

Newtown

Population Projections

2000 - 2030

**Prepared for the
Town of Newtown, Connecticut**



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This report supersedes all the draft reports and other working papers that were distributed prior to its issuing date. All forecasts, projections, estimates and approximations are presented not as predictions. They are prepared based on selected past trends and a set of assumptions.

1. DEMOGRAPHIC HISTORY OF NEWTOWN

1.1 Purpose of the Study

This report presents population projections over the next 25 years, between 2005 and 2030, for the town of Newtown, Connecticut.

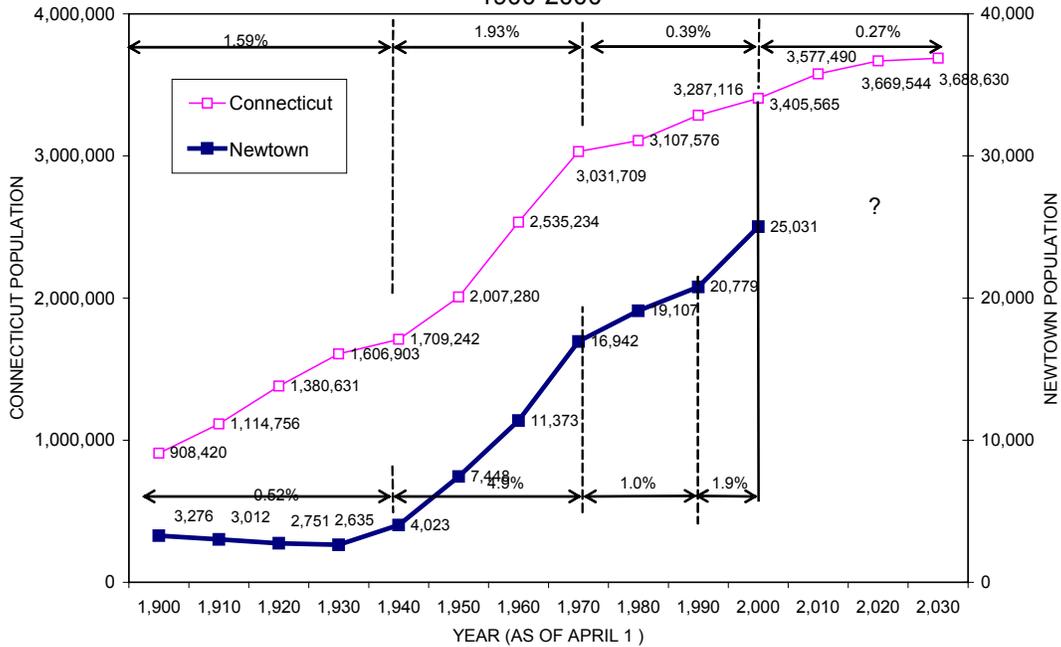
1.2 Growth Trends of Total Population in Newtown

It is much easier to understand the growth pattern of Newtown's population by comparing it to Connecticut's population growth trends in terms of similarities and differences between the two.

The Connecticut population growth trends since 1900 can be divided into three periods as shown in Figure 1-1 on the next page. For the forty years between 1900 and 1940, the state's population increased at a moderately fast pace, an annual compound rate of 1.59%. But for the next thirty years between 1940 and 1970, Connecticut's population increased at a much faster rate of 1.93% per year. Thus, the population in Connecticut increased from 1.7 million in 1940 to 3.03 million in 1970. In contrast, the state population's annual growth rate since 1970 has grown very slowly, dropping sharply to 0.39% between 1970 and the 2000. The 2000 U. S. Census of Population indicated that Connecticut's population reached slightly over 3.4 million persons. In 2005, the U. S. Census Bureau projected that Connecticut's population growth rate will further decline to 0.27% per year over the next thirty years, between 2000 and 2030.

Newtown's population growth patterns can be divided into four periods. During the first forty years since 1900, Newtown's population hardly grew: the town added only 759 persons in forty years, increasing from 2,785 persons in 1900 to 3,544 persons in 1940. The compounded annual growth rate was 0.52%. Since 1940 (or more specifically after the end of the World War II in 1945), Newtown's population increased at the annually compounded rate of 4.9% over the next thirty years, soaring to 16,942 in 1970, an addition of 12,919 persons. Subsequently, the growth rate of Newtown slowed to a rate of 1.0% per year between 1970 and 1990. However, the population growth rate of Newtown reversed itself and resumed its growth at the rate of 1.9% per year during the 1990s. Newtown's population growth pattern resulted when the nation became increasingly suburbanized during the thirty years between 1940 and 1970. When a multitude of young families settled in these neighborhoods with mostly single-family homes, they produced the large number of children now identified as baby boomers who were born between 1945 and 1964. At the same time, many families left Connecticut's central urban centers such as the City of New Haven. New Haven's population was 160,605 persons in 1940 but dwindled to 126,109 persons by 1980. In contrast, Newtown's population entered a period of exponential growth and the town's population reached 25,031 persons according the 2000 U. S. Census of population.

FIG. 1-1
POPULATION GROWTH TRENDS OF CONNECTICUT AND NEWTOWN
1900-2000



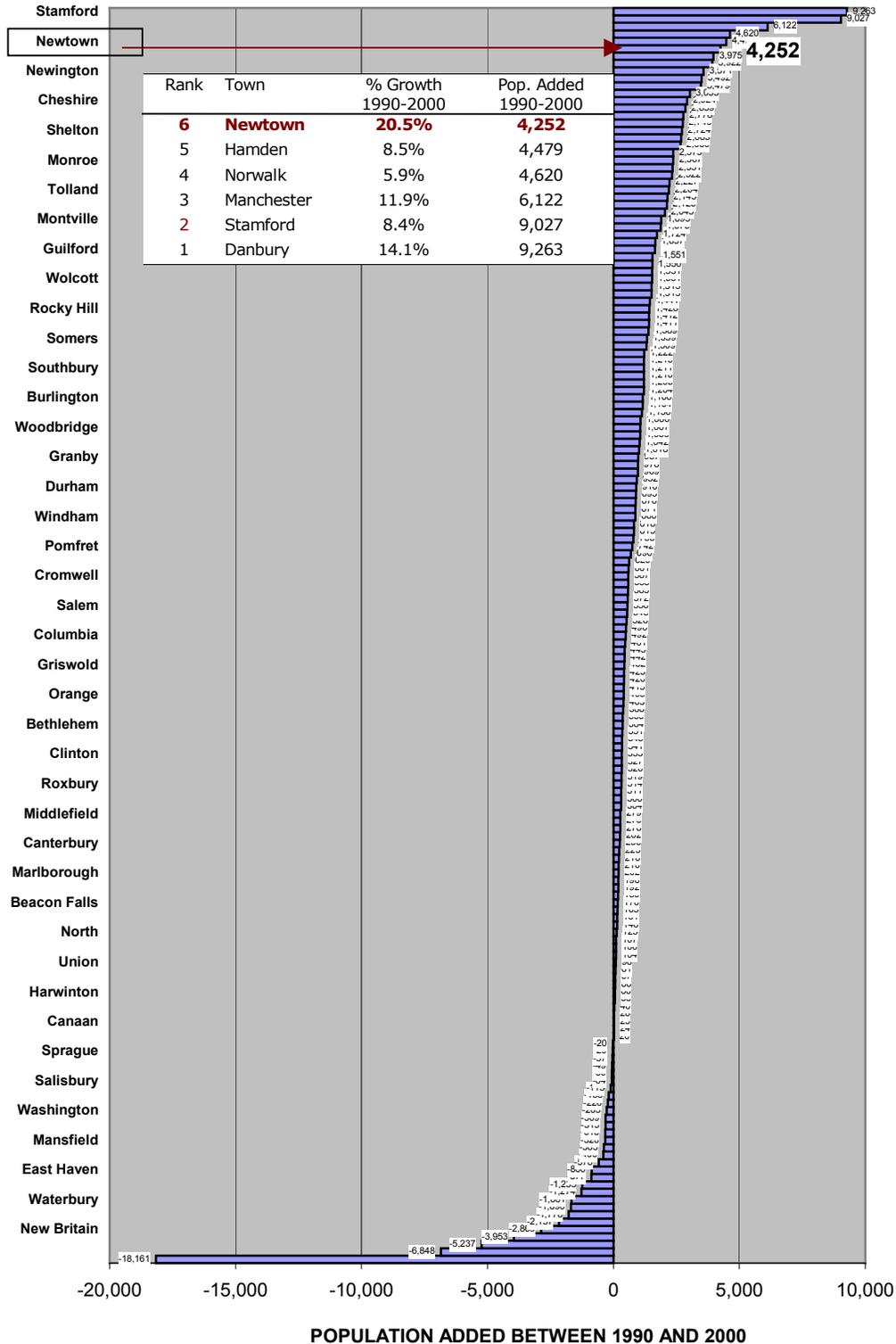
1.3 Newtown Population Compared to Other Towns in Connecticut

Figure 1-2 shows that Newtown added 4,552 persons during the last decade, between 1990 and 2000. This increase meant that Newtown ranked 6th out of 169 towns in Connecticut in terms of the number of persons added over this period. In terms of percent of growth, Newtown recorded a growth rate of 20.5% during the last decade, ranking 11th in Connecticut. In short, Newtown has been growing very fast relative to other communities in Connecticut during the 1990s.

1.4 Factors That Slow Newtown’s Population Growth

It is difficult to assume that the Newtown’s rapid growth experienced in the 1990s will continue unabated over the next twenty five years. For several reasons, it is anticipated that Newtown’s population growth will slow down over the next 25 years. First, as mentioned earlier, Connecticut’s population has been projected to slow down considerably, and Newtown’s growth patterns parallel those of Connecticut with a time lag. Second, the build-out analysis of Newtown’s residentially zoned undeveloped land indicates that over the next 25 years, the residentially zoned vacant land will be substantially developed if the current rate of new home construction in Newtown continues. Third, as this baby boomers age, the proportion of the elderly population is likely to grow much faster in relation to the rest of the population. Fourth, with less of the population which is younger, there will be fewer families with school-age children. These tendencies acting together are likely to reduce the average household size (or population multiplier per housing unit) in Newtown. As a result, even if many more new housing units are built than before, the total population of Newtown may *not* grow as fast as it used to.

FIG. 1-2 RANKING POPULATION GROWTH OF CONNECTICUT TOWNS, 1990-2000



1.5 Plan of the Report

Population projections for Newtown were prepared in three parts. In Section II, we project the *total* population of Newtown, using several different methods. We then averaged these projections (excluding unusually low and high projections) to derive *middle* projections. These middle projections were used as a 'control' total for projections prepared in Section III. In Section III of this report, we projected Newtown population by *age and by sex*. After trying several methods, we found the share-ratio method was the most satisfactory projection method.

1.6 Population Projection Methods

The Share-Ratio Method (SRM) derives the population of a town from projections for large-area populations (e.g., state populations). In this method, we projected Newtown's population by multiplying the U.S. Census Bureau's projections of Connecticut's total population by the projected Newtown's shares of Connecticut's populations.*

* Table A1: Interim Projections of the Total Population for the United States and States: April, 2000 to July 1, 2030
U. S. Census Bureau, Population Division, Interim State Population Projections, 2005, Interim Release Date: April 21, 2005. File 4. Interim State Projections of Population by Single Year of Age and Sex: July 1, 2004 to 2030 is also available.

2. TOTAL POPULATION PROJECTIONS

2.1 Introduction

Our aim is to forecast Newtown’s population *by age and by sex*. But before we can accomplish this task, we want to identify the most likely or probable *total* population figures for Newtown over the next twenty-five years, between 2005 and 2030. Unfortunately, there is no single method that can be deemed *a priori* to produce the most probable projections. Thus, to the extent that the data necessary for calculations were available, we tried a number of different methods.

2.2 Total Population Projection by the Share Ratio Method

This is the simplest method for projecting the total population of a town since the U. S. Census Bureau has already projected the total Connecticut population. First, we calculated the historical trends since 1900 for the town’s populations as shares (in percent) of Connecticut’s total population (column 3) to derive the percentage changes in Newtown's shares (column 4). These calculations are shown in Table 2.1 and illustrated in Figure 2-1.

TABLE 2.1
PROJECTION OF TOTAL NEWTOWN POPULATION APPLYING
NEWTOWN’S SHARE (%) OF CONNECTICUT’S POPULATION

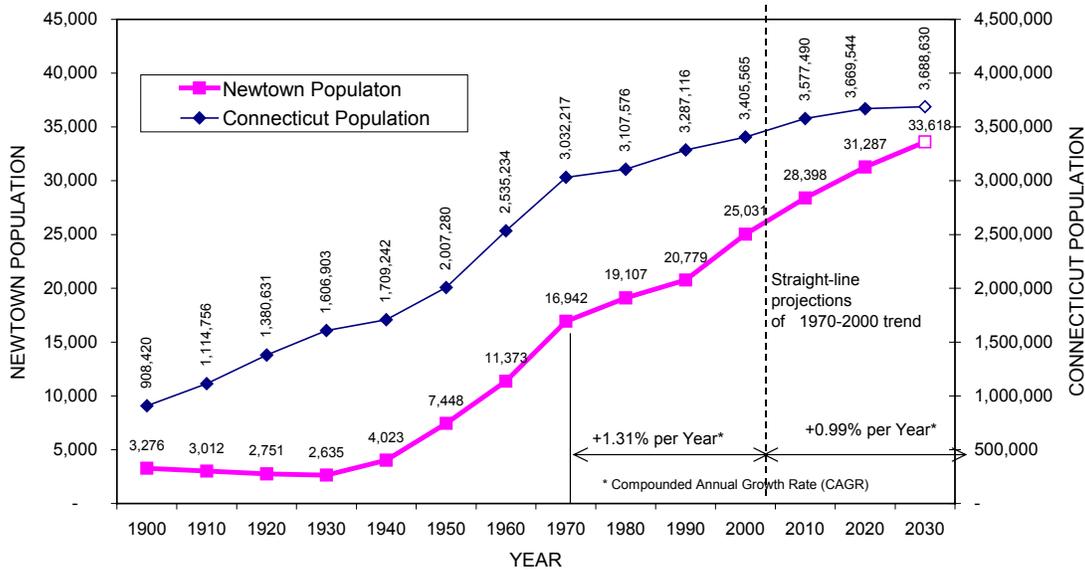
	Connecticut Population (1)	30-Yr. Avg. Growth Rate Projections*			20-Yr. Avg. Rate Proj.		10-Yr. Avg. Rate Proj	
		Newtown Population (2)	Newtown's Share of CT Pop. (3)	Changes in Newtown's Share (4)	Newtown Population (5)	Newtown's Share of CT Pop. (6)	Newtown Population (7)	Newtown's Share of CT Pop. (8)
1900	908,420	3,276	0.3606%		3,276	0.361%	3,276	0.361%
1910	1,114,756	3,012	0.2702%	-0.09%	3,012	0.270%	3,012	0.270%
1920	1,380,631	2,751	0.1993%	-0.0709%	2,751	0.199%	2,751	0.199%
1930	1,606,903	2,635	0.1640%	-0.0353%	2,635	0.164%	2,635	0.164%
1940	1,709,242	4,023	0.2354%	0.0714%	4,023	0.235%	4,023	0.235%
1950	2,007,280	7,448	0.3710%	0.1357%	7,448	0.371%	7,448	0.371%
1960	2,535,234	11,373	0.4486%	0.0775%	11,373	0.449%	11,373	0.449%
1970	3,032,217	16,942	0.5587%	0.1101%	16,942	0.559%	16,942	0.559%
1980	3,107,576	19,107	0.6149%	0.0561%	19,107	0.615%	19,107	0.615%
1990	3,287,116	20,779	0.6321%	0.0173%	20,779	0.632%	20,779	0.632%
2000	3,405,565	25,031	0.7350%	0.1029%	25,031	0.735%	25,031	0.735%
2005	3,405,565	26,966	0.7918%	0.0568%	26,966	0.792%	26,966	0.792%
2010	3,503,185	28,398	0.7938%	0.0294%	27,852	0.795%	29,352	0.838%
2015	3,577,490	29,927	0.8232%	0.0294%	29,517	0.825%	31,815	0.889%
2020	3,635,414	31,287	0.8526%	0.0294%	31,086	0.855%	34,200	0.941%
2025	3,669,544	32,555	0.8820%	0.0294%	32,480	0.885%	36,408	0.992%
2030	3,691,016	33,618	0.9114%	0.0294%	33,778	0.915%	38,520	1.044%

Source: (1) projections by the U. S. Census Bureau; (2), (5) and (7) projections by HCPC, Inc.; Col. (3) = (2) / (1). * Average of three decades between 1970 and 2000.

Note the decline of Newtown’s share of Connecticut’s population between 1900 and 1930 (columns 3 and 4) because Connecticut’s population was growing moderately fast while Newtown’s population was growing very slowly. On the other hand, between 1940 and 1970, Newtown’s share of Connecticut’s population increased rapidly, indicating that Newtown’s

population grew much faster than that of Connecticut. The relatively fastest growth took place between 1940 and 1950, resulting in Newtown's share of Connecticut's population increasing by 0.1357% in a decade.

