2011-16	0.5%	-13.5%	-21.5%	-15.1%	-5.9%	-12.9%
2016-21	4.2%	-3.9%	-9.4%	-24.5%	-17.5%	-12.7%
2011-21	4.7%	-16.9%	-28.9%	-35.9%	-22.4%	-24.0%

MIDDLE BIRTHS

TABLE 5-F
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOLS ENROLLMENT PROJECTIONS
BY *THE COHORT-SURVIVAL METHOD*, 2012-2021

3-Year Trend

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	134	687	337	327	580	1930
2013	101	635	326	322	577	1860
2014	88	604	301	334	558	1797
2015	95	576	270	323	558	1726
2016	98	572	252	299	541	1664
2017	112	545	266	267	530	1607
2018	108	551	266	249	518	1584
2019	114	577	216	263	484	1540
2020	110	594	208	263	449	1514
2021	112	609	218	214	434	1475
Changes:						
2011-16	-3	-124	-73	-59	-41	-297
2016-21	14	37	-34	-85	-107	-189
2011-21	11	-87	-107	-144	-148	-486
2011-16	-2.9%	-17.8%	-22.6%	-16.5%	-7.0%	-15.1%
2016-21	14.3%	6.5%	-13.4%	-28.5%	-19.8%	-11.4%
2011-21	10.9%	-12.5%	-33.0%	-40.3%	-25.4%	-24.8%

Weighted 3-Year Trend (Low)

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	136	688	336	327	582	1933
2013	104	639	325	320	580	1864
2014	91	609	300	331	562	1802
2015	97	583	269	320	561	1732
2016	100	581	249	297	543	1670
2017	113	553	266	265	530	1613
2018	109	557	269	245	518	1590
2019	115	581	221	262	484	1547
2020	112	598	211	265	448	1522
2021	113	612	220	217	434	1484
Changes:						
2011-16	-1	-115	-76	-61	-39	-291
2016-21	13	31	-29	-80	-109	-187
2011-21	12	-84	-105	-141	-148	-477
2011-16	-1.0%	-16.5%	-23.4%	-17.1%	-6.7%	-14.8%
2016-21	13.5%	5.3%	-11.8%	-26.9%	-20.0%	-11.2%
2011-21	12.3%	-12.0%	-32.4%	-39.4%	-25.3%	-24.3%

5-Year Trend

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	139	694	337	327	575	1932
2013	106	650	328	320	571	1868
2014	93	626	302	332	550	1810
2015	99	603	270	323	547	1743
2016	102	605	253	298	531	1687
2017	116	575	277	266	519	1637
2018	112	581	282	250	508	1620
2019	118	608	230	272	475	1584
2020	115	626	221	278	441	1566
2021	116	641	231	226	435	1534
Changes:						
2011-16	1	-91	-72	-60	-51	-274
2016-21	14	37	-22	-72	-96	-154
2011-21	15	-55	-94	-132	-147	-427
2011-16	1.3%	-13.1%	-22.0%	-16.7%	-8.7%	-14.0%
2016-21	13.8%	6.1%	-8.7%	-24.3%	-18.1%	-9.1%
2011-21	15.3%	-7.8%	-28.8%	-36.9%	-25.3%	-21.8%

Weighted 5-Year Trend (Moderate)

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	138	692	336	327	578	1933
2013	105	646	326	320	575	1867
2014	92	619	301	332	556	1808
2015	98	595	269	322	554	1740
2016	101	595	252	298	537	1682
2017	115	566	273	266	525	1629
2018	111	571	277	249	514	1610
2019	117	597	226	269	480	1571
2020	113	615	217	273	445	1550
2021	115	630	227	223	436	1515
Changes:						
2011-16	0	-101	-73	-60	-45	-279
2016-21	14	34	-25	-75	-101	-167
2011-21	14	-66	-98	-135	-146	-446
2011-16	0.3%	-14.5%	-22.5%	-16.8%	-7.7%	-14.2%
2016-21	13.7%	5.8%	-10.1%	-25.2%	-18.9%	-9.9%
2011-21	14.0%	-9.5%	-30.3%	-37.8%	-25.1%	-22.7%

10-Year Trend Projections (High)

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	146	702	339	330	580	1951
2013	111	662	333	326	577	1898
2014	97	645	307	341	560	1853
2015	104	627	275	334	566	1802
2016	107	634	259	309	554	1756
2017	123	604	290	276	547	1717
2018	118	610	301	260	536	1708
2019	124	640	244	291	504	1678
2020	121	659	236	303	470	1667
2021	123	676	247	245	470	1638
Changes:						
2011-16	6	-62	-66	-49	-28	-205
2016-21	15	42	-12	-64	-85	-118
2011-21	22	-20	-78	-113	-112	-323
2011-16	6.4%	-8.8%	-20.3%	-13.7%	-4.8%	-10.4%
2016-21	14.2%	6.6%	-4.5%	-20.6%	-15.3%	-6.7%
2011-21	21.5%	-2.9%	-23.9%	-31.5%	-19.3%	-16.5%

Middle Projections (Avg. of High and Low)

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	140	694	338	328	580	1940
2013	106	649	330	324	577	1879
2014	93	624	304	337	559	1825
2015	100	601	272	328	562	1764
2016	103	603	255	304	548	1710
2017	117	574	278	271	539	1662
2018	113	581	283	255	527	1646
2019	119	608	230	277	494	1609
2020	115	626	222	283	459	1590
2021	117	643	233	230	452	1556
Changes:						
2011-16	2	-93	-70	-54	-34	-251
2016-21	15	39	-23	-74	-96	-154
2011-21	16	-53	-92	-128	-130	-405
2011-16	1.7%	-13.3%	-21.5%	-15.1%	-5.9%	-12.8%
2016-21	14.2%	6.5%	-8.9%	-24.5%	-17.5%	-9.0%
2011-21	16.2%	-7.7%	-28.4%	-35.9%	-22.4%	-20.6%