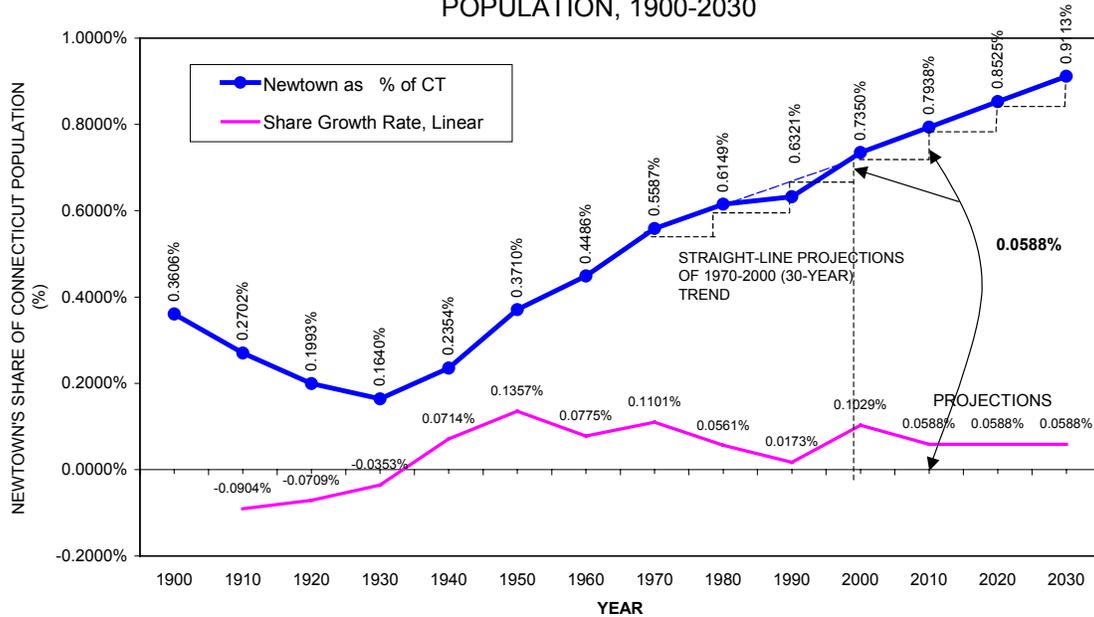
FIG. 2-1
CONNECTICUT AND NEWTOWN POPULATION GROWTH HISTORY (1900-2000) AND PROJECTIONS (2000-2030)



Historically, Newtown's share of Connecticut population increased from a low of 0.164% in 1930 to a high of 0.792% in 2005 as shown in Figure 2-2. It may well be that Newtown's share of Connecticut's population will increase even more. In order to project Newtown's share of Connecticut's population, we assumed that this share would increase at the constant rate of 0.0588% per decade or 0.0294% every five years, which is the average increase in Newtown's share as recorded during the past thirty years, or between 1970 and 2000 (see Figure 2-2 below). At this rate, Newtown's share will be 0.9111% by the year 2030. Once Newtown's share of Connecticut's population was estimated, we multiplied this percentage to projections of Connecticut's population to derive Newtown's population. Accordingly, the total population of Newtown in 2030 was projected to be 33,638 persons. These projections of Newtown's total population thus imply that the population of Newtown will increase slightly faster than that of Connecticut over the next 25 years as illustrated in Figure 2-1. As shown in Table 2.1, the application of the 20-year average growth rate (0.060% per decade) for Newtown's share of Connecticut's population produced a population size of 33,778 persons that was slightly higher than the populations projected by the application of the 30-year rate (0.0588% per decade). In contrast, the application of the 10-year growth rate (1.029% per decade) produced a very large

population estimate of 38,520 persons in 2030. In sum, 20- and 30-year growth trends produced more or less the same low population projections while the 10-year growth trend produced very high projections.

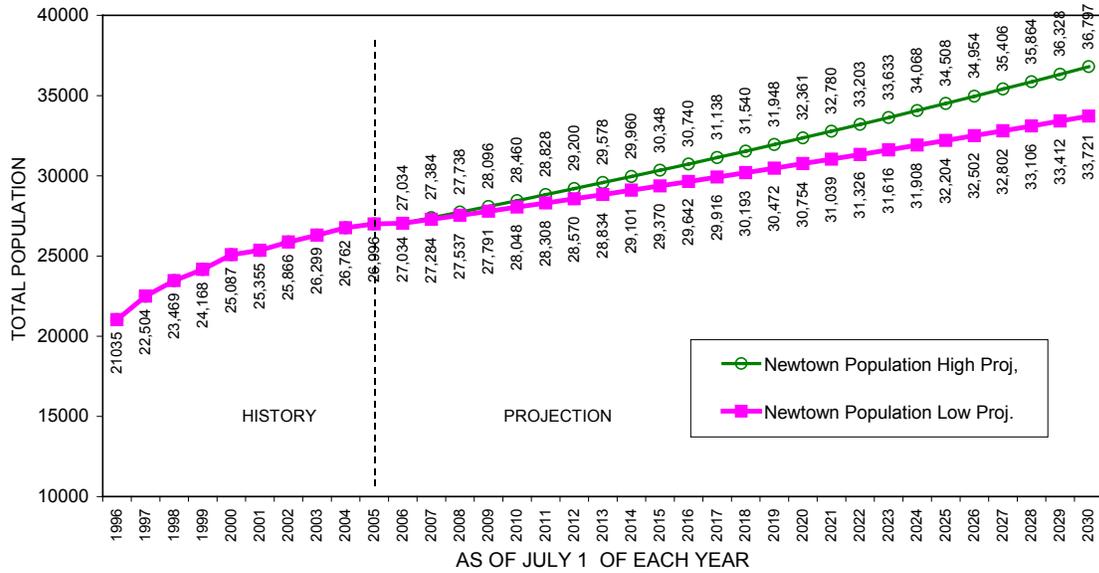
FIG. 2-2
CHANGING PATTERNS OF NEWTOWN'S SHARE OF CONNECTICUT'S
POPULATION, 1900-2030



2.3 Total Population Projections by Extrapolating Past Annual Growth Rates

The report's second projection method applies *annual* population growth rates to forecast the town's annual population. As shown in Table 2.2, first, we calculated the average annual growth rate for the last ten years between 1997 and 2006, based on the annual town populations estimated by the Connecticut Department of Public Health. Observe that the annual growth rate for Newtown's population has been diminishing during the past decade: the Newtown population grew by 6.98% in 1997, but declined to 4.29% in the following year and sharply declined further to 0.87% in 2005 and 0.14% in 2006. Thus, it is reasonable to assume that the total population of Newtown has been growing at an annually declining rate. Accordingly, we adopted a 3-year (2004-2006) annual average growth rate of 0.925% and a 5-year (2002-2006) average annual growth rate of 1.293%. We then assumed these rates would remain constant and projected two sets of annual populations for Newtown over the next 25 years up to the year 2030. The application of the constant growth rates resulted in straight-line projections as shown in Figure 2-3. Obviously, the low 3-year average annual rate produced low total population projections, and the relatively high 5-year annual rate produced high population projections.

FIG. 2-3
 NEWTOWN LINEAR POPULATION PROJECTIONS
 LOW AND HIGH PROJECTIONS, 2006-2030



As we observe in Table 2.2 on the next page and in Figure 2-3 above, the application of the 0.925% annual growth rate throughout the projection years resulted in a relatively low projected population of 33,721 persons in 2030. On other hand, the application of the 1.293% annual rate produced a high projected population of 36,797 persons.

Also note that the straight-line low projections shown in Table 2.2 are quite similar to the share-ratio low projections prepared earlier in Table 2.1. On the other hand, the 5-year annual rate high projections are roughly 5% lower than the high projections produced by the application of the high growth rate exhibited between 1990 and 2000, as shown in Table 2.1.

* The unusually high population growth rate of 1990s was propelled by maturing baby boomers in the 1980s and 1990s leading to increasing number of childbearing age females and resultant increase in the number of school-age children in the 1980s and 1990s. The cumulative effects on the growing number of school-age children boosted the population size in Newtown. With the peaking of females aged 15 to 49 in the 1990s, the number of childbearing age females began to decrease and so did the number of school children since 2000.

NEWTOWN POPULATION PROJECTIONS

TABLE 2.2
PROJECTION OF ANNUAL NEWTOWN POPULATION APPLYING AN
ANNUAL GROWTH RATE, 2006 - 2030

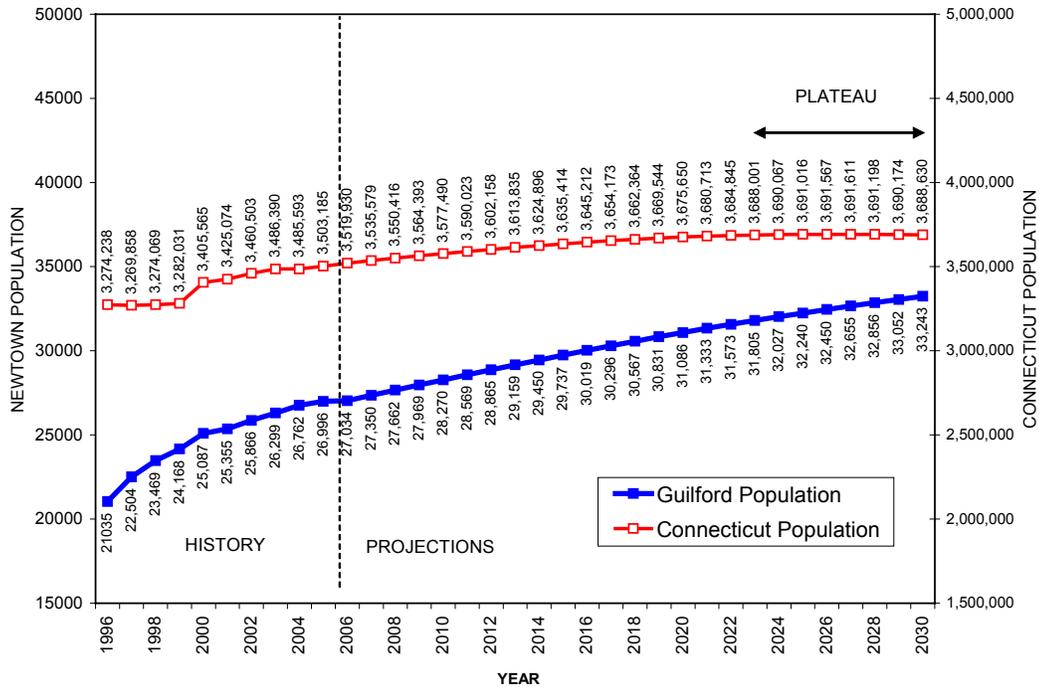
As of July 1	Low (2004-2006 Avg. Growth Rate) Projections			High (2002-2006 Avg. Growth Rate) Projections		
	Newtown Population Low Proj. (3-Yr. Avg.)	Annual Change Number	Annual Growth Rate Percent	Newtown Population High Proj. 5-Yr. Avg.	Annual Change Number	Annual Growth Rate Percent
1996	21035			21035		
1997	22,504	1,469	6.98%	22,504	1,469	6.98%
1998	23,469	965	4.29%	23,469	965	4.29%
1999	24,168	699	2.98%	24,168	699	2.98%
2000	25,087	919	3.80%	25,087	919	3.80%
2001	25,355	268	1.07%	25,355	268	1.07%
2002	25,866	511	2.02%	25,866	511	2.02%
2003	26,299	433	1.67%	26,299	433	1.67%
2004	26,762	463	1.76%	26,762	463	1.76%
2005	26,996	234	0.87%	26,996	234	0.87%
2006	27,034	38	0.14%	27,034	38	0.14%
2007	27,284	250	0.925%	27,384	350	1.293%
2008	27,537	252	0.925%	27,738	354	1.293%
2009	27,791	255	0.925%	28,096	359	1.293%
2010	28,048	257	0.925%	28,460	363	1.293%
2011	28,308	260	0.925%	28,828	368	1.293%
2012	28,570	262	0.925%	29,200	373	1.293%
2013	28,834	264	0.925%	29,578	378	1.293%
2014	29,101	267	0.925%	29,960	382	1.293%
2015	29,370	269	0.925%	30,348	387	1.293%
2016	29,642	272	0.925%	30,740	392	1.293%
2017	29,916	274	0.925%	31,138	397	1.293%
2018	30,193	277	0.925%	31,540	403	1.293%
2019	30,472	279	0.925%	31,948	408	1.293%
2020	30,754	282	0.925%	32,361	413	1.293%
2021	31,039	285	0.925%	32,780	418	1.293%
2022	31,326	287	0.925%	33,203	424	1.293%
2023	31,616	290	0.925%	33,633	429	1.293%
2024	31,908	293	0.925%	34,068	435	1.293%
2025	32,204	295	0.925%	34,508	440	1.293%
2026	32,502	298	0.925%	34,954	446	1.293%
2027	32,802	301	0.925%	35,406	452	1.293%
2028	33,106	303	0.925%	35,864	458	1.293%
2029	33,412	306	0.925%	36,328	464	1.293%
2030	33,721	309	0.925%	36,797	470	1.293%

Source: Newtown Population from the Connecticut State Department of Public Health.

2.4 Total Population Projections By Applying Newtown’s Share of Connecticut’s Population

This method is a variation of the share ratio method we used in Section 2.2. In the earlier application, we used long-term growth rates over 10-, 20-, and 30-years for Newtown’s share of Connecticut’s population and projected the population at five-year intervals. In contrast, in this report we applied a short-term growth rate. First, we calculated a 5-year average growth rate for Newton’s share of Connecticut’s populations between 2001 and 2005, and then projected Newtown’s shares of Connecticut populations over the next 25 years assuming that the 5-year average annual growth rate of 0.0056% remains constant throughout the 25-year projection period (see column 5 of Table 2.3). Thus, Newtown’s share is projected to increase from 0.768% in 2006 to 0.774% in the following year 2007 and ultimately to 0.901% in 2030. Since we assumed a constant increment in the share of Connecticut’s population, the Newtown population projections are also linear or straight-line. In the year 2030, Newtown’s share of Connecticut’s population is estimated to be 0.901%* to produce a projected population of 33,243 persons, slightly less than the population projected by the Share Ratio Method presented in Section 2.1.

**FIG. 2-4
PROJECTION OF NEWTOWN POPULATIONS BASED ON
THE PROJECTED CONNECTICUT POPULATIONS, 2005-2030**



* In Table 2.1, Newtown's share of Connecticut's projected population in 2030 was estimated to be 0.911%.

TABLE 2.3
ANNUAL POPULATION PROJECTONS APPLYING
NEWTOWN'S SHARE OF CONNECTICUT'S PROJECTED POPULATION
2005-2030

	Connecticut Population (1)	Conn. Population Annual Change (2)	Connecticut Population Annual % Change (3)	Newtown Population (4)	Newtown's Share of Conn. Population (5)	Annual Changes in Newtown's Share (6)
<u>HISTORY:</u>						
1996	3,274,238			21035	0.642%	
1997	3,269,858	(4,380)	-0.134%	22,504	0.688%	0.0458%
1998	3,274,069	4,211	0.129%	23,469	0.717%	0.0286%
1999	3,282,031	7,962	0.243%	24,168	0.736%	0.0196%
2000	3,405,565	123,534	3.764%	25,087	0.737%	0.0003%
2001	3,425,074	19,509	0.573%	25,355	0.740%	0.0036%
2002	3,460,503	35,429	1.034%	25,866	0.747%	0.0072%
2003	3,486,390	25,887	0.748%	26,299	0.754%	0.0069%
2004	3,485,593	(797)	-0.023%	26,762	0.768%	0.0135%
2005	3,503,185	17,592	0.505%	26,996	0.771%	0.0028%
2006	3,519,930	16,745	0.478%	27,034	0.768%	-0.0026%
<u>PROJECTIONS:</u>						
2007	3,535,579	15,649	0.445%	27,350	0.774%	0.0056%#
2008	3,550,416	14,837	0.420%	27,662	0.779%	0.0056%
2009	3,564,393	13,977	0.394%	27,969	0.785%	0.0056%
2010	3,577,490	13,097	0.367%	28,270	0.790%	0.0056%
2011	3,590,023	12,533	0.350%	28,569	0.796%	0.0056%
2012	3,602,158	12,135	0.338%	28,865	0.801%	0.0056%
2013	3,613,835	11,677	0.324%	29,159	0.807%	0.0056%
2014	3,624,896	11,061	0.306%	29,450	0.812%	0.0056%
2015	3,635,414	10,518	0.290%	29,737	0.818%	0.0056%
2016	3,645,212	9,798	0.270%	30,019	0.824%	0.0056%
2017	3,654,173	8,961	0.246%	30,296	0.829%	0.0056%
2018	3,662,364	8,191	0.224%	30,567	0.835%	0.0056%
2019	3,669,544	7,180	0.196%	30,831	0.840%	0.0056%
2020	3,675,650	6,106	0.166%	31,086	0.846%	0.0056%
2021	3,680,713	5,063	0.138%	31,333	0.851%	0.0056%
2022	3,684,845	4,132	0.112%	31,573	0.857%	0.0056%
2023	3,688,001	3,156	0.086%	31,805	0.862%	0.0056%
2024	3,690,067	2,066	0.056%	32,027	0.868%	0.0056%
2025	3,691,016	949	0.026%	32,240	0.873%	0.0056%
2026	3,691,567	551	0.015%	32,450	0.879%	0.0056%
2027	3,691,611	44	0.001%	32,655	0.885%	0.0056%
2028	3,691,198	(413)	-0.011%	32,856	0.890%	0.0056%
2029	3,690,174	(1,024)	-0.028%	33,052	0.896%	0.0056%
2030	3,688,630	(1,544)	-0.042%	33,243	0.901%	0.0056%

*These figures represent the acceleration or deceleration of annual changes in Newtown's shares of Connecticut's populations. **Nine-year average rate of annual share (in %) changes. # 2001-2006 five-year average

2.5 Multiple Regression Analysis Projections

It is reasonable to think that the population growth of a town is closely related to the number of dwelling units added each year and/or to the total number of housing units in the town.