HIGH BIRTHS

TABLE 5-G
REGIONAL SCHOOL DISTRICT 13 PUBLIC SCHOOLS ENROLLMENT PROJECTIONS
BY *THE COHORT-SURVIVAL METHOD*, 2012-2021

3-Year Trend

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	134	687	337	327	580	1930
2013	101	635	326	322	577	1860
2014	88	604	301	334	558	1797
2015	95	576	270	323	558	1726
2016	99	573	252	299	541	1665
2017	123	557	266	267	530	1619
2018	119	575	266	249	518	1608
2019	125	613	216	263	484	1576
2020	121	643	208	263	449	1563
2021	123	669	219	214	434	1537
Changes:						
2011-16	-2	-123	-73	-59	-41	-296
2016-21	24	96	-32	-85	-107	-128
2011-21	22	-27	-106	-144	-148	-424
2011-16	-1.8%	-17.6%	-22.6%	-16.5%	-7.0%	-15.1%
2016-21	24.1%	16.8%	-12.8%	-28.5%	-19.8%	-7.7%
2011-21	21.9%	-3.8%	-32.5%	-40.3%	-25.4%	-21.6%

Weighted 3-Year Trend (Low)

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	136	688	336	327	582	1933
2013	104	639	325	320	580	1864
2014	91	609	300	331	562	1802
2015	97	583	269	320	561	1732
2016	101	583	249	297	543	1671
2017	124	565	266	265	530	1625
2018	120	582	269	245	518	1615
2019	126	618	221	262	484	1584
2020	123	648	211	265	448	1572
2021	125	673	221	217	434	1546
Changes:						
2011-16	0	-113	-76	-61	-39	-290
2016-21	24	91	-28	-80	-109	-126
2011-21	24	-23	-104	-141	-148	-415
2011-16	0.1%	-16.3%	-23.4%	-17.1%	-6.7%	-14.8%
2016-21	23.2%	15.6%	-11.2%	-26.9%	-20.0%	-7.5%
2011-21	23.4%	-3.3%	-32.0%	-39.4%	-25.3%	-21.2%

5-Year Trend

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	139	694	337	327	575	1932
2013	106	650	328	320	571	1868
2014	93	626	302	332	550	1810
2015	99	603	270	323	547	1743
2016	103	606	253	298	531	1689
2017	128	587	277	266	519	1649
2018	123	606	282	250	508	1646
2019	130	646	230	272	475	1623
2020	126	677	221	278	441	1617
2021	128	705	233	226	435	1599
Changes:						
2011-16	2	-90	-72	-60	-51	-272
2016-21	24	100	-21	-72	-96	-90
2011-21	27	9	-92	-132	-147	-362
2011-16	2.5%	-13.0%	-22.0%	-16.7%	-8.7%	-13.9%
2016-21	23.7%	16.4%	-8.1%	-24.3%	-18.1%	-5.3%
2011-21	26.7%	1.3%	-28.4%	-36.9%	-25.3%	-18.5%

Weighted 5-Year Trend

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	138	692	336	327	578	1933
2013	105	646	326	320	575	1867
2014	92	619	301	332	556	1808
2015	98	595	269	322	554	1740
2016	102	597	252	298	537	1684
2017	126	578	273	266	525	1642
2018	122	596	277	249	514	1635
2019	128	635	226	269	480	1609
2020	125	665	217	273	445	1601
2021	127	692	228	223	436	1579
Changes:						
2011-16	1	-99	-73	-60	-45	-277
2016-21	24	96	-24	-75	-101	-104
2011-21	26	-4	-97	-135	-146	-382
2011-16	1.5%	-14.3%	-22.5%	-16.8%	-7.7%	-14.1%
2016-21	23.5%	16.1%	-9.5%	-25.2%	-18.9%	-6.2%
2011-21	25.3%	-0.5%	-29.9%	-37.8%	-25.1%	-19.5%

10-Year Trend Projections (High)

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	146	702	339	330	580	1951
2013	111	662	333	326	577	1898
2014	97	645	307	341	560	1853
2015	104	627	275	334	566	1802
2016	109	636	259	309	554	1758
2017	135	617	290	276	547	1730
2018	130	637	301	260	536	1734
2019	137	680	244	291	504	1719
2020	133	713	236	303	470	1721
2021	135	743	249	245	470	1707
Changes:						
2011-16	8	-60	-66	-49	-28	-203
2016-21	26	107	-10	-64	-85	-51
2011-21	34	47	-76	-113	-112	-254
2011-16	7.7%	-8.7%	-20.3%	-13.7%	-4.8%	-10.4%
2016-21	24.0%	16.9%	-3.9%	-20.6%	-15.3%	-2.9%
2011-21	33.5%	6.8%	-23.5%	-31.5%	-19.3%	-13.0%

Middle Projections (Avg. of High and Low)

	K	K-4	5-6	7-8	9-12	K-12
2011	101	696	325	358	582	1961
2012	140	694	338	328	580	1940
2013	106	649	330	324	577	1879
2014	93	624	304	337	559	1825
2015	100	601	272	328	562	1764
2016	104	604	255	304	548	1711
2017	129	587	278	271	539	1674
2018	124	606	283	255	527	1671
2019	131	647	230	277	494	1648
2020	127	678	222	283	459	1642
2021	129	706	234	230	452	1622
Changes:						
2011-16	3	-92	-70	-54	-34	-250
2016-21	25	102	-21	-74	-96	-90
2011-21	28	10	-91	-128	-130	-339
2011-16	2.9%	-13.2%	-21.5%	-15.1%	-5.9%	-12.7%
2016-21	24.0%	16.9%	-8.3%	-24.5%	-17.5%	-5.2%
2011-21	27.7%	1.5%	-28.0%	-35.9%	-22.4%	-17.3%

SECTION 6

SCHOOL-BY-SCHOOL ENROLLMENT PROJECTIONS

6.1 Introduction

In this section, we present the enrollments for each of Regional School District 13's three elementary schools: Brewster Elementary School (BES), Korn Elementary School (KES), and Lyman Elementary School (LES). For these three elementary schools we had to allocate the district-wide K-4 enrollments to three elementary schools. On the other hand, two middle schools, Memorial Middle School (MMS) and Strong Middle School (SMS) as well as Coginchaug Regional High School (CRHS), do not require enrollment allocation to each school because district-wide enrollment projections present the projected enrollments of each school.

6.2 Individual School Enrollment Data

The first step to project individual elementary school enrollments is to obtain relevant enrollment data, which turned out to be not an easy task for the regional district. RSD 13's towns of Durham and Middlefield acted as elementary school districts or zones that send their resident students to the three RSD 13's elementary schools. Thus, the data had to be organized in terms of towns, then by schools, and then by grade. Table 6.1 presents such data in the three panels. Panel A shows the number of Durham K-4 resident students attending BES, PES and LES schools for each school year during the last ten years, between 2002 and 2011. Similarly, Panel B shows the distribution of Middlefield's K-4 children between the three elementary schools in RSD 13, and Panel C combines the Panel A and B data for RSD 13 as a whole.

When the relevant enrollment data were initially received from the RSD 13 public schools, we found that the sum of the data did not match the district-wide enrollment data published by the Connecticut State Department of Education (CSDE). Thus, we spent a considerable amount of time trying to reconcile these discrepancies (ranging one to six students) and to match the rows and columns of the data matrices. The 2011 enrollment data presented special problems because the 2011 data had not been published by the CSDE as yet so that there was no way to verify the accuracy of the data presented. Although we requested computer printouts of the 2011 enrollment data submitted to the CSDE in 2011 and the annual enrollment data sheet provided to the RSD 13's Board of Education, these were not made available. After several revisions to the data, the 2011 enrollment data are deemed to be accurate enough to be used for enrollment projections although still 'provisional' until the Connecticut State Department of Education publishes the verified data.

TABLE 6.1
2002-2011 ENROLLMENT HISTORY OF DURHAM, MIDDLEFIELD AND RSD 13 TOTAL

Panel A: Durham Residents Attending Brewster, Korn And Lyman Elementary Schools
2002-2011

SCH	BREWSTER-D				KORN-D		LYMAN-D					SCH	DURHAM K-4 TOTAL					
YR	PK	K	1	2	3	4	K	1	2	3	4	YR	PK	K	1	2	3	4
2002	7	65	68	70	63	60	39	36	46	48	39	2002	7	104	104	116	111	99
2003	17	59	73	69	70	63	36	44	35	49	53	2003	17	95	117	104	119	116
2004	27	74	68	77	69	78	32	39	47	39	50	2004	27	106	107	124	108	128
2005	24	66	81	72	77	74	28	36	40	44	38	2005	24	94	117	112	121	112
2006	26	55	74	83	76	79	37	32	38	41	43	2006	26	92	106	121	117	122
2007	27	56	63	73	82	75	26	40	31	39	43	2007	27	82	103	104	121	118
2008	23	68	63	68	70	76	36	36	41	34	41	2008	23	104	99	109	104	117
2009	12	39	78	68	70	70	25	38	35	43	31	2009	12	64	116	103	113	101
2010	18	52	47	78	68	83	27	28	36	37	40	2010	18	79	75	114	105	123
2011	9	46	55	48	77	65	23	34	27	41	37	2011	9	69	89	75	118	102

Panel B: Middlefield Residents Attending Brewster, Korn And Lyman Elementary Schools
2002-2011

	BREWSTER-M				KORN-M		LYMAN-M						MIDDLEFIELD K-4 TOTAL					
	PK	K	1	2	3	4	K	1	2	3	4		PK	K	1	2	3	4
2002	6	21	24	32	29	32	23	35	35	23	41	2002	6	44	59	67	52	73
2003	12	28	25	24	33	32	23	26	34	30	22	2003	12	51	51	58	63	54
2004	8	27	26	24	23	34	27	23	31	33	30	2004	8	54	49	55	56	64
2005	12	20	32	26	27	24	27	34	24	30	34	2005	12	47	66	50	57	58
2006	8	28	20	32	25	29	31	26	34	27	30	2006	8	59	46	66	52	59
2007	9	21	31	22	30	26	28	36	26	35	29	2007	9	49	67	48	65	55
2008	15	21	24	28	22	31	24	30	36	28	39	2008	15	45	54	64	50	70
2009	13	23	25	26	30	23	31	27	29	35	29	2009	13	54	52	55	65	52
2010	8	17	25	23	24	25	29	31	25	32	35	2010	8	46	56	48	56	60
2011	5	13	17	25	25	25	19	28	30	28	33	2011	5	32	45	55	53	58

Panel C: RSD 13 Residents Attending Brewster, Korn And Lyman Elementary Schools
2002-2011