Furthermore, it is likely that this population growth may be negatively impacted by the statewide unemployment rate or the town's unemployment rate. This common sense expectation is born out by the following equation:

$$[2.1] \quad \text{TOTPOP}(t) = 9.006587 \text{ NETDU}(-7) + 2.792 \text{ TOTHU}(t) - 366.113 \text{ UNM}(-4) \quad [1990-2006]$$

(4.53)
(40.70)
(-3.61)

R-Squared = 0.984
S. E. E. = 224.00
D.W. = 1.57
MDV =25,354.0

Where TOTPOP(t) denotes the total population of Newtown in the year t; NETDU (-7) represents the net number of new dwelling units built in seven years prior to the year t or t-7; TOTHU(t) is the number of total housing units or inventory in the town in the year t; and UNM(-4) is the unemployment rate of Newtown four years prior to year t or t-4. Note that the new housing units would have a significant impact seven years after their construction. This time-lag effect is expected because according to the Family Cycle Model*, the number of school children (also, the household size) is expected to increase after young families move into new homes and have the maximum number of children by 7 to 12 years after their move. It is also expected that high unemployment rates tend to generate a low level of new housing construction and deter home sales as well, affecting the population's movements. As shown in Figure 2-5 on the next page, the number of housing units in a town is very significantly (see the very large size of the t ratios) related to the total population, that is, each housing unit adds 2.792 persons to the town's population size. Note that the coefficient 2.772 persons is the average number of persons per housing unit in Newtown, adjusted by the impacts of unemployment rates and the annual housing gains.

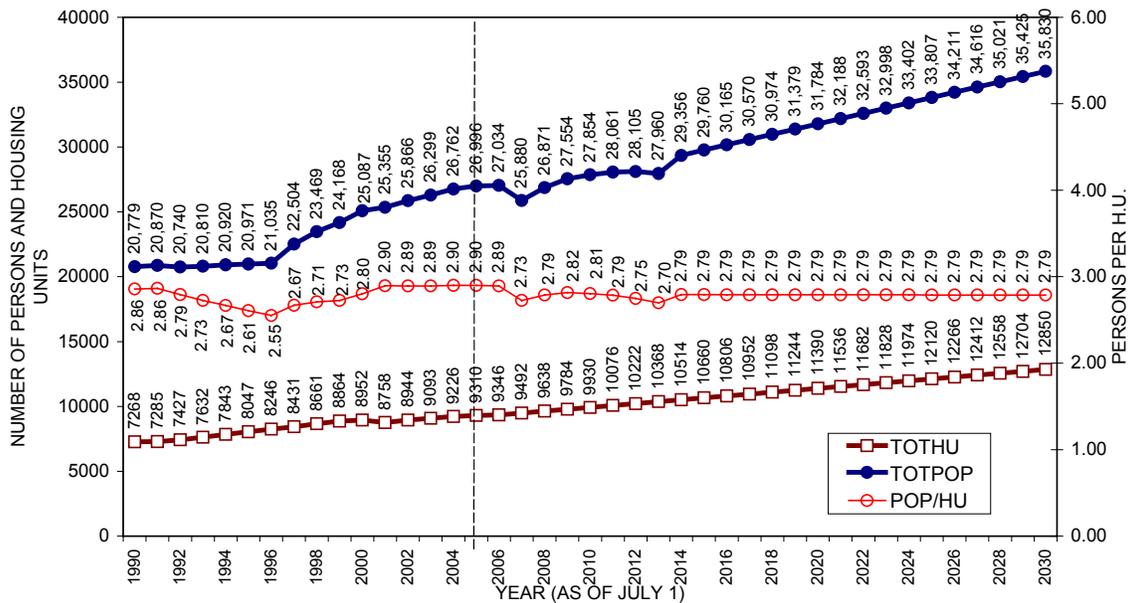
The use of equation 2.1 for population projections required making assumptions about the future values for TOTHU, DU, NETDUE and UNM. We assumed that on average: 155 new units (DU) would be built per year, but the total number of housing units (TOTHU) would increase by 146 units per year because NETDU, the net housing gain or addition, is assumed to be 146 units per year.** It is also assumed that Newtown's unemployment rates would be a constant 3.0% over the next twenty five years. (There is no way to know ahead of time the extent of cyclical fluctuations of unemployment rates in the future.)

*For an explanation of the Family Cycle Model, see the report, *New Milford Public School Enrollment Dynamics and Projections, 1998-2017*, prepared by H. C. Planning Consultants, Inc.

** The housing stock size in a town does not increase by the number of new housing units built per year because many units are also demolished for various reasons such as fire and are converted to other uses. Accordingly, net gains are normally smaller than the number of new dwelling units built each year.

As shown in Table 2.4 and Figure 2.5, the multiple regression method resulted in the projected population of 35,830 persons in 2030. Note also that the Newtown population projections resulted in a constant 2.79 persons per housing unit over the next 25 years. However, it is likely that actual average number of persons per housing unit will become smaller than 2.79 due to the anticipated increase in the elderly population and single-person household. *Accordingly, the projected population size of 35,830 for 2030 may be too high. We believe that any population projection higher than 36,000 persons may be too high because the population multiplier per housing unit (or household size) seems to be declining.**

FIG. 2-5
ANNUAL POPULATION PROJECTIONS BY THE MULTIPLE REGRESSION METHOD, NEWTOWN, CONNECTICUT, 2005-2030



* This conclusion is based solely on the historical demographic trend analyses of Newtown and disregards the 'buildout' housing capacity or the maximum number of housing units to be built on all the residentially zoned vacant land in the town. See Section 2.9 on page 2-15.

TABLE 2.4
ANNUAL POPULATION PROJECTIONS BY MULTIPLE REGRESSION METHOD
NEWTOWN, CONNECTICUT, 2005-2030

	Annual Housing Units Built (DU)	Net Gain of Housing Units (NETDU)	Newtown Total Housing Units (TOTHU)	Newtown Unemp. Rate (UNM)	Newtown Pop. (As of July 1) (TOTPOP)	POP/H.U.
<u>HISTORY:</u>						
1990	69	64	7,268	3.5	20,779	2.859
1991	92	91	7,285	4.6	20,870	2.865
1992	143	142	7,427	5.4	20,740	2.793
1993	207	205	7,632	4.5	20,810	2.727
1994	213	211	7,843	3.8	20,920	2.667
1995	210	209	8,047	3.7	20,971	2.606
1996	199	199	8,246	3.6	21,035	2.551
1997	195	185	8,431	2.8	22,504	2.669
1998	238	238	8,661	2.1	23,469	2.710
1999	221	221	8,864	2.0	24,168	2.727
2000	103	103	8,952	1.4	25,087	2.802
2001	164	164	8,758	2.5	25,355	2.895
2002	195	195	8,944	3.2	25,866	2.892
2003	159	135	9,093	3.7	26,299	2.892
2004	137	113	9,226	3.6	26,762	2.901
2005	97	65	9,310	3.6	26,996	2.900
2006	36	36	9,346	3.0	27,034	2.893
<u>PROJECTIONS:</u>						
2007	155*	146*	9,492	3.0	25,880	2.73
2008	155	146	9,638	3.0	26,871	2.79
2009	155	146	9,784	3.0	27,554	2.82
2010	155	146	9,930	3.0	27,854	2.81
2011	155	146	10,076	3.0	28,061	2.79
2012	155	146	10,222	3.0	28,105	2.75
2013	155	146	10,368	3.0	27,960	2.70
2014	155	146	10,514	3.0	29,356	2.79
2015	155	146	10,660	3.0	29,760	2.79
2016	155	146	10,806	3.0	30,165	2.79
2017	155	146	10,952	3.0	30,570	2.79
2018	155	146	11,098	3.0	30,974	2.79
2019	155	146	11,244	3.0	31,379	2.79
2020	155	146	11,390	3.0	31,784	2.79
2021	155	146	11,536	3.0	32,188	2.79
2022	155	146	11,682	3.0	32,593	2.79
2023	155	146	11,828	3.0	32,998	2.79
2024	155	146	11,974	3.0	33,402	2.79
2025	155	146	12,120	3.0	33,807	2.79
2026	155	146	12,266	3.0	34,211	2.79
2027	155	146	12,412	3.0	34,616	2.79
2028	155	146	12,558	3.0	35,021	2.79
2029	155	146	12,704	3.0	35,425	2.79
2030	155	146	12,850	3.0	35,830	2.79

* There were 34 housing permits issued in 2007 according to the Newtown Building Department. This table was prepared November, 2007. *10-year (1997-2006) averages.

2.6 Growth Component Method Projections

The population growth in an area is made up of essentially two components, natural increase and net migration. Therefore the future population can be calculated as follows:

$$[2.2] \quad P_f = P_p + (B - D) + (M_i - M_o)$$

where P_f = future population

P_p = present population

B = number of births

D = number of deaths

M_i = number *migrating in*

M_o = number *migrating out*

The results of applying this basic equation to the past populations in Newtown are shown in Table 2.5 on the next page and they were calculated using the following assumptions:

Crude Birth Rate: it is assumed that the crude birth rate (number of births per 1000 persons) will gradually increase from 10.2 births in 2005 to 12.3 births in 2015, and will remain more or less at that level for another five years. It will then decline to 9.0 births per 1,000 persons in 2030 as the number of childbearing age females decline and the number and percent of elderly population increase very rapidly during the projection period.

Crude Mortality Rate: It is also anticipated that the crude death rates will increase as the number and percent of elderly population increase due to the increasing number of aging baby boomers.

Natural Increase: The net results of the decreasing crude birth rates and increasing crude death rates will result in a smaller natural population growth in the future.

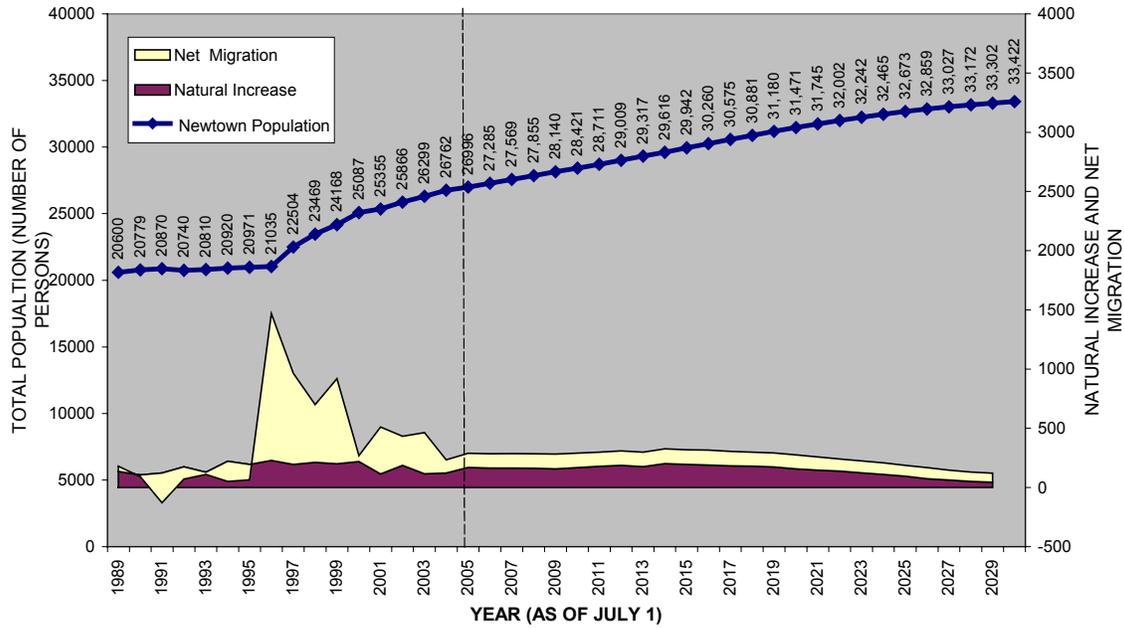
Net Migration: The lower births and increasing deaths are assumed to be a statewide phenomenon. Accordingly, there will be a smaller pool of individuals available to migrate into Newtown.

After applying these assumptions, the component method yielded a projected population size of 33,422 persons in 2030. *It must be noted that the numbers of births and net migration will fluctuate considerably from year to year in response to actual economic conditions prevailing in the future. Thus, the annual population growth trends of a town will most likely fluctuate from year to year (see for example the considerable fluctuation in net migration of population between 1989 and 2005).*

TABLE 2.5
TOTAL POPULATION OF NEWTOWN PROJECTED
BY GROWTH COMPONENT METHOD
2006 – 2030

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Newtown Population	Live Births	Crude Birth Rate	Number Of Deaths	Crude Death Rate	Annual Pop. Change	Annual % Change	Natural Increase	Natural Increase Rate	Net Migration Rate	Net Mig. Rate
HISTORY:											
1989	20600										
1990	20779	252	12.1	116	5.6	179	8.7	136	6.6	43	2.1
1991	20870	258	12.4	151	7.2	91	4.4	107	5.1	-16	(0.8)
1992	20740	245	11.8	124	6.1	-130	(6.2)	121	5.8	-251	(12.0)
1993	20810	299	14.4	125	6.1	70	3.4	174	8.4	-104	(5.0)
1994	20920	245	11.8	117	5.7	110	5.3	151	7.3	-41	(2.0)
1995	20971	350	16.7	128	6.1	51	2.4	222	10.6	-171	(8.2)
1996	21035	332	15.8	137	6.5	64	3.1	195	9.3	-131	(6.2)
1997	22504	372	16.5	144	6.4	1469	69.8	228	10.8	1241	59.0
1998	23469	333	14.2	139	7	965	42.9	194	8.6	771	34.3
1999	24168	344	14.5	133	5.5	699	29.8	211	9.0	488	20.8
2000	25087	346	13.8	146	5.8	919	38.0	200	8.3	719	29.8
2001	25355	349	13.8	131	5.2	268	10.7	218	8.7	50	2.0
2002	25866	278	10.7	164	6.3	511	20.2	114	4.5	397	15.7
2003	26299	337	12.7	150	5.7	433	16.7	187	7.2	246	9.5
2004	26762	276	10.3	161	6	463	17.6	115	4.4	348	13.2
2005	26996	275	10.2	153	6.9	234	8.7	122	4.6	112	4.2
PROJECTIONS:											
2006	27,285	324	12	154	5.7	289	10.7	170	6.3	119	4.4
2007	27,569	322	11.8	158	5.8	284	10.4	164	6.0	120	4.4
2008	27,855	328	11.9	163	5.9	286	10.4	165	6.0	121	4.4
2009	28,140	326	11.7	164	5.9	285	10.2	162	5.8	123	4.4
2010	28,421	324	11.5	166	5.9	281	10.0	158	5.6	123	4.4
2011	28,711	335	11.8	168	5.9	290	10.2	167	5.9	123	4.3
2012	29,009	339	11.8	161	5.6	298	10.4	178	6.2	120	4.2
2013	29,317	348	12	162	5.6	308	10.6	186	6.4	122	4.2
2014	29,616	340	11.6	164	5.6	299	10.2	176	6.0	123	4.2
2015	29,942	364	12.3	163	5.5	326	11.0	201	6.8	125	4.2
2016	30,260	363	12.1	168	5.6	318	10.6	195	6.5	123	4.1
2017	30,575	366	12.1	176	5.8	315	10.4	190	6.3	125	4.1
2018	30,881	373	12.2	190	6.2	306	10.0	183	6.0	123	4.0
2019	31,180	371	12	191	6.2	299	9.7	180	5.8	119	3.9
2020	31,471	368	11.8	196	6.3	291	9.3	172	5.5	119	3.8
2021	31,745	362	11.5	205	6.5	274	8.7	157	5.0	117	3.7
2022	32,002	356	11.2	210	6.6	257	8.1	146	4.6	111	3.5
2023	32,242	352	11	214	6.7	240	7.5	138	4.3	102	3.2
2024	32,465	339	10.5	216	6.7	223	6.9	123	3.8	100	3.1
2025	32,673	328	10.1	218	6.7	208	6.4	110	3.4	98	3.0
2026	32,859	317	9.7	222	6.8	186	5.7	95	2.9	91	2.8
2027	33,027	302	9.2	227	6.9	168	5.1	75	2.3	93	2.8
2028	33,172	294	8.9	231	7.0	145	4.4	63	1.9	82	2.5
2029	33,302	289	8.7	239	7.2	130	3.9	50	1.5	80	2.4
2030	33,422	283	9.0	240	7.0	120	4.0	43	1.3	77	2.0
2001-2005:											
5-Yr Avg.	26,256	303	11.5	152	6.0	382	14.8	151	5.9	231	8.9
3-Yr. Avg.	26,686	296	11.1	155	6.2	377	14.4	141	5.4	235	9.0

FIG. 2-5
NEWTOWN POPULATION PROJECTIONS BY COMPONENT METHOD
2006-2030



2.7 Summary and Conclusions

Table 2.6 on the next page summarizes each of the five projections derived by employing a different method and projecting past trends. The sixth row of the table shows the averages of the five population projections, which are less than 36,000 persons in 2030. Note that the year 2030 population is calculated to be 33,999 persons.