	BREWSTER-RSD 13				KORN RSD 13		LYMAN-RSD 13						RSD 13 K-4 TOTAL					
	PK	K	1	2	3	4	K	1	2	3	4		PK	K	1	2	3	4
2002	13	85	92	102	92	92	62	71	81	71	80	2002	13	148	163	183	163	172
2003	29	87	98	93	103	95	59	70	69	79	75	2003	29	146	168	162	182	170
2004	35	101	94	101	92	112	59	62	78	72	80	2004	35	160	156	179	164	192
2005	36	86	113	98	104	98	55	70	64	74	72	2005	36	141	183	162	178	170
2006	34	84	94	115	101	108	68	58	73	68	73	2006	34	151	152	187	169	181
2007	36	77	94	95	112	101	54	76	57	74	72	2007	36	131	170	152	186	173
2008	38	88	87	96	92	107	60	66	77	62	80	2008	38	148	153	173	154	187
2009	25	62	103	94	100	93	56	65	64	78	60	2009	25	118	168	158	178	153
2010	26	69	72	101	92	108	56	59	61	69	75	2010	26	125	131	162	161	183
2011	14	59	72	73	102	90	42	62	57	69	70	2011	14	101	134	130	171	160

Source: Connecticut State Department of Education, CEDaR and 'Public and Nonpublic School Enrollments' (see Appendix Tables 2.8a through 2.13 in Section 2 of this report); Regional School District #13 Public Schools (John DeMeo).

6.3 Individual School Enrollment Projections and Methodology

Table 6.2 presents the enrollment projections for individual schools prepared for Durham, Middlefield and RSD 13. We used the Cohort Survival Method and the Share-Ratio Method to

project individual school enrollments over the next ten years, between 2012 and 2021. When the sum of the individual schools' grade-by-grade enrollments differed from the district-wide projections, we reconciled the individual school's data to match the district-wide data. The sum of grade enrollments in some cases differed from the totals due to many rounds of computations, which required data conciliations.

TABLE 6.2

ENROLLMENT PROJECTIONS FOR DURHAM, MIDDLEFIELD AND RSD 13, 2012-2021

(Consistent with the District-Wide Middle Projections As Of October 1 of School Year)

Panel A: Durham Residents Attending Brewster, Korn And Lyman Elementary Schools

Sch	BREWSTER-D				KORN-D		LYMAN-D					Sch	DURHAM K-4 TOTAL					
Yr	PK*	K	1	2	3	4	K	1	2	3	4	Yr	PK	K	1	2	3	4
2012	19	57	51	57	48	80	32	27	33	29	40	2012	19	89	78	90	77	120
2013	19	46	64	53	57	49	25	37	26	36	29	2013	19	71	101	80	93	78
2014	19	44	51	67	53	58	24	29	36	28	36	2014	19	68	80	102	81	94
2015	19	39	49	53	66	55	22	29	29	39	28	2015	19	61	77	82	105	83
2016	19	42	43	51	52	68	23	26	28	31	38	2016	19	65	69	79	83	106
2017	19	43	47	46	50	54	24	27	24	30	30	2017	19	67	73	70	80	85
2018	19	42	49	48	45	52	23	28	26	26	29	2018	19	65	76	75	72	82
2019	19	45	47	50	48	47	25	27	27	28	26	2019	19	71	74	78	76	73
2020	19	43	51	49	50	50	24	29	26	30	28	2020	19	67	80	75	80	77
2021	19	44	48	53	49	52	24	28	29	29	29	2021	19	68	76	81	77	81

Panel B: Middlefield Residents Attending Brewster, Korn And Lyman Elementary Schools,

Sch	BREWSTER-M				KORN-M		LYMAN-M					Sch	MIDDLEFIELD K-4 TOTAL					
Yr	PK*	K	1	2	3	4	K	1	2	3	4	Yr	PK	K	1	2	3	4
2012	10	21	14	17	25	24	30	20	28	32	30	2012	10	51	34	45	57	54
2013	10	14	23	14	17	25	21	32	19	29	33	2013	10	36	55	34	46	57
2014	10	10	16	23	14	16	15	22	32	21	30	2014	10	25	38	54	35	46
2015	10	16	11	16	23	14	23	15	22	33	22	2015	10	39	26	38	56	35
2016	10	15	17	11	16	22	23	25	15	23	35	2016	10	38	42	26	39	57
2017	10	20	17	18	11	16	30	24	24	16	24	2017	10	50	41	42	27	39
2018	10	19	22	17	17	11	28	31	23	26	16	2018	10	47	53	40	43	27
2019	10	19	21	22	17	17	29	30	31	25	26	2019	10	48	51	53	41	43
2020	10	19	21	21	22	16	29	30	29	33	26	2020	10	48	52	50	54	42
2021	10	20	22	22	21	21	29	30	30	31	34	2021	10	49	52	51	52	55

Panel C: RSD 13 Residents Attending Brewster, Korn And Lyman Elementary Schools

Sch	BREWSTER-RSD 13				KORN-RSD		LYMAN-RSD 13					Sch	RSD 13 K-4 TOTAL					
Yr	PK*	K	1	2	3	4	K	1	2	3	4	Yr	PK	K	1	2	3	4
2012	29	78	65	74	73	104	62	47	61	61	70	2012	29	140	113	135	133	173
2013	29	60	86	68	74	74	46	69	46	65	62	2013	29	106	156	113	138	135
2014	29	54	67	89	67	75	39	51	67	49	66	2014	29	93	118	157	116	140
2015	29	55	60	69	88	68	45	44	51	72	49	2015	29	100	104	119	161	118
2016	29	58	60	62	68	90	45	50	43	54	73	2016	29	103	111	105	122	163
2017	29	64	64	63	61	70	54	51	48	46	54	2017	29	117	114	112	107	124
2018	29	61	71	65	62	63	52	59	50	52	46	2018	29	113	130	115	114	109
2019	29	65	68	73	65	64	54	57	58	53	52	2019	29	119	125	131	118	116
2020	29	63	73	70	71	66	53	59	56	63	54	2020	29	115	132	126	134	119
2021	29	64	70	74	69	73	53	58	58	60	63	2021	29	117	128	133	129	136

Source: H. C Planning Consultants, Inc. (see Middle Projections)

* PK enrollments cannot be projected. Therefore, these PK figures are estimated by ten-year averages.

6.4 Summary of Enrollment Projections for Each School

Table 6.3 presents the results of ten-year enrollment projections for each elementary school in Regional School District 13 along with the middle and high school enrollment data. In addition, we provided graphs of Table 6.3 data, Figures 6-1 and 6-2 on the following pages.

TABLE 6.3
10-YEAR ENROLLMENT PROJECTIONS FOR INDIVIDUAL SCHOOLS
BASED ON THE MIDDLE PROJECTIONS
REGIONAL SCHOOL DISTRICT 13, CONNECTICUT, 2012-2021

	BES K-2	KES 3-4	LES K-4	Total K-4	MMS 5-6	SMS 7-8	Total 5-8	CRHS 9-12	TOTAL K-12
	HISTORY:								
2002	280	184	365	829	359	343	702	575	2120
2003	278	198	352	828	354	360	714	581	2153
2004	296	204	351	851	353	362	715	580	2181
2005	297	202	335	834	365	368	733	567	2170
2006	292	209	339	840	360	352	712	578	2164
2007	266	213	333	812	349	360	709	583	2139
2008	272	199	345	816	353	350	703	566	2123
2009	259	193	323	775	360	346	706	576	2082
2010	242	200	320	762	334	350	684	574	2046
2011	204	192	300	696	325	358	683	582	1983
	PROJECTIONS:								
2012	217	176	301	694	338	328	666	580	1940
2013	214	147	288	649	330	324	653	577	1879
2014	210	141	273	624	304	337	641	559	1825
2015	183	157	261	601	272	328	601	562	1764
2016	180	158	265	603	255	304	559	548	1710
2017	191	131	252	574	278	271	549	539	1662
2018	197	125	258	581	283	255	538	527	1646
2019	205	128	275	608	230	277	507	494	1609
2020	205	137	284	626	222	283	505	459	1590
2021	209	142	292	643	233	230	462	452	1556
2006-2011	(Last Five Years)								
Number	-88	-17	-39	-144	-35	6	-29	4	-181
Percent	-30%	-8%	-12%	-17%	-10%	2%	-4%	1%	-8%
2011-2016	(First 5-Year Projection Period)								
Number	-24	-34	-35	-93	-70	-54	-124	-34	-273
Percent	-12%	-17%	-12%	-13%	-21%	-15%	-18%	-6%	-14%
2016-2021	(Second 5-Year Projection Period)								
Number	29	-16	26	39	-23	-74	-97	-96	-154
Percent	16%	-10%	10%	7%	-9%	-24%	-17%	-18%	-9%
2011-2021	(10-Year Projection Period)								
Number	5	-50	-8	-53	-92	-128	-221	-130	-427
Percent	2%	-26%	-3%	-8%	-28%	-36%	-32%	-22%	-22%

Note: Totals may be one or two off due to rounding.

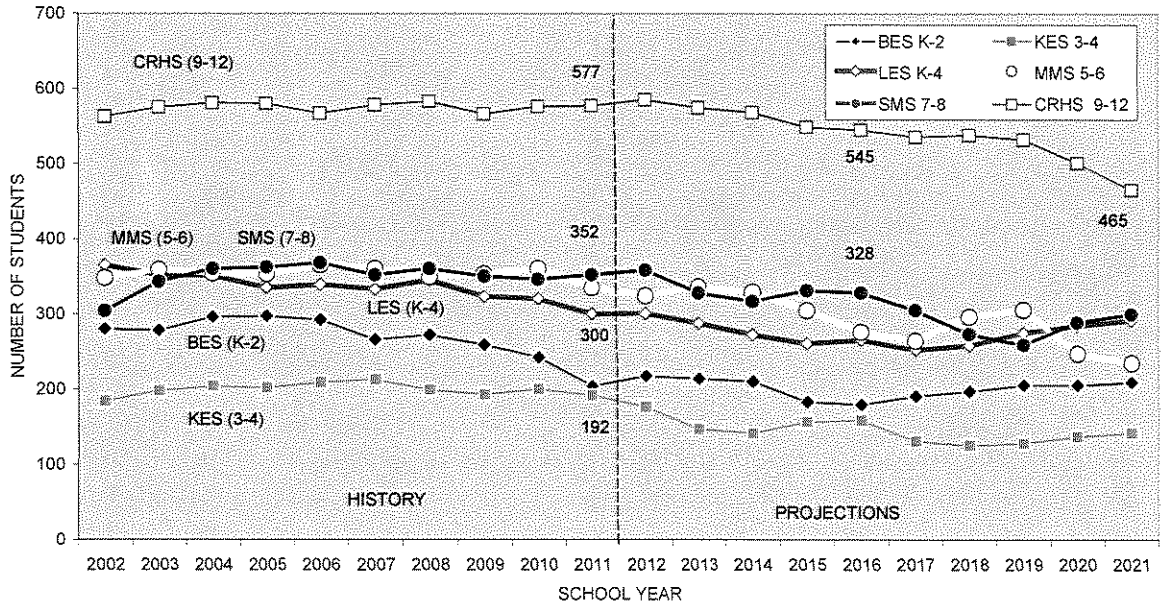
Note the following from Table 6.3 and Figure 6-1:

A. Elementary School Enrollment Projections

- Last Five Years: During the past five years (between 2006 and 2011), K-4 enrollments in RSD 13 declined by 144 students or by 17% (see the bottom rows of Table 6.3). Note that BES experienced the largest decline by 30% (-88 students) followed by LES losing by 12% (39 students) and KES declining by 8% (17 students).