The middle projections show that Newtown’s population increased by 1,965 persons or by 7.9% in five years between 2000 and 2005. The 2005 inter-census population was estimated by the Connecticut State Department of Public Health. According to the middle projections, it is projected that Newtown will add 7,003 persons (roughly 7,000 persons) between 2005 and 2030, or approximately 280 persons per year. Assuming 2.79 persons per housing unit, an annual gain of 280 persons is equivalent to a net addition of approximately 100 housing units per year.

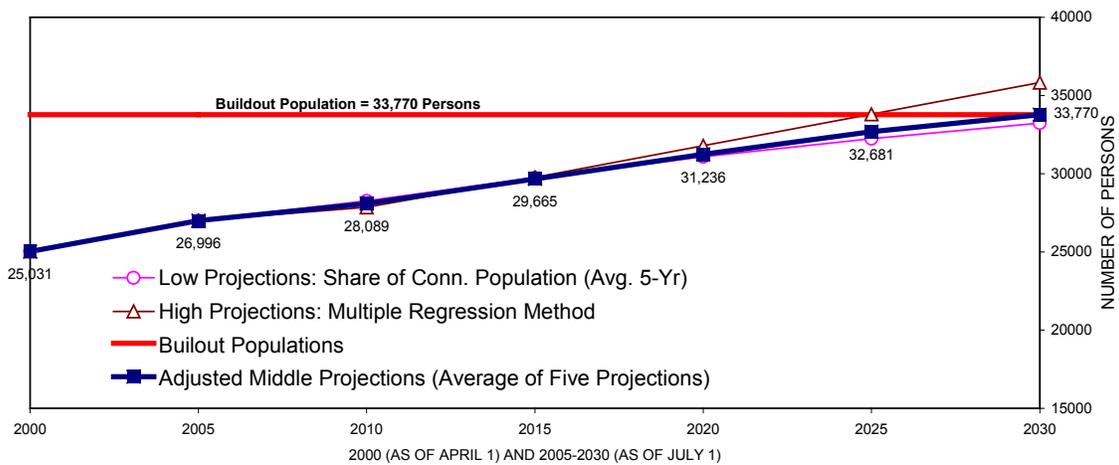
NEWTOWN POPULATION PROJECTIONS

TABLE 2.6
SUMMARY OF TOTAL POPULATION PROJECTIONS
BY VARIOUS METHODS
NEWTOWN, CONNECTICUT, 2005-2030

	April 1, 2000	July 1 2005	July 1 2010	July 1 2015	July 1 2020	July 1 2025	July 1 2030
Share Ratio Method (20-Yr Trend)	25,031	26,996	27,852	29,517	31,086	32,480	33,778
Annual Growth Rate (3-Yr. Avg. Rate)	25,031	26,996	28,048	29,370	30,754	32,204	33,721
<u>Low Projections: Share of CT. Populations</u> (5-Year Average Rate)	25,031	26,996	28,270	29,737	31,086	32,240	33,243
<u>High Projections: Multiple Regression</u> (16-year Trend)	25,031	26,996	27,854	29,760	31,784	33,807	35,830
Component Method	25,031	26,996	28,421	29,942	31,471	32,673	33,422
Middle Projections (Avg. of Five Proj.)	25,031	26,996	28,089	29,665	31,236	32,681	33,999
<u>Population Change:</u>							
5-Year Population Change		1,965	1,093	1,576	1,571	1,445	1,318
Population per Year		393	219	315	314	289	264
<u>Change in Housing Stock</u>							
5-Year Housing Unit Changes		704	392	565	563	518	472
Housing Unit Change per Year		141	78	113	113	104	94
Adjusted Middle Projections	25,031	26,996	28,089	29,665	31,236	32,681	33,770*
<u>Population Change:</u>							
5-Year Population Change		1,965	1,093	1,576	1,571	1,445	1,254
Population per Year		393	219	315	314	289	251
<u>Changes in Housing Stock:</u>							
5-Year Housing Unit Change		704	392	565	563	518	450
Housing Unit per Year		141	78	113	113	104	90

*Adjusted to match the buildout population.

FIG. 2-7
PROJECTED AND BUILDOUT POPULATIONS
NEWTOWN, CT, 2000-2030



2.8 Newtown Build-out Capacity

The population forecasts shown in Table 2-6 were prepared by projecting various past population growth trends which *assume that there is an ample supply of developable land remaining in Newtown*. But, are there enough developable lands in Newtown which could accommodate the projected populations? Also, would the diminishing residential land supply curtail or slow down the housing and population growth trends in the future?

According to its buildout study, Planimetrics calculated that 2,435 new housing units could be built on the residentially zoned lands remaining in Newtown. This implies that the buildout (or holding /saturation) capacity of Newtown would be 12,104 dwelling units, adding 2,435 new units to the existing housing stock of 9,669 units as of March 2008.* Assuming an average population multiplier of 2.79 persons per housing unit, the buildout population is calculated to be 33,770 persons. Note that the buildout population size turned out to be almost identical to (229 persons or 0.7% less than) the projected population of 33,999 persons in 2030, the middle projections which were estimated by averaging the five population projections shown in Table 2-6 above. Therefore, we have adjusted the middle projections slightly downward to match the buildout population size.** In sum, there is a sufficient amount of residentially zoned developable land to accommodate the buildout population size within the next 22 years between 2008 and 2030 (or the 25 years between 2005 and 2030).

The low and high projections for past population trends and the buildout population are compared in Figure 2-6 on the previous page. Note that if Newtown grows as indicated in the high projections, Newtown's residentially zoned land will be completely developed by approximately 2025. The projected low populations are slightly smaller than the adjusted middle projections. In short, Newtown will most likely attain the population size of 33,770 persons by 2030 as shown in Table 2-6 and Figure 2-6.

* GIS counts by Planimetrics.

** It is possible that the buildout population could be reached somewhat later than 2030 (e.g., 2035) because according to the theory of logistic curve growth, population growth rates tend to slow down as the population size approaches the growth limit of a town. It is well known that there is normally a limit to growth in natural phenomena, regardless of whether the growth is biological or physical, due to limitations created by various environmental factors. In the case of a town, it may be the buildout capacity of the town's land area, which defines a limit to growth assuming that zoning will not change in the future. As noted earlier, the projected populations could be lower because the population multipliers (average number of persons per housing unit) are likely to be smaller in later years as the number of elderly population increases.

3. POPULATION PROJECTIONS BY AGE AND SEX

3.1 Introduction

In this section, we present the Newtown population projections by age and sex, at five-year intervals. From the launch date of April 1, 2000, our population projections are presented at five-year intervals from 2005 to 2030, as of July 1st of each year.

3.2 Data Sources

The adoption of a population projection methodology is dictated by the extent to which relevant data are available. The following data are available for the population projections of the Town of Newtown:

- (1) The U. S. Censuses of Population for the years 1980, 1990, and 2000 provide Newtown's and Connecticut's populations by age and sex as well as by racial/ethnic groupings.
- (2) Connecticut's population estimates by age and sex for the inter-census years are available from the Connecticut Department of Public Health. Annual population estimates are available for the total population of Newtown, but not by age and sex.
- (3) Annual birth and death data for Connecticut and Newtown are reported in the annual Registration Report of the Connecticut State Department of Public Health. From these raw data we can calculate age-sex specific fertility and mortality rates for Connecticut, but similar birth and death rates cannot be calculated for Newtown because Newtown's population by age and sex are not available.
- (4) Annual population projections for the state of Connecticut by age and sex over the twenty-five years spanning 2005 through 2030 are available from the U.S. Census Bureau Population Division. These population projections were prepared in 2005.

3.3 Population Projection Methodologies

This report uses two approaches to prepare population projections for the Town of Newtown. The first approach is to derive Newtown's populations by age and sex *directly*, not based on the statewide population projections. The second approach is to project Newtown's populations based on the statewide population projections if they are already available and from reliable sources. It is also possible for the researchers to project the statewide projections first and then afterwards to project the local area populations.

In our projections, we *did not use* the following methods for various reasons. The most elaborate and theoretically sound method for projections is the Growth Component Method, which is based on the assumption that population growth can be defined as the sum of the natural population

increase (births minus deaths) and net migration (in- minus out-migration). This approach should hold true for all geographical areas. Accordingly, this method may be used both for statewide projections as well as for local area projections. The statewide population can be projected using this method because the necessary data such as age-sex specific birth, death and race/ethnic groupings, as well as annual population estimations, are available. The historical data also provide evidence of trends in these vital statistics so that the researchers can project future survival rates based on these past trends. The age-sex specific net migration data are usually estimated as the difference between the 'closed population' estimates and the known or enumerated population counts (i.e., U. S. Census of Population data).

While this data-intensive method can be applied relatively easily to the statewide projections, *this Growth Component Method is not readily adaptable to smaller local area population projections because of the limited amount of data available*. However, very often, local area population projections can be made by applying the statewide age-sex specific survival rates, assuming that the local area survival rates are not significantly different from the statewide survival rates. The local net migration figures can then be estimated by subtracting the 'closed populations' that were estimated by applying the statewide survival rates from the U. S. Census population. Clearly the shortcoming of this Growth Component Method is that the use of the statewide survival rates for local area projections is likely to produce significant cumulative projection errors because the racial/ethnic composition of the state as a whole compared to that of a local study area may be quite different. Furthermore, the assumption of *constant* survival rates and constant net-migration rates is untenable for each age-sex cohort over the next twenty to thirty years. At best, the method may be used to project only short-term and not long-term projections.

The Cohort Survival (Ratio) Method is similar to the Growth Component Method (GCM) but it is a much simpler method because it does not require survival rates and estimated net migration rates. Also, it must be noted that in the Cohort Survival Method (CSM), we use the term survival *ratios* instead of survival *rates*, which is used in the Growth Component Method. The survival rates in GCM represent the fraction of the age-sex specific cohort, which would survive (those who would not die) within a specified time interval as the group ages; accordingly, the survival rates are always less than one. On the other hand, the age-specific survival *ratios* used in the Cohort Survival Method (CSM) represent the extent of population growth or decline for age-sex specific cohorts. The ratio is measured in terms of the population size in the current year t divided by the population size in the n years after the year t or in the year $t+n$: i.e., P_{t+n} / P_t . As noted earlier, the population growth or decline in an area is the combined result of natural growth and net migration. For an under-5 year old cohort, the number of births, deaths and net migration are the three factors of growth or decline for this age group. However, for the cohorts aged 5 years and older, only two factors, mortality and net migration rates, determine population growth and decline.

* The survival rate is the converse of the mortality rate and denotes fractions of a given age-sex population cohort who survive (or do not die) within a year or any other specified time period.

In short, survival ratios *implicitly* represent the combined effects of both the mortality rate and net migration rate while the survival rates in the Cohort Component Method *explicitly* introduce mortality and net migration rates. As a result, survival ratios could be less than 1 when there is a zero net *out*-migration of population in addition to deaths; it could be equal to one if the net *in*-migration is equal to the number of deaths; and it could be greater than 1 when the net *in*-migration is greater than the number of deaths. These survival ratios are also called Hamilton-Perry Ratios*. The validity of this method was extensively discussed by Stanley K. Smith in his book, *State and Local Population Projections: Methodology and Analysis* (The Springer Series on Demographic Methods and Population Analysis).

To prepare population projections by the Cohort Survival Method, we do not need to obtain the data on death rates (mortality rates) and net migration rates. Thus, the data demand is minimal: all we need is the U.S. Census population data for the two past periods. In order to make CSM population projections, we obtained 1990 and 2000 population figures by age and sex, and then calculated the survival ratios for each age-sex cohort.

The shortcomings of this method are similar to those of the Cohort Component Method. This method could work well if the study area has a more or less constant rate of growth since the researchers have assumed that the age-sex cohort survival ratios will be constant throughout the projection period. Since the future population of Newtown is more likely to be affected by net migration rather than by natural increases (see Section 2, Table 2.5 on page 2-12), the changes in the growth patterns for the minority and elderly populations will have significant impact on the pattern of net migration. In short, this method may not be best suited for long-term population projections.

The Share-Ratio Method (SRM)

We applied both the Cohort Component Method and the Cohort Survival Method to produce population projections by age and sex for Newtown. Unfortunately, we found that these projection results were at odds with what could be logically expected. It appeared that the source of the projection errors was the assumption of constant age-sex specific net migration rates.

Dissatisfied with the Newtown population projections prepared by the Growth Component Method and Cohort Survival Method, we decided to use the Share-Ratio Method based on the statewide population projections by age and sex which the U.S. Census Bureau Population Division had prepared in 2005.** These projections were made for each year from 2005 through 2030. We have already introduced this method in projecting the total population of Newtown in Section II of this report. The projection procedure is briefly explained below.

* See C. H. Hamilton and Perry, "A Short Method for projecting population by age from one decennial census to another," *Social Forces*, 41, pp. 163-170.

** U. S. Census Bureau, Population Division, *Interim State Projections of Population for Five-Year Groups and Selected Age Group by Sex: 2004 to 2030*, issued in 2005.

The total population is divided into several age groups or cohorts. Each cohort is then subdivided into a male cohort and a female cohort. Usually, the age breakdown most frequently used is that adopted by the United States Census which divides the population by 5-year intervals up to the age of 84 with the last open-ended age group for those who are 85 years and older. There are therefore 18 age cohorts for males and another 18 age cohorts for females, making up 36 cohorts in all. Thus, for each age-sex cohort, we calculated the ratios representing Newtown's share of Connecticut's population for each age cohort as shown in Table 3.1. Accordingly, there are 36 share ratios calculated for each year. From the share ratios of the year 1990 and 2000, we derived the changes in the ratios during the ten-year period between 1990 and 2000. Although it is possible to assume that Newtown's share ratios are constant over the projection horizon, we projected the future years' share ratios by adding an annual increment of ratios experienced during the past ten years. We found that on average, Newtown's male shares increased by 0.0014% per year while Newtown's female shares increased by 0.0034% per year between 1990 and 2000.

Once Newtown's shares of Connecticut's population were projected, these projected ratios were multiplied to the statewide projections for each of the age-sex cohorts. Since annual Connecticut population projections are available for 2005 through 2030, we were able to project Newtown's populations by age and sex for each year over the next twenty-five years. We found that the total populations of Newtown were slightly higher than the 'control' total population we derived in Section II, and so we adjusted the SRM population projections so that they conformed to the control totals. The projections for five-year intervals are shown in Table 3.3.

NEWTOWN POPULATION PROJECTIONS

TABLE 3.1
 NEWTOWN' S SHARE OF CONNECTICUT'S POPULATION BY AGE AND SEX
 1980-2000 (HISTORY) AND 2010-2030 (PROJECTIONS)

		1990	2000	2005	2010	2015	2020	2025	2030
MALE	Total Male	0.6537%	0.7769%	0.8220%	0.8448%	0.8844%	0.9272%	0.9718%	1.0106%
	0 - 4	0.6358%	0.9253%	0.9733%	0.9998%	1.0432%	1.0865%	1.1310%	1.1708%
	5 - 9	0.7338%	0.8968%	0.9452%	0.9726%	1.0165%	1.0601%	1.1049%	1.1451%
	10 - 14	0.7372%	0.8844%	0.9330%	0.9608%	1.0048%	1.0485%	1.0935%	1.1339%
	15 - 19	0.7094%	0.6820%	0.7334%	0.7678%	0.8146%	0.8609%	0.9080%	0.9509%
	20 - 24	0.4508%	0.4627%	0.5171%	0.5587%	0.6085%	0.6576%	0.7068%	0.7526%
	25 - 29	0.4519%	0.5191%	0.5727%	0.6125%	0.6616%	0.7099%	0.7586%	0.8036%
	30 - 34	0.5815%	0.7537%	0.8041%	0.8362%	0.8820%	0.9274%	0.9737%	1.0157%
	35 - 39	0.7629%	0.9608%	1.0084%	1.0337%	1.0767%	1.1195%	1.1636%	1.2030%
	40 - 44	0.8653%	0.9576%	1.0052%	1.0306%	1.0736%	1.1165%	1.1607%	1.2001%
	45 - 49	0.8912%	0.9090%	0.9573%	0.9843%	1.0280%	1.0714%	1.1161%	1.1561%
	50 - 54	0.8708%	0.8409%	0.8901%	0.9193%	0.9639%	1.0082%	1.0537%	1.0946%
	55 - 59	0.7136%	0.8199%	0.8694%	0.8993%	0.9442%	0.9888%	1.0344%	1.0756%
	60 - 64	0.6013%	0.7355%	0.7861%	0.8188%	0.8649%	0.9105%	0.9570%	0.9993%
	65 - 69	0.4389%	0.6309%	0.6830%	0.7191%	0.7666%	0.8135%	0.8611%	0.9047%
	70 - 74	0.4233%	0.5325%	0.5860%	0.6253%	0.6742%	0.7223%	0.7709%	0.8158%
	75 - 79	0.4425%	0.3858%	0.4413%	0.4854%	0.5363%	0.5863%	0.6363%	0.6831%
	80 - 84	0.5162%	0.4022%	0.4574%	0.5010%	0.5517%	0.6015%	0.6514%	0.6979%
	85+	0.5883%	0.4238%	0.4788%	0.5217%	0.5720%	0.6215%	0.6712%	0.7175%
FEMALE	Total Female	0.6119%	0.6956%	0.7224%	0.7293%	0.7520%	0.7777%	0.8054%	0.8278%
	0 - 4	0.6647%	0.8845%	0.9136%	0.9232%	0.9492%	0.9754%	1.0030%	1.0268%
	5 - 9	0.7126%	0.8645%	0.8939%	0.9042%	0.9304%	0.9569%	0.9847%	1.0087%
	10 - 14	0.7373%	0.8568%	0.8863%	0.8968%	0.9232%	0.9497%	0.9776%	1.0017%
	15 - 19	0.6871%	0.6484%	0.6808%	0.6981%	0.7273%	0.7565%	0.7865%	0.8133%
	20 - 24	0.4060%	0.2963%	0.3335%	0.3624%	0.3965%	0.4300%	0.4637%	0.4950%
	25 - 29	0.4428%	0.4001%	0.4358%	0.4613%	0.4940%	0.5262%	0.5588%	0.5888%
	30 - 34	0.6134%	0.7235%	0.7548%	0.7697%	0.7979%	0.8261%	0.8554%	0.8812%
	35 - 39	0.7654%	0.9138%	0.9425%	0.9512%	0.9768%	1.0026%	1.0299%	1.0533%
	40 - 44	0.8144%	0.8567%	0.8861%	0.8967%	0.9230%	0.9496%	0.9775%	1.0016%
	45 - 49	0.8427%	0.8434%	0.8731%	0.8840%	0.9106%	0.9373%	0.9653%	0.9896%
	50 - 54	0.7788%	0.7334%	0.7646%	0.7791%	0.8072%	0.8353%	0.8644%	0.8901%
	55 - 59	0.6359%	0.7521%	0.7831%	0.7970%	0.8248%	0.8527%	0.8817%	0.9071%
	60 - 64	0.4205%	0.6210%	0.6537%	0.6720%	0.7016%	0.7311%	0.7614%	0.7885%
	65 - 69	0.4014%	0.5669%	0.6004%	0.6204%	0.6507%	0.6809%	0.7118%	0.7396%
	70 - 74	0.4121%	0.3825%	0.4185%	0.4445%	0.4774%	0.5099%	0.5427%	0.5729%
	75 - 79	0.3480%	0.3741%	0.4102%	0.4365%	0.4696%	0.5021%	0.5350%	0.5653%
	80 - 84	0.4547%	0.4052%	0.4409%	0.4662%	0.4988%	0.5310%	0.5635%	0.5935%
	85+	0.4266%	0.4791%	0.5138%	0.5366%	0.5682%	0.5995%	0.6312%	0.6602%

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

3.4 Projection Results

The Newtown population projections are presented in Table 3.3 on the next page and summarized in Table 3.2 below. Observe that:

(a) The total population of Newtown increased by 20.5% during the decade of 1990-2000. But population growth in Newtown is projected to slow down considerably post 2000 and is projected to increase by 12.2% between 2000 and 2010*, 11.2% between 2010 and 2020, and 8.1% between 2020 and 2030. Altogether it is projected that Newtown's total population will increase by 34.9% over the 30 years between 2000 and 2030, adding 8,739 persons.

TABLE 3.2
PROJECTED TOTAL POPULATION GROWTH
NEWTOWN, CONNECTICUT, 2000 - 2030

	1990-2000*	2000-2010*	2010-2020	2020- 2030	2000- 2030
10-Year Change	4,252	3,058	3,147	2,534	8,739
% Change	20.5%	12.2%	11.2%	8.1%	34.9%

*Note that 1990 and 2000 population data are as of April 1 while 2010 through 2030 populations are as of July 1.

* Note that the population growth between 1990 and 2000 represents changes between April 1, 1990 and April 1, 2000. However, the population growth between 2000 and 2010 represents changes from April 1, 2000 to July 1, 2010.

NEWTOWN POPULATION PROJECTIONS

TABLE 3.3
 NEWTOWN POPULATION PROJECTIONS BY SHARE-RATIO METHOD
 BASED ON THE PROJECTED CONNECTICUT POPULATIONS, 2005-2030
 (Shaded figures represent the numbers of baby boomers)

MALE										
	April 1 1990	April 1 1995	April 1 2000	Jul 1 2005	July 1 2010	July 1 2015	July 1 2020	July1 2025	July1 2030	2005-2030
Total Male	10412	11,613	12,814	13,940	14,619	15,535	16,435	17,251	17,881	28%
<5	744	900	1,056	1,068	1,110	1,217	1,300	1,334	1,333	25%
5-9	786	954	1,121	1,113	1,100	1,157	1,260	1,340	1,367	23%
10-14	731	913	1,094	1,186	1,150	1,149	1,201	1,303	1,376	16%
15-19	771	765	759	888	944	936	937	982	1,068	20%
20-24	575	508	440	571	663	724	722	726	764	34%
25-29	651	585	519	579	703	804	855	834	823	42%
30-34	856	891	925	841	885	1,046	1,152	1,189	1,134	35%
35-39	1003	1,186	1,369	1,266	1,110	1,162	1,341	1,451	1,477	17%
40-44	1035	1,201	1,367	1,445	1,313	1,167	1,214	1,394	1,500	4%
45-49	874	1,000	1,126	1,355	1,397	1,292	1,147	1,193	1,361	0%
50-54	659	793	927	1,062	1,243	1,305	1,205	1,071	1,110	5%
55-59	506	604	702	892	993	1,179	1,234	1,139	1,009	13%
60-64	421	440	459	603	747	846	1,003	1,051	969	61%
65-69	276	309	341	373	481	610	690	820	859	130%
70-74	207	237	266	271	296	390	498	566	674	149%
75-79	150	155	159	177	184	210	283	368	424	139%
80-84	96	102	108	137	151	159	183	247	322	135%
85+	71	74	76	113	150	183	208	242	312	176%
Median Age	35.5	36.2	36.8	37.9	38.4	38.2	37.9	38.2	38.6	

FEMALE										
	1990	1995	2000	2005	2010	2015	2020	2025	2030	2005-2030
Total Female	10367	11,292	12,217	13,056	13,470	14,130	14,801	15,430	15,889	22%
<5	740	853	966	965	985	1,062	1,116	1,130	1,114	16%
5-9	726	878	1,030	1,008	984	1,017	1,089	1,140	1,147	14%
10-14	702	856	1,010	1,056	1,009	997	1,024	1,092	1,135	8%
15-19	707	695	683	777	797	780	771	794	849	9%
20-24	504	389	274	358	415	449	452	458	482	35%
25-29	636	521	406	446	535	600	626	613	605	36%
30-34	914	918	922	819	845	978	1,052	1,059	1,008	23%
35-39	1028	1,192	1,356	1,250	1,076	1,109	1,260	1,337	1,329	6%
40-44	1023	1,143	1,263	1,337	1,212	1,060	1,090	1,236	1,306	-2%
45-49	861	974	1,087	1,277	1,317	1,212	1,058	1,087	1,224	-4%
50-54	624	744	864	955	1,095	1,152	1,064	933	960	1%
55-59	484	586	687	878	939	1,091	1,144	1,054	922	5%
60-64	329	380	430	561	701	765	893	939	865	54%
65-69	311	336	360	387	494	628	686	800	840	117%
70-74	276	261	245	243	265	351	456	506	598	146%
75-79	186	205	224	234	229	255	338	440	487	108%
80-84	167	178	188	219	225	224	250	332	429	96%
85+	149	186	222	286	348	399	432	479	587	105%
Median Age	36.2	34.5	38.0	39.4	40.4	40.3	40.0	40.3	41.0	

Total M & F										
	1990	1995	2000	2005	2010	2015	2020	2025	2030	2005-2030
Total M&F	20,779	22,905	25,031	26,996	28,089	29,665	31,236	32,681	33,770	25%
<5	1484	1,753	2,022	2,032	2,095	2,279	2,416	2,464	2,447	20%
5-9	1512	1,832	2,151	2,121	2,084	2,173	2,350	2,480	2,514	19%
10-14	1433	1,769	2,104	2,242	2,160	2,146	2,225	2,395	2,512	12%
15-19	1478	1,460	1,442	1,665	1,741	1,715	1,708	1,776	1,917	15%
20-24	1079	897	714	929	1,077	1,173	1,175	1,184	1,246	34%
25-29	1287	1,106	925	1,025	1,238	1,404	1,481	1,448	1,428	39%
30-34	1770	1,809	1,847	1,660	1,731	2,024	2,203	2,247	2,141	29%
35-39	2031	2,378	2,725	2,516	2,186	2,271	2,601	2,788	2,805	12%
40-44	2058	2,344	2,630	2,782	2,524	2,227	2,305	2,630	2,807	1%
45-49	1735	1,974	2,213	2,632	2,714	2,503	2,206	2,280	2,585	-2%
50-54	1283	1,537	1,791	2,017	2,337	2,457	2,269	2,004	2,070	3%
55-59	990	1,190	1,389	1,770	1,932	2,270	2,379	2,194	1,931	9%
60-64	750	820	889	1,164	1,448	1,611	1,896	1,990	1,834	58%
65-69	587	644	701	760	975	1,238	1,375	1,620	1,699	123%
70-74	483	497	511	513	560	742	954	1,072	1,271	148%
75-79	336	360	383	412	413	465	621	808	911	121%
80-84	263	280	296	356	376	384	433	579	751	111%
85+	220	259	298	399	498	582	640	722	899	125%
Median Age	30.9	37.3	37.4	38.6	39.4	39.2	39.0	39.2	39.8	
# Baby Boomers	7146	8505	9,359	9,202	8,431	7,576	6,604	5,491	4,632	

Sources: 1990 and 2000 data are as of April 1st of each year and obtained from the 1990 and 2000 U. S. Census of Population.
 1995 population data are estimates by HCPC and similar to the estimates by the Connecticut State Department of Public Health;
 Population data for the years 2005 through 2030 are projections by HCPC, Inc. based on the share-ratio method.

(b) The comparison of population compositions by age and sex between 2000 and 2030 in Table 3.4 below shows that there will be 2.1% growth in preschool age children (0-4 years old), and moderate growth in elementary, middle, and high school age children.

(c) There will be very little growth among 30 to 54 year old persons especially among females (see shaded figures in Table 3.4). An exception to this growth could occur among 20 to 29 years old males, which is projected to increase by a moderate amount. In the meantime the elderly population (persons aged 55 years and older), particularly among males, is projected to increase very significantly in terms of percentages: for example, 75 to 79 years old males would increase by 167% compared to females in the same age group which is projected to increase by 117%, the 80 to 84 year old male cohort would increase by 198% while its female cohort would grow by 128%, and 85+ males would increase by 31% while the same age females would grow by 165%. Nonetheless, there would be 587 women aged 85 years old and over compared to 312 men aged 85 years old and over in 2030.

TABLE 3.4
COMPARISON OF 2000 AND 2030 POPULATION COMPOSITION BY AGE AND SEX
NEWTOWN, CONNECTICUT 2000 AND 2030

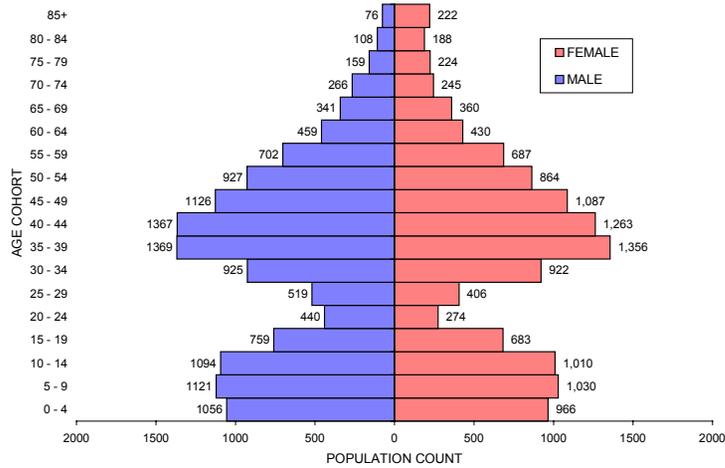
	2000			2030			2000-2030 Change			2000-2030 Percent Change		
	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
Total	12,217	12,184	25,031	15,889	17,881	33,770	3,672	5,697	8,739	30%	47%	35%
<5	966	1,056	2,022	1,114	1,333	2,447	148	277	425	15%	26%	21%
5-9	1,030	1,121	2,151	1,147	1,367	2,514	117	246	363	11%	22%	17%
10-14	1,010	1,094	2,104	1,135	1,376	2,512	125	282	408	12%	26%	19%
15-19	683	759	1,442	849	1,068	1,917	166	309	475	24%	41%	33%
20-24	274	440	714	482	764	1,246	208	324	532	76%	74%	75%
25-29	406	519	925	605	823	1,428	199	304	503	49%	59%	54%
30-34	922	925	1,847	1,008	1,134	2,141	86	209	294	9%	23%	16%
35-39	1,356	1,369	2,725	1,329	1,477	2,805	-27	108	80	-2%	8%	3%
40-44	1,263	1,367	2,630	1,306	1,500	2,807	43	133	177	3%	10%	7%
45-49	1,087	1,126	2,213	1,224	1,361	2,585	137	235	372	13%	21%	17%
50-54	864	927	1,791	960	1,110	2,070	96	183	279	11%	20%	16%
55-59	687	702	1,389	922	1,009	1,931	235	307	542	34%	44%	39%
60-64	430	459	889	865	969	1,834	435	510	945	101%	111%	106%
65-69	360	341	701	840	859	1,699	480	518	998	133%	152%	142%
70-74	245	266	511	598	674	1,271	353	408	760	144%	153%	149%
75-79	224	159	383	487	424	911	263	265	528	117%	167%	138%
80-84	188	108	296	429	322	751	241	214	455	128%	198%	154%
85+	222	76	298	587	312	899	365	236	601	165%	311%	202%

The consequence of these population changes is that a shortage of 30 to 54 year olds in the labor force will gradually develop over the next twenty-five years, and that this unmet labor demand will most likely to be met by the increased participation of females and people of retirement age in the labor market.