- First Five Years Forecasted: It is projected that the pattern of K-4 enrollment decline will continue over the first 5-year projection period but will then decline somewhat more slowly from a level of 696 students in 2011 to 603 students in 2016, a reduction of 93 students or -13%. Therefore, it is projected that the enrollments for all three elementary schools will decline over the next five years, but the extent of the decline will vary among the three schools: Table 6.3 shows a decline of 24 students (-12%) in BES, a similar decline of 35 students (-12%) in LES, and a reduction of 34 students (-17%) in KES. These projections are prepared based on five years of actual birth data between 2012 and 2016.

FIG. 6-1
SCHOOL ENROLLMENT PROJECTIONS BY SCHOOL
REGIONAL SCHOOL DISTRICT 13, 2002-2021



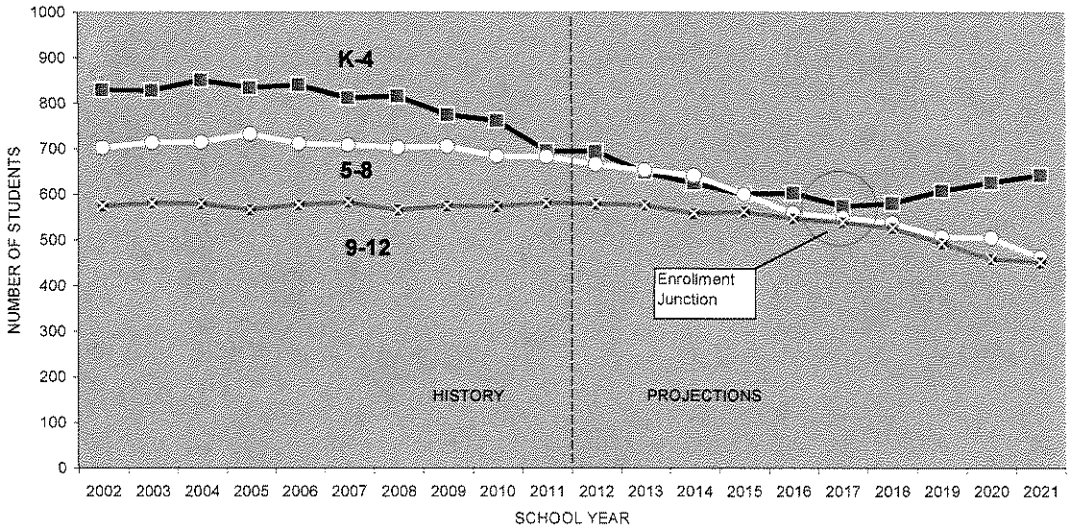
The Second Five-Year Projections: The second five-year set of enrollment forecasts are subject to greater variances because the enrollments were projected by applying the 'assumed' future births. It is projected that the declining enrollment trends of the first five years will slow down somewhat during the second five years of the projection period, given that the assumed numbers of births prove to be accurate. According to Table 6.3 and Figure 6-1, KES will lose 16 students (-10%) between 2016 and 2021, but the two other schools are projected to *gain* enrollments: BES

will gain 29 students or 16% and LES will also *gain* 26 students (+10%) over the second five-year projection period. Note, however, that if the statewide and regional economies improve very slowly, all three schools are likely to decline further rather than improve in enrollments.

B. Comparison of Grades K-4, 5-8 and 9-12 Enrollment Projections

We have already discussed in detail the grades 5-6, 7-8 and 9-12 projections in Section 5 of this report; accordingly, we are not going to discuss again the enrollment projections for MMS, SMS and CRHS. Although Figure 6-1 shows the relative growth and decline trends for all six schools in RSD 13, the overlays of all six enrollment curves make it difficult to compare them. For this reason, we have prepared Fig. 6-2 in which we consolidated enrollments for all three elementary schools to derive total K-4 enrollments, and also combined the enrollments of two middle schools, deriving the total grades 5-8 enrollments. Therefore, we now have total K-4 (5 grades), total grades 5-8 (4 grades) and total 9-12 (4 grades) enrollments, which we then charted. Accordingly, as of 2002, the K-4 enrollment curve is located above the middle school enrollment curve because grades K-4 totals have one more grade than the grades 5-8 totals; and the high school enrollment curve is found to be below the middle school enrollment curve because a very high percentage of high school students are enrolled at nonpublic schools.

FIG. 6-2
COMPARISON OF GRADES K-4, 5-8 AND 9-12 ENROLLMENT
GROWTH/DECLINE TRENDS
REGIONAL SCHOOL DISTRICT 13, 2002-2021



As shown in Fig. 6-2, all three enrollment curves have been declining at different paces: K-4 enrollments declined rapidly, high school enrollment hardly changed, and middle school enrollments declined slowly since 2005. Accordingly, as we can see in a circled spot in Figure 6-2, their enrollments are projected to converge in 2017 so that their enrollments are nearly the same so that the projected enrollments in 2017 are: K-4 (574 students), 5-8 (549 students) and

9-12 (539 students), forming an enrollment junction. But, from then on, K-4 enrollment is projected to expand while middle school enrollments will continue to decline slowly and high school enrollments are projected to decline somewhat rapidly beginning in 2019, anticipating their troughs shortly. Note RSD 13 might have already reached its trough in 2021 but we cannot ascertain as a fact at this time without extending the enrollment projections beyond 2021.

6.5 Limitations of Projections

In general, enrollment projections for individual schools are fraught with difficulty for several reasons. As mentioned in Section 1 of this report, projections of small numbers are more likely to be subject to large percentage errors than are larger area projections. Furthermore, allocation *practices* of Durham and Middlefield's resident students to each elementary school may change slightly each year for various reasons.

In light of the these limitations to the school-by-school projections, it is necessary to adopt additional assumptions for projecting enrollments for individual schools in addition to the assumptions that were adopted for the district-wide enrollment projections. They are:

1. There will be no significant change in the manner by which the students from each town will be allocated to the three elementary schools.
2. School capacities will not be significantly altered by additions, new construction, demolition or withdrawal of school facilities. The school enrollments of each school are closely related to school capacities. Once the school capacities are set, then school enrollments are often allocated to each school in accordance with its capacity.
3. There will be no changes from a half-day to full-day kindergarten program and there will be no significant changes in special education and pre-kindergarten programs.

Therefore, whenever any one of these assumptions is significantly violated in the future, the projections should be readjusted or updated.

6.6 Projected School Enrollments by Grade

Note that Table 6.1 and 6.2 present the enrollment history and projections by grade and by school. In general, district-wide projections are relatively more accurate than projected enrollments for each school, and individual school enrollment projections are more accurate than projected grade enrollments. Even among grade enrollments, K and K-4 enrollment projections are likely to produce larger projection deviations than projected middle or high school enrollments. In short, the smaller the enrollment figures, the greater the margin or errors. Thus, one must use the enrollment projections with caution.

Appendix Table 6-A is prepared combining Tables 6.1,and 6.2.

SECTION 6

APPENDIX TABLES

SUMMARY APPENDIX TABLE 6-A

ELEMENTARY SCHOOL ENROLLMENT PROJECTIONS BY SCHOOL & BY GRADE
MIDDLE PROJECTIONS

Panel A: Durham Residents Attending Brewster, Korn And Lyman Elementary Schools, 2012-2021

SCH	BREWSTER-D				KORN-D		LYMAN-D					SCH	DURHAM K-4 TOTAL						BE	KE	LE	Total
YR	PK	K	1	2	3	4	K	1	2	3	4	YR	PK	K	1	2	3	4	K-2	3-4	K-4	K-4
2002	7	65	68	70	63	60	39	36	46	48	39	2002	7	104	104	116	111	99	203	123	208	534
2003	17	59	73	69	70	63	36	44	35	49	53	2003	17	95	117	104	119	116	201	133	217	551
2004	27	74	68	77	69	78	32	39	47	39	50	2004	27	106	107	124	108	128	219	147	207	573
2005	24	66	81	72	77	74	28	36	40	44	38	2005	24	94	117	112	121	112	219	151	186	556
2006	26	55	74	83	76	79	37	32	38	41	43	2006	26	92	106	121	117	122	212	155	191	558
2007	27	56	63	73	82	75	26	40	31	39	43	2007	27	82	103	104	121	118	192	157	179	528
2008	23	68	63	68	70	76	36	36	41	34	41	2008	23	104	99	109	104	117	199	146	188	533
2009	12	39	78	68	70	70	25	38	35	43	31	2009	12	64	116	103	113	101	185	140	172	497
2010	18	52	47	78	68	83	27	28	36	37	40	2010	18	79	75	114	105	123	177	151	168	496
2011	9	46	55	48	77	65	23	34	27	41	37	2011	9	69	89	75	118	102	149	142	162	453
2012	19	57	51	57	48	80	32	27	33	29	40	2012	19	89	78	90	77	120	166	128	161	454
2013	19	46	64	53	57	49	25	37	26	36	29	2013	19	71	101	80	93	78	163	106	153	421
2014	19	44	51	67	53	58	24	29	36	28	36	2014	19	68	80	102	81	94	162	111	153	426
2015	19	39	49	53	66	55	22	29	29	39	28	2015	19	61	77	82	105	83	141	120	146	407
2016	19	42	43	51	52	68	23	26	28	31	38	2016	19	65	69	79	83	106	136	121	145	402
2017	19	43	47	46	50	54	24	27	24	30	30	2017	19	67	73	70	80	85	136	105	135	376
2018	19	42	49	48	45	52	23	28	26	26	29	2018	19	65	76	75	72	82	139	97	133	369
2019	19	45	47	50	48	47	25	27	27	28	26	2019	19	71	74	78	76	73	143	95	134	371
2020	19	43	51	49	50	50	24	29	26	30	28	2020	19	67	80	75	80	77	144	100	136	379
2021	19	44	48	53	49	52	24	28	29	29	29	2021	19	68	76	81	77	81	145	100	138	383

Panel B: Middlefield Residents Attending Brewster, Korn And Lyman Elementary Schools, 2012-2021