FIG. 3-1 NEWTOWN POPULATION PYRAMIDS, 2000 - 2030

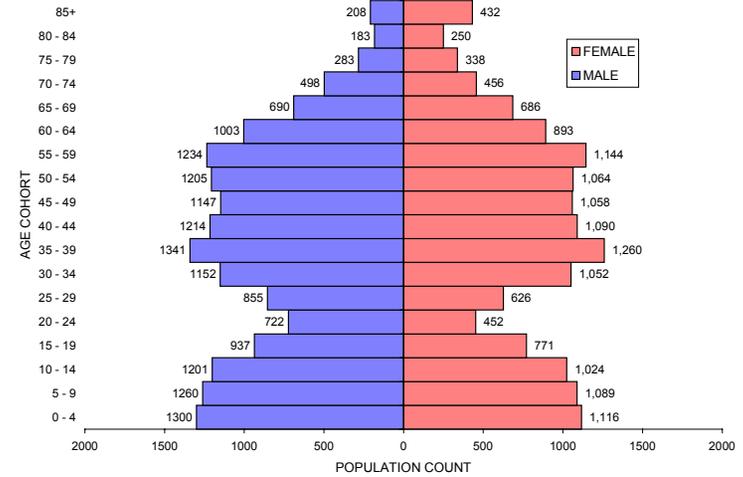
Panel A

2000 NEWTOWN POPULATION PYRAMID



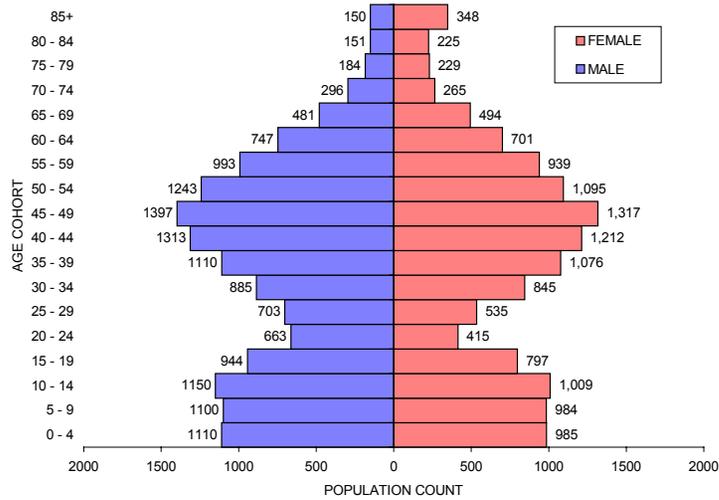
Panel C

2020 NEWTOWN POPULATION PYRAMID



Panel B

2010 NEWTOWN POPULATION PYRAMID



Panel D

2030 NEWTOWN POPULATION PYRAMID

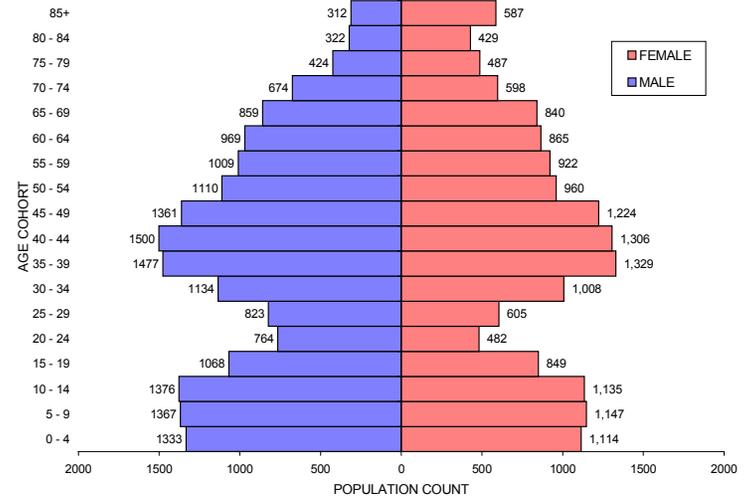
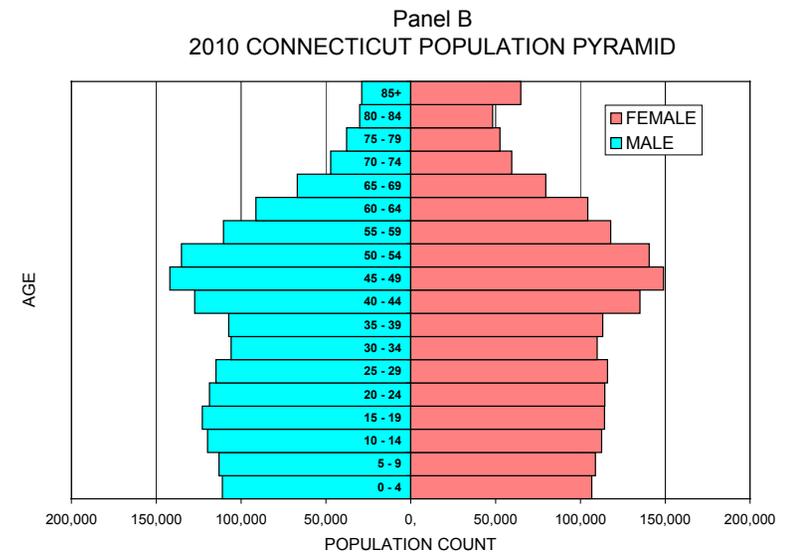
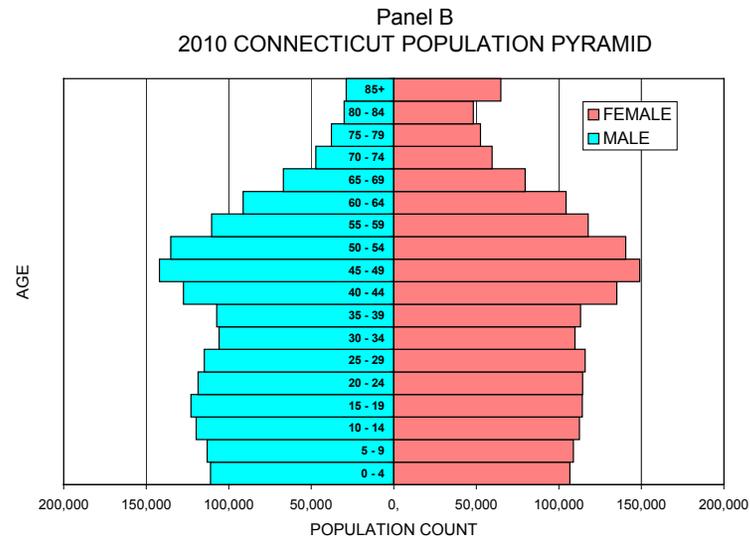
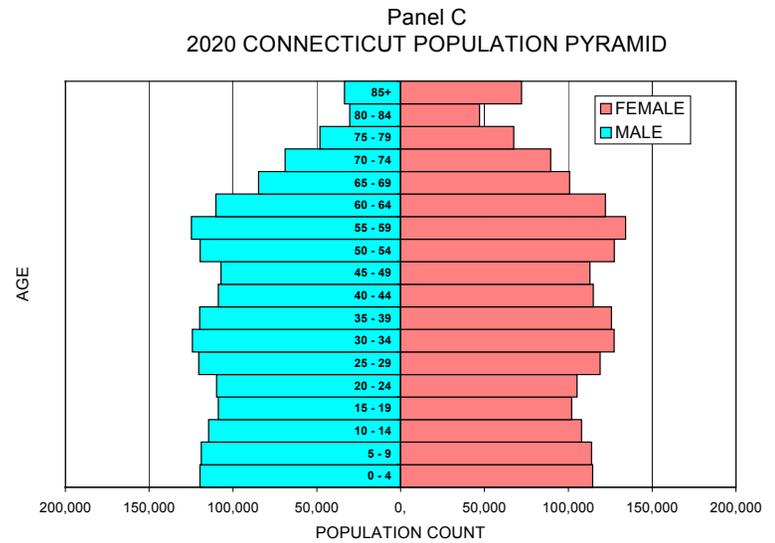
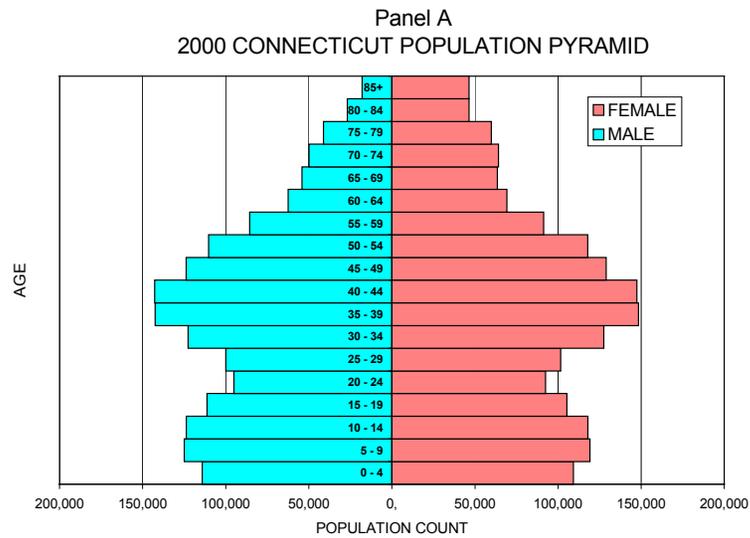


FIG. 3-2 CONNECTICUT POPULATION PYRAMIDS, 2000 - 2030



3.5 Population Pyramids

Population pyramids are a convenient way of viewing the age-sex composition of a given population in a glance. The population sizes of 36 age-sex cohorts are arranged in a horizontal bar graph fashion: the male population is shown on the left side with 18 bars, the female population is shown on the right side with another 18 bars, and the population count of each age group is shown from the youngest (0-4 years old) at the bottom to the oldest (85 years and older) at the top. Normally, in a 'closed' area where there is no in- and out-migration of population, there would be a more or less perfectly shaped population pyramid because there are many more younger people at the bottom and yet relatively fewer older people at the top as the population ages and is more likely to die. However, in an open area where the in- and out-migration of people are frequent, the shape of a population pyramid becomes deformed due to the effects of net migration on the population size of each cohort.

Figure 3-1 contains four panels, presenting the population pyramids of Newtown's populations in 2000, 2010, 2020 and 2030. Similarly, Figure 3-2 contains four panels, presenting Connecticut's population pyramids for the years 2000, 2010, 2020 and 2030. By comparing Newtown's population pyramids to Connecticut's pyramids, we can better understand the unique population structure of Newtown.

2000 Newtown and Connecticut Population Pyramids: As shown in Figure 3-1 Panel A, due to the effects of net migration, population counts for cohorts under 20 years old are more or less the same, but then a narrow 'waist' due to the small 20 to 29 year old cohort appears. This waist represents the 20 to 29 year old youths who normally leave their hometown to attend colleges and universities, settle elsewhere after a marriage, join military service, or work for a firm located elsewhere. Since Newtown is primarily a bedroom suburban town, there are no colleges and not many employment centers that attract young people to the town. An inverted pyramid for the 30 to 39 years old population follows, then a neatly organized pyramid for the age groups older than 40 years appears, perhaps due to the net in-migration of aging baby boomers, but ultimately the impact of increasing mortality rates shrinks the population sizes of the aging cohorts older than 45 years old.

As shown in Figure 3-2 in Panel A, in contrast to Newtown's population pyramid, Connecticut's population pyramid shows that population sizes of cohorts under 35 years old are more or less the same. This is so much the case that Connecticut's population pyramid does not have a distinguishable 20 to 29 year old cohort 'waist.' Connecticut as a whole offers many colleges and universities and employment centers where young people can have the opportunity to pursue professional careers. However, the effects of increasing mortality rates also gradually affect the older age groups. The population sizes tend to diminish so that the population pyramid is more apparent for the age cohorts older than 35 years old.

Population Pyramids for 2010, 2020 and 2030: We can make similar comparisons of the population pyramids for 2010 (Panel B), 2020 (Panel C), and 2030 (Panel D). It is evident that the

base of the Connecticut pyramids gets 'fatter' and the segments located at the upper part of population pyramids get smaller. Two other unique aspects of these pyramids are that there is a larger female population (the right side population bars are longer than the bars on the left), and that the size of the 85 years and older cohort will get especially large for females due to the fact that the life span of both sexes, especially females, is lengthening considerably.

On the other hand, the basic structure of the 2000 Newtown population pyramids will be maintained in the later years: that is, the waist of 20 to 29 year olds will remain. However, there will be a considerable expansion of cohorts older than 30 years old age groups in the 2010, 2020 and 2030 pyramids due to the impact of an increasing number of aging baby boomers. Thus, these pyramids will become much 'fatter' than the slim 2000 pyramid. Nonetheless, even these baby-boomer cohorts will eventually succumb to increasing mortality rates. We can also see that there will be considerably older women than men and that the numbers of females aged 85 years and older will expand significantly.

Median Age: The increasing number of elderly people in Newtown due to the presence of aging baby boomers would have the effect of a rising median age. For men, the median age is projected to rise from 36.8 years in 2000 to 38.4 years in 2010, and then to decline slightly to 37.9 years in 2020, but once again rise to 38.6 years in 2030. On average, Newtown women are older than men: the median age of women was 38.0 years in 2000 and is projected to rise to 40.4 years in 2010, dip to 40.0 years in 2020, but then to rise again to 41.0 years in 2030. By 2010-15, most of the oldest baby boomers born in 1945-46 will reach early retirement age, and by 2030, the youngest baby boomers born in 1965 will have retired so that all baby-boomers will be in retirement. However, by this time, the effects of increasing mortality rates for an aging population will eventually reduce the number of baby boomers: the youngest baby boomers will be 65 years old and the oldest baby boomers will be 85 years old.

3.6 Selected Age Groups

We are especially interested in a few particular age groups which are shown in Table 3.5: preschool children under 5 years old, children aged between 5 and 9 years old (mostly attending grades K-4), children aged between 10 and 13 years old (mostly in grades 5-8 middle school), children aged between 14 to 17 years old (mostly in grades 9-12 high school), the college-age group aged 18 to 22 years old, childbearing age females aged 15 to 44 years old, the labor force age group, and the senior population aged 65 years old and over.*

* There are several methods for *short-term* school enrollment projections such as the Cohort Survival, Share-Ratio, and Multiple Regression methods. However, other long-term population projections are used to approximate the trends of school enrollment growth for the long-term future. The numbers of school-age populations are not exactly same as the numbers of corresponding public school enrollments for several reasons. For example, although the majority of grades K-4 enrollments consist of 5 to 9 years olds, some children are 4 or 10 years old. The student populations include not only public school students but also nonpublic school students. There is no direct way to derive accurate projections of public school enrollments from the population projections. However, the growth and decline trends of school-age populations roughly parallel the general trends of growth and decline in public and nonpublic school enrollments. See the Appendix to Section 3 for further explanation.

Observe the following from Table 3.5 and Figures 3-3 through 3-9:

(a) As shown in Table 3.5 and Figure 3-3, the number of childbearing-age females aged between 15 and 44 years in Newtown is projected to decline until 2010, but would gradually increase to 5,579 persons in 2030. Consequently, preschool children under 5 years old will remain more or less at the current or the year 2000 level until 2010-15 and then will begin to increase moderately in numbers.

TABLE 3.5
NEWTOWN 25-YEAR POPULATION PROJECTIONS
BY SPECIFIED AGE AND SEX GROUPINGS*, 2000-2030

Population Group	Age Group*	April 1 2000 Census	July 1, 2005	July 1, 2010	July 1, 2015	July 1, 2020	July 1, 2025	July 1, 2030	2005 to 2030 % Change
TOTAL:									
MALE & FEMALE	All Age	25,031	26,996	28,089	29,665	31,236	32,681	33,770	25%
Preschool Population	0-4	2,022	2,032	2,095	2,279	2,416	2,464	2,459	20%
K-4 Age Population	5-9	2,151	2,121	2,084	2,173	2,350	2,480	2,514	19%
5-8 Age Population	10-13	1,683	1,794	1,728	1,717	1,780	1,916	2,009	12%
9-12 Age Population	14-17	1,286	1,447	1,477	1,458	1,470	1,545	1,652	14%
College-age Population	18-22	717	890	995	1,047	1,046	1,065	1,137	27%
Young LF Pop.	20-44	8,841	8,913	8,756	9,100	9,765	10,296	10,479	17%
Mature LF Pop.	45-64	6,282	7,583	8,431	8,842	8,749	8,468	8,462	11%
Senior	65+	2,189	2,440	2,822	3,410	4,024	4,801	5,558	127%
MALE									
All Age		12,814	13,940	14,619	15,535	16,435	17,251	17,881	28%
Preschool Population	0-4	1,056	1,068	1,110	1,217	1,300	1,334	1,333	25%
K-4 Age Population	5-9	1,121	1,113	1,100	1,157	1,260	1,340	1,367	23%
5-8 Age Population	10-13	875	949	920	919	961	1,042	1,101	16%
9-12 Age Population	14-17	674	770	797	791	802	850	916	19%
College-age Population	18-22	416	520	586	622	621	632	672	29%
Young LF Pop.	20-44	4,620	4,702	4,674	4,903	5,284	5,594	5,698	21%
Mature LF Pop.	45-64	3,214	3,911	4,380	4,621	4,591	4,454	4,450	14%
Senior	65+	950	1,072	1,261	1,552	1,862	2,244	2,590	142%
FEMALE									
All Age		12,217	13,056	13,470	14,130	14,801	15,430	15,889	22%
Preschool Population	0-4	966	965	985	1,062	1,116	1,130	1,114	16%
K-4 Age Population	5-9	1,030	1,008	984	1,017	1,089	1,140	1,147	14%
5-8 Age Population	10-13	808	844	807	797	819	874	908	8%
9-12 Age Population	14-17	612	677	680	667	668	695	737	9%
College-age Population	18-22	301	370	408	425	426	434	459	24%
Young LF Pop.	20-44	4,221	4,211	4,082	4,196	4,480	4,702	4,730	12%
Mature LF Pop.	45-64	3,068	3,671	4,052	4,221	4,159	4,014	3,971	8%
Senior	65+	1,239	1,368	1,560	1,858	2,162	2,557	2,941	115%

	Age Group	April 1 2000	July 1, 2005	July 1, 2010	July 1, 2015	July 1, 2020	July 1, 2025	July 1, 2030	2005 to 2030 % Change
(a) Childbearing age females	15-44	4,904	4,987	4,880	4,976	5,251	5,496	5,579	12%
(b) K-12 School-Age Population*	5-17	5,120	5,362	5,288	5,348	5,599	5,941	6,176	15%
(c) In Nonpub Schools @10%*	5-17	512	536	529	535	560	594	618	15%
(d) In Public Schools*	5-17	4,608	4,826	4,760	4,813	5,039	5,347	5,559	15%

* Population figures shown in rows b, c, and d represent *only* those who are 5 to 17 years old, excluding K-12 population who are younger than 5 and older than 17 years old (e.g., 4 and 18 years old). Thus, the number of 5 to 17 year olds among K-12 students in public schools (row d) is less than the total public school K-12 enrollments in a given year. See *Appendix to Section 3* for approximations of future Newtown public school enrollments.