SCH	BREWSTER-M				KORN-M		LYMAN-M					SCH	MIDDLEFIELD K-4 TOTAL						BE	KE	LE	Total
YR	PK	K	1	2	3	4	K	1	2	3	4	YR	PK	K	1	2	3	4	K-2	3-4	K-4	K-4
2002	6	21	24	32	29	32	23	35	35	23	41	2002	6	44	59	67	52	73	77	61	157	295
2003	12	28	25	24	33	32	23	26	34	30	22	2003	12	51	51	58	63	54	77	65	135	277
2004	8	27	26	24	23	34	27	23	31	33	30	2004	8	54	49	55	56	64	77	57	144	278
2005	12	20	32	26	27	24	27	34	24	30	34	2005	12	47	66	50	57	58	78	51	149	278
2006	8	28	20	32	25	29	31	26	34	27	30	2006	8	59	46	66	52	59	80	54	148	282
2007	9	21	31	22	30	26	28	36	26	35	29	2007	9	49	67	48	65	55	74	56	154	284
2008	15	21	24	28	22	31	24	30	36	28	39	2008	15	45	54	64	50	70	73	53	157	283
2009	13	23	25	26	30	23	31	27	29	35	29	2009	13	54	52	55	65	52	74	53	151	278
2010	8	17	25	23	24	25	29	31	25	32	35	2010	8	46	56	48	56	60	65	49	152	266
2011	5	13	17	25	25	25	19	28	30	28	33	2011	5	32	45	55	53	58	55	50	138	243
2012	10	21	14	17	25	24	30	20	28	32	30	2012	10	51	34	45	57	54	52	49	140	240
2013	10	14	23	14	17	25	21	32	19	29	33	2013	10	36	55	34	46	57	51	41	135	228
2014	10	10	16	23	14	16	15	22	32	21	30	2014	10	25	38	54	35	46	48	30	119	198
2015	10	16	11	16	23	14	23	15	22	33	22	2015	10	39	26	38	56	35	42	36	115	194
2016	10	15	17	11	16	22	23	25	15	23	35	2016	10	38	42	26	39	57	43	38	120	202
2017	10	20	17	18	11	16	30	24	24	16	24	2017	10	50	41	42	27	39	55	27	117	198
2018	10	19	22	17	17	11	28	31	23	26	16	2018	10	47	53	40	43	27	58	28	125	211
2019	10	19	21	22	17	17	29	30	31	25	26	2019	10	48	51	53	41	43	62	34	141	237
2020	10	19	21	21	22	16	29	30	29	33	26	2020	10	48	52	50	54	42	62	38	148	247
2021	10	20	22	22	21	21	29	30	30	31	34	2021	10	49	52	51	52	55	64	42	154	259

APPENDIX SUMMARY TABLE 6-B (CONTINUED)

ELEMENTARY SCHOOL ENROLLMENT PROJECTIONS BY SCHOOL & BY GRADE
MIDDLE PROJECTIONS

Panel C: RSD 13 Residents Attending Brewster, Korn And Lyman Elementary Schools, 2012-2021

(PK enrollments are not projected. They are 10- year averages.)

SC	BREWSTER-				KORN-		LYMAN-RSD 13					SC	DURHAM K-4 TOTAL						BE	KE	LE	Total
YR	PK	K	1	2	3	4	K	1	2	3	4	YR	PK	K	1	2	3	4	K-2	3-4	K-4	K-4
200	13	86	92	102	92	92	62	71	81	71	80	200	13	148	163	183	163	172	280	184	365	829
200	29	87	98	93	103	95	59	70	69	79	75	200	29	146	168	162	182	170	278	198	352	828
200	35	101	94	101	92	112	59	62	78	72	80	200	35	160	156	179	164	192	296	204	351	851
200	36	86	113	98	104	98	55	70	64	74	72	200	36	141	183	162	178	170	297	202	335	834
200	34	83	94	115	101	108	68	58	72	68	73	200	34	151	152	187	169	181	292	209	339	840
200	36	77	94	95	112	101	54	76	57	74	72	200	36	131	170	152	186	173	266	213	333	812
200	38	89	87	96	92	107	60	66	77	62	80	200	38	149	153	173	154	187	272	199	345	816
200	25	62	103	94	100	93	56	65	64	78	60	200	25	118	168	158	178	153	259	193	323	775
201	26	69	72	101	92	108	56	59	61	69	75	201	26	125	131	162	161	183	242	200	320	762
201	14	59	72	73	102	90	42	62	57	69	70	201	14	101	134	130	171	160	204	192	300	696
201	29	78	65	74	73	104	62	47	61	61	70	201	29	140	113	135	133	173	217	176	301	694
201	29	60	86	68	74	74	46	69	46	65	62	201	29	106	156	113	138	135	214	147	288	649
201	29	54	67	89	67	75	39	51	67	49	66	201	29	93	118	157	116	140	210	141	273	624
201	29	55	60	69	88	68	45	44	51	72	49	201	29	100	104	119	161	118	183	157	261	601
201	29	58	60	62	68	90	45	50	43	54	73	201	29	103	111	105	122	163	180	158	265	603
201	29	64	64	63	61	70	54	51	48	46	54	201	29	117	114	112	107	124	191	131	252	574
201	29	61	71	65	62	63	52	59	50	52	46	201	29	113	130	115	114	109	197	125	258	581
201	29	65	68	73	65	64	54	57	58	53	52	201	29	119	125	131	118	116	205	128	275	608
202	29	63	73	70	71	66	53	59	56	63	54	202	29	115	132	126	134	119	205	137	284	626
202	29	64	70	74	69	73	53	58	58	60	63	202	29	117	128	133	129	136	209	142	292	643

Source: Prepared by H. C. Planning Consultants, Inc.