FIG. 3-3
TRENDS IN CHILDBEARING AGE FEMALES AND THE GROWTH OF
PRESCHOOL CHILDREN IN NEWTOWN, 2000-2030

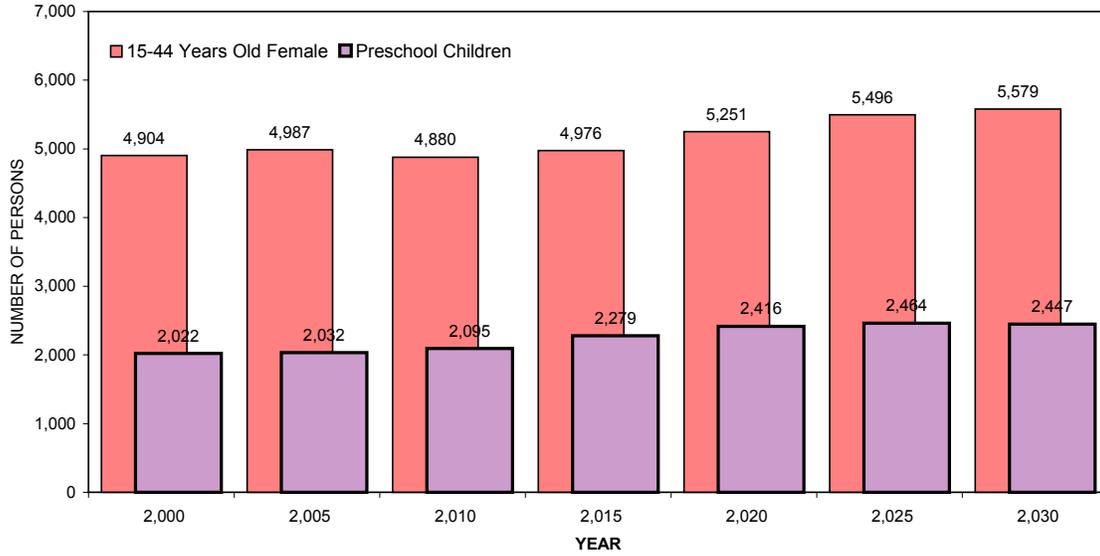


FIG. 3-4
SCHOOL-AGE POPULATION GROWTH TRENDS
NEWTOWN, CONNECTICUT, 2000-2030

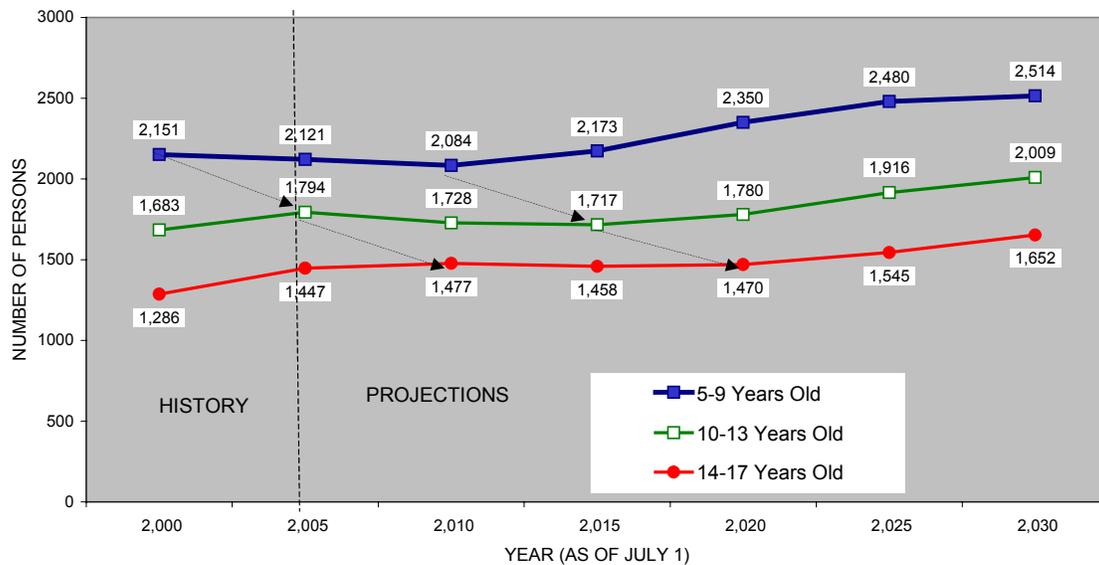


FIG. 3-5
PROJECTED NEWTOWN RESIDENT SCHOOL-AGE POPULATION
ATTENDING PUBLIC AND NONPUBLIC SCHOOLS, 2000-2030

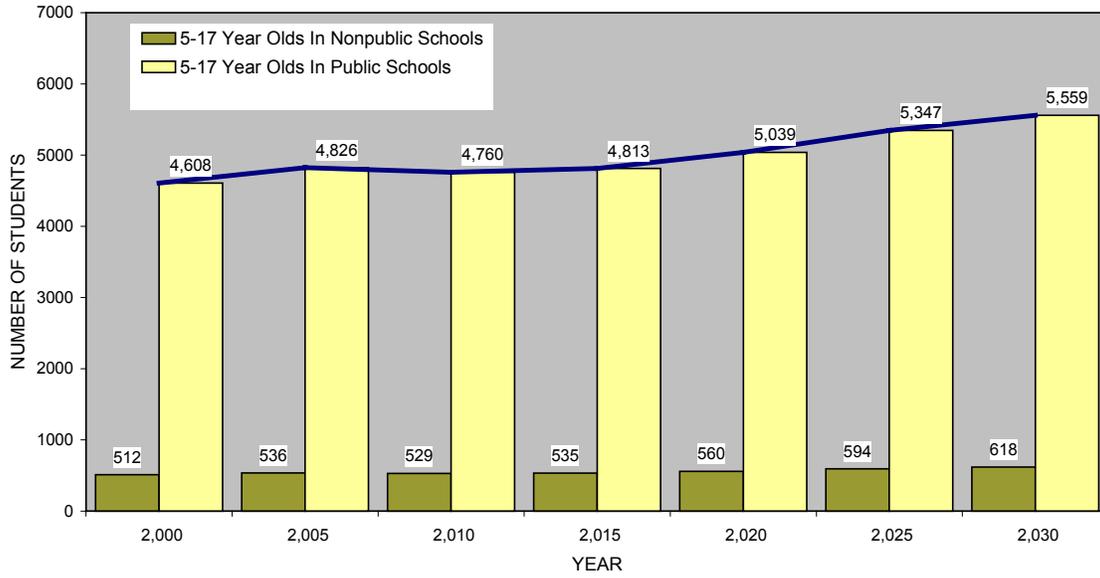


FIG. 3-6
TREND OF COLLEGE-AGE POPULATION
IN NEWTOWN, CONNECTICUT, 2000-2030

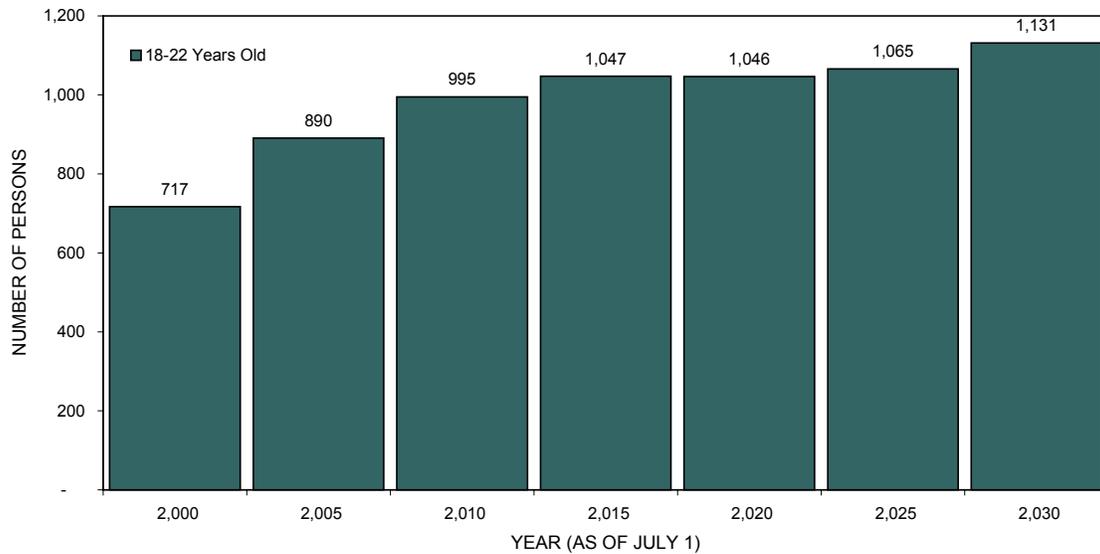


FIG. 3-7
TRENDS OF YOUNG AND MATURE LABOR FORCE
IN NEWTOWN, CONNECTICUT 2000-2030

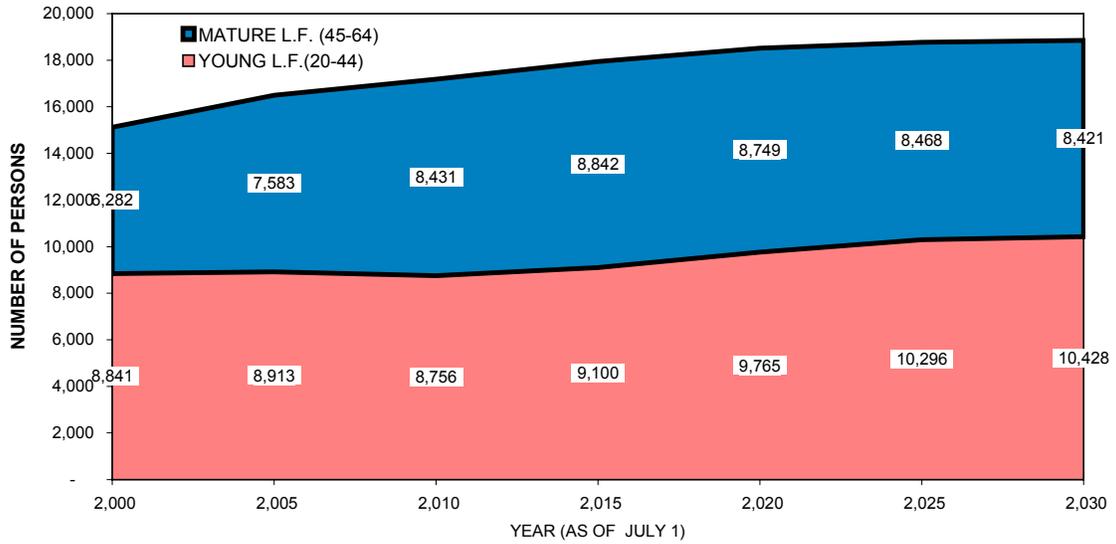


FIG. 3-8
GROWTH OF SENIOR POPULATION AGED 65 YEARS AND OLDER BY
SEX, NEWTOWN, CONNECTICUT, 2000-2030

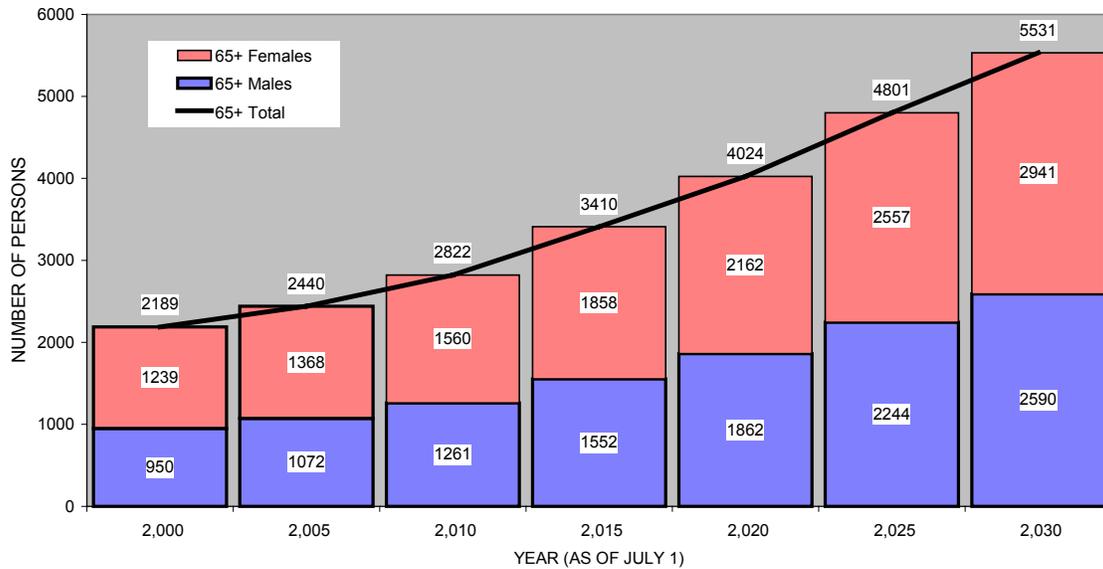
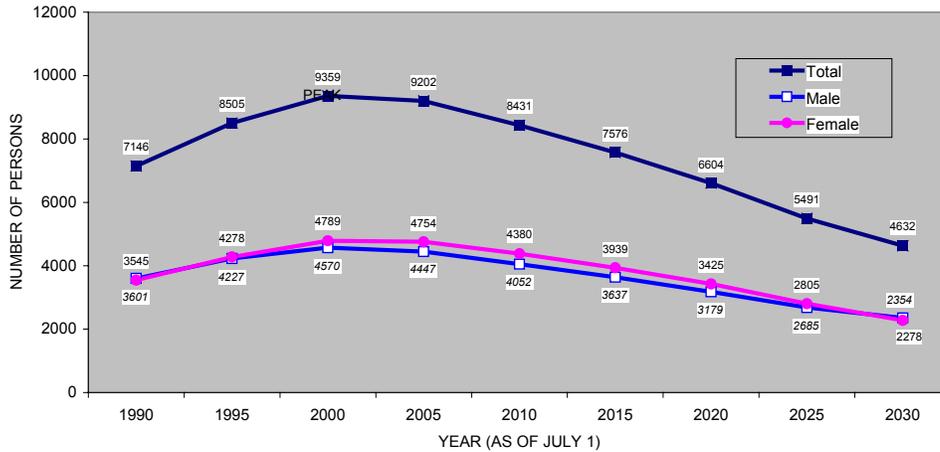


FIG. 3-9
AGING BABY BOOMERS
IN NEWTOWN, CONNECTICUT, 1990-2030



(b) As shown in Figure 3-4, the number of 5 to 9 years old children* in Newtown will decline slightly from 2,151 children in 2000 to 2,084 children in the year 2010, but will begin to regain in loss in population during the previous years to reach a higher level of 2,514 children in 2030. In the meantime, the number of grades 5-8 children aged between 10 and 13 years old* in Newtown will decline from 1,794 children in 2005 to 1,717 children in 2015, and then reverse its course to reach 2,009 children in 2030. Note also that the high school population aged between 14 and 17 years old (but not including 13 and 18 years olds)* is projected to increase from 1,458 children in 2015 to 1,652 children in 2030.**

(c) Figure 3-5 and panel B of Table 3.5 show that the number of grades K-12 students aged 5 to 17 years old (but not including children aged 4 and 18 years old) in Newtown public schools is projected to decline from 4,826 children in 2005 to 4,760 students in 2010. The number should then begin to grow again and reach the level of 5,559 children in 2030. Assuming that 10% of the population aged 5 to 17 years old in Newtown will enroll in nonpublic schools, approximately 500 to 600 of Newtown's age 5-17 population will attend schools other than the local public schools (i.e., private/parochial schools, public schools in other towns, regional voc-tech schools, home education, and out-of-town special education students). The remaining 90% of the school age population will attend Newtown public schools.**

* Elementary school students in a town consist of mostly 5 to 9 years old, but some grades K-4 children are younger than 5 and older than 9. Thus, the number of children aged 5 to 9 years is somewhat smaller than the size of grades K-4 school enrollments in a given year. Similarly, grades 5 to 8 school students in a town consist of mostly 10 to 13 years old, but also include children younger than 10 and older than 13. Thus, the number of children 10 to 13 years is somewhat smaller than the size of grades 5-8 school enrollments. For similar reasons, the number of 14 to 17 year old high school age children is somewhat smaller than the grades 9-12 high school enrollments.

**See the *Appendix to Section 3* for further explanation.

(d) Figure 3-6 shows that the college-age population aged between 18 and 22* residing in Newtown will increase slightly from 890 persons in 2005 to 1,047 persons in 2015 and then remain more or less at that level until 2025 when the number will increase again to 1,131 persons in 2030. In short, from the year 2010 throughout the next 20 years, the number of college-age youths taking residence in Newtown will remain more or less at the level of 1,000 persons.

(e) According to Figure 3-7, the young labor force population which is aged between 20 and 44 years old is projected to decrease from 8,913 persons in 2005 to 8,756 persons by 2010. However, this group will increase gradually to 10,428 persons in 2030, adding 1,672 persons (an increase of +19.1%) over the next twenty years. On the other hand, the mature labor force aged between 45 and 64 years old is projected to remain the same or to decrease very slightly from 8,431 persons in 2010 to 8,421 persons in 2030, a reduction of only 10 persons. A stagnant labor-force age population implies that a shortage in the mature labor force will develop in the future.

(f) As shown in Figure 3-8, the elderly population is projected to increase dramatically; there will be a total of 2,822 seniors in 2010 and the number is likely to nearly double to 5,531 persons in 2030, an increase of 2,709 persons or 96% in two decades. Note also that the *female* elderly population will increase from 1,560 persons in 2010 to 2,941 persons in 2030, an increase of 1,381 elderly women or 89%. At the same time, *male* seniors are projected to increase from 1,261 persons in 2010 to 2,590 persons in 2030, an increase of 1,329 persons or 105% within two decades.

(g) The significant expansion of the elderly population is due to the aging of baby boomers born between 1945 and 1965. In the year 2000, baby boomers were 35 years (the youngest baby boomers were born in 1965) to 55 years old (the oldest baby boomers were born in 1945), but in the year 2030, the youngest baby boomers will reach the retirement age of 65 and the older baby boomers will reach 85 years old. In short, by 2030, all baby boomers will reach the retirement age. Accordingly, the number of baby boomers peaked in 2000 and will gradually decline over the next 30 years as shown in Figure 3-9.

* It means that the majority of college students are 18 to 22 years old. Some college students are younger than 18 and older than 22 years old.

3.7 Population in Group Quarters

Our population projections include people living in the group quarters located in Newtown. According to the 2000 U. S. Census of Population there was a total of 894 persons in such living arrangements. Of these, 694 persons lived in the town’s correctional institution (Garner correctional institution which is administered by the state)*, 183 persons were in nursing homes,** and the remaining 17 persons were living in non-institutionalized group quarters. Of 894 persons living in the group quarters, 182 persons (20.4%) were 65 years and older and the remaining 710 persons (79.4%) were between 18 and 64 years old.

TABLE 3.6
NEWTOWN POPULATION IN GROUP QUARTERS, 2000

Subject	Number			Percent		
	Both sexes	Male	Female	Both sexes	Male	Female
AGE						
Group quarters population	894	740	154	100.0	100.0	100.0
Under 18 years	2	2	0	0.2	0.3	0.0
18 to 64 years	710	697	13	79.4	94.2	8.4
65 years and over	182	41	141	20.4	5.5	91.6
Institutionalized population	877	732	145	100.0	100.0	100.0
Under 18 years	1	1	0	0.1	0.1	0.0
18 to 64 years	694	690	4	79.1	94.3	2.8
65 years and over	182	41	141	20.8	5.6	97.2
Non-institutionalized population	17	8	9	100.0	100.0	100.0
Under 18 years	1	1	0	5.9	12.5	0.0
18 to 64 years	16	7	9	94.1	87.5	100.0
65 years and over	0	0	0	0.0	0.0	0.0
TYPE OF GROUP QUARTERS						
Group quarters population	894	740	154	100.0	100.0	100.0
Institutionalized population	877	732	145	98.1	98.9	94.2
Correctional institutions	694	692	2	77.6	93.5	1.3
Nursing homes	183	40	143	20.5	5.4	92.9
Hospitals, wards and hospices for chronically ill	0	0	0	0.0	0.0	0.0
Mental (Psychiatric) hospitals or wards	0	0	0	0.0	0.0	0.0
Juvenile institutions	0	0	0	0.0	0.0	0.0
Other institutions	0	0	0	0.0	0.0	0.0
Non-institutionalized population	17	8	9	1.9	1.1	5.8
College dormitories	0	0	0	0.0	0.0	0.0
Military quarters	0	0	0	0.0	0.0	0.0
Other non-institutionalized group quarters	17	8	9	1.9	1.1	5.8

Source: U.S. Census Bureau, Census 2000 Summary File 1 (100-Percent Data), Matrix PCT17.
<http://factfinder.census.gov/home/en/datanotes/expsf1u.htm>.

*The Garner Correctional Institution incarcerates both pretrial and sentenced offenders. As of July 1, 2007, there were 554 inmates, consisting of 143 accused individuals and 411 already sentenced individuals.

**Ashlar of Newtown is part of Masonicare, a not-for-profit senior healthcare network.

Appendix to Section 3

APPROXIMATIONS OF FUTURE NEWTOWN PUBLIC SCHOOL ENROLLMENTS

(a) Introduction: The Newtown Public Schools employed a consultant (Bothwell Consulting) to prepare 10-year (2008-2017) school enrollment projections by grade.* However, the town wishes to know the enrollment growth trends beyond 2017 in order to assess the needs for school facilities expansions. Although the 25-year growth trends of *school-age populations* were described in Table 3.5 and Figures 3-4 and 3-5 of this report, we have prepared this special appendix** to present the long-term trends of Newtown *public school enrollments* which were estimated using the projected school-age populations.

(b) Limitations: The future trends in projections for school-age populations serve as approximate indicators of future trends in corresponding school enrollments. However, reasonably accurate projections of public school enrollments cannot be derived from the projected populations for various reasons. For example, school enrollments are counted as of October 1 in each school year while the population figures for the year 2000 are derived from a census, which is taken as of April 1. To complicate issues further, the populations of 2005 through 2030 are projected as of July 1 of each year. Another issue is that projected school-age populations include both public and nonpublic school enrollments so that they cannot be compared directly to the figures for public school enrollments. Finally, although grades K-4 enrollments consist of mainly 5-9 years old children, some elementary schools include students who are 4 and 10 years old. Similarly, grades 5-8 students consist of mainly children aged 10 through 13 years, but some students are 9 and 14 years old. The same complication applies to high school students.

Thus, the numbers available for public school enrollments do not neatly correspond to the school age population groups. Accordingly, demographers do not use population projections as a means of projecting school enrollments. They instead use several methods which are tailored to project school enrollments: these methods include the Cohort Survival Method, the Share-Ratio Method, and the Multiple Regression Method.# While school enrollment projection methods are in general used for five-to- ten-year projections, very long-term (20 to 30 years) population projections can be valuable indicators of rough school enrollment trends. Notwithstanding these limitations, the Newtown school enrollment growth/decline patterns generally parallel those of school-age populations as shown in Figures 3-10 through 3-13.

(c) Grades K-4 Enrollment Growth Trends: As shown in Figure 3-10, grades K-4 enrollments were 2,006 students in 2000, 2,108 students in 2005, and 2,031 students in 2007 (the 2007 figure is not shown in Figure 3-10). According to Bothwell's "most likely to occur" high projections (Bothwell, page 8), the K-4 enrollments in Newtown public schools are expected to decline slightly to 2,024 students in 2010; numbers will then decline sharply to 1,760 students in 2015 and to 1,736 students in 2017.

* *Enrollment Update for the Newtown Public Schools, December, 2007*, prepared by Bothwell Consulting, Kent Lakes, NY.

** The preparation of school enrollment projections is normally not a part of a study of population projections.

In general, these methods are used for 5 to 10 year enrollment projections. However, they may be employed for much longer-term enrollment projections.

In contrast, our approximations show that the K-4 enrollment would *decline* to 1,914 students in 2010 and to 1,904 students in 2015, but that enrollments would then increase after 2015 to reach 2,316 students in 2030. In sum, both Bothwell projections and HCPC approximations indicate that the Newtown elementary school enrollments will decline until 2015. However, Bothwell's projections indicate a continued decline in K-4 enrollments beyond 2015 while HCPC estimates that K-4 enrollments will reverse this trend and begin to add more students beginning some time after 2015. (Bothwell projections are shown by a dotted line in Figure 3-10.)

FIG. 3-10
 GRADES K-4 PUBLIC SCHOOL ENROLLMENT PROJECTIONS BASED
 ON PROJECTED POPULATIONS, NEWTOWN, 2000-2030

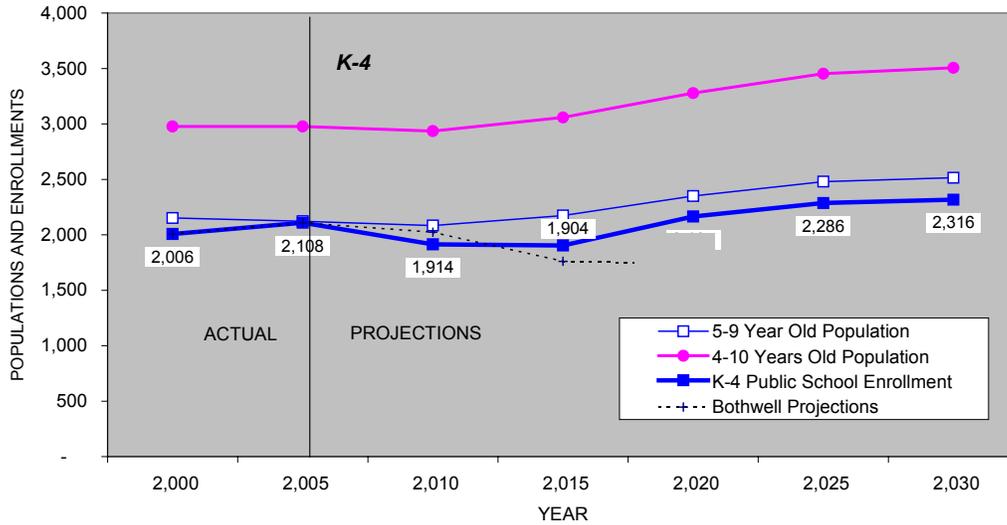
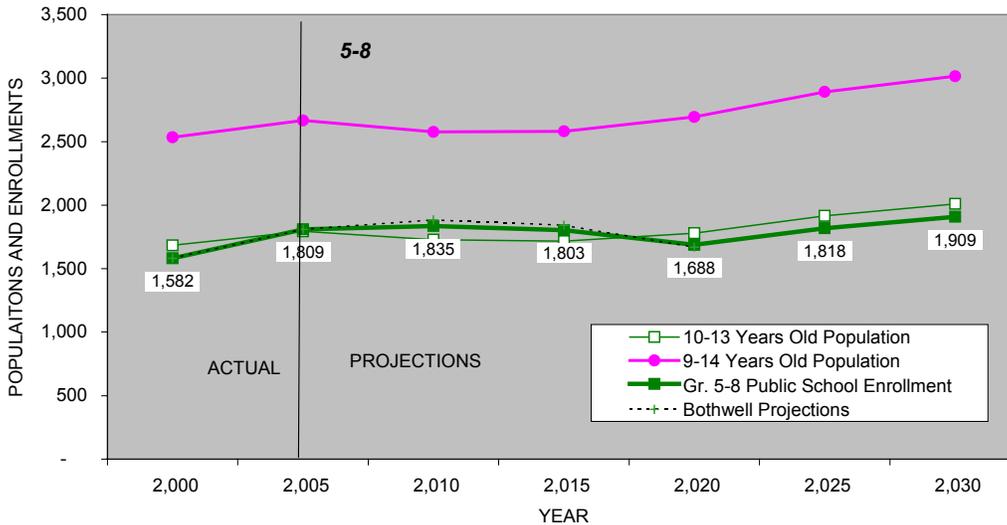


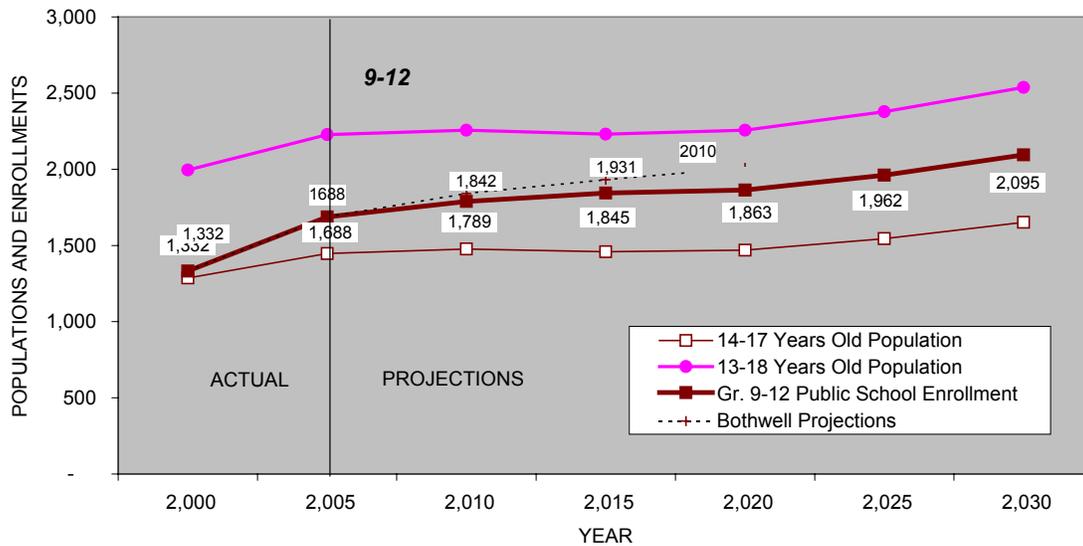
FIG. 3-11
 GRADE 5-8 PUBLIC SCHOOL ENROLLMENT PROJECTIONS BASED
 ON PROJECTED POPULATIONS, NEWTOWN, 2000 - 2030



(d) Grades 5-8 Enrollment Trends: Figure 3-11 on the previous page shows that the actual grades 5-8 enrollments in Newtown increased from 1,582 students in 2000 to 1,809 students in 2005, and to 1,816 students in 2017. Both Bothwell and HCPC indicate that the grades 5-8 enrollments will increase until 2010, and then decrease over the next ten years until 2020. HCPC then indicates that the grades 5-8 enrollments will grow, reaching 1,909 students in 2030.

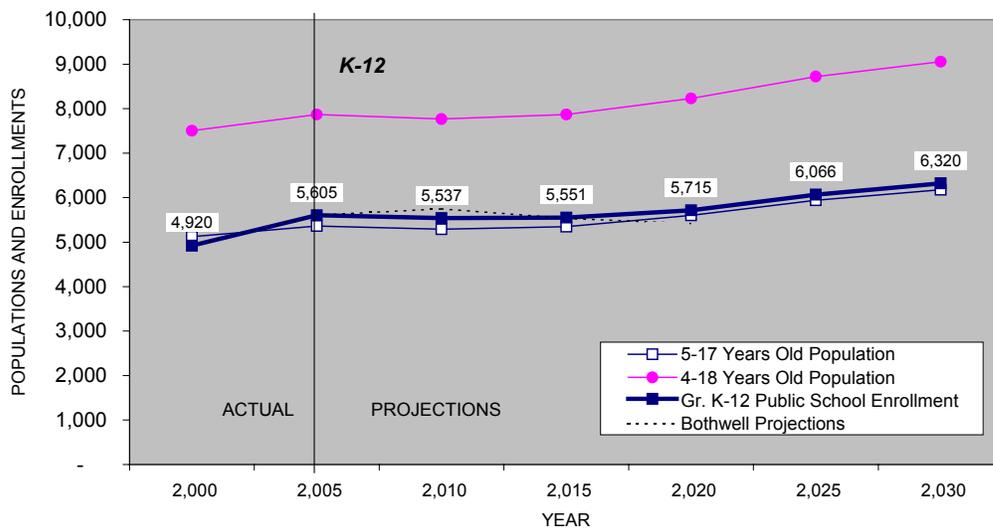
(e) Grades 9-12 Enrollment Trends: Figure 3-12 shows that the actual high school enrollments in Newtown public schools increased from 1,332 students in 2000 to 1,688 students in 2005, and to 1,719 students in 2007 (the last figure is not shown in Figure 3-12). Bothwell projected that the high school enrollment will continue to increase to 1,842 students in 2010, to 1,931 students in 2015 and further to 2,010 students in 2017 (see dotted line). In contrast, HCPC estimates that the Newtown high school enrollments will increase until 2020 but that the increase will occur at a slower rate than Bothwell has projected. The enrollments will then continue to increase, reaching 2,095 students in 2030. In sum, high school enrollments will add 376 students or increase by 22% over the next 23 years between 2017 and 2030. Note that there will be slow growth until 2020 but then the rate will pick up between 2020 and 2030.

FIG. 3-12
 GRADES 9-12 PUBLIC SCHOOL ENROLLMENT PROJECTIONS BASED
 ON THE PROJECTED POPULATIONS, NEWTOWN, 2000-2030



(f) K-12 Public School Enrollment Trends: Figure 3-13 presents the grades K-12 public school enrollments between 2000 and 2030 by combining the grades K-4, 5-8 and 9-12 enrollment growth patterns. Bothwell projected that the Newtown K-12 enrollments would increase from 5,628 students (excluding PK) in 2000 to 5,811 students in 2010, and then would decline to 5,476 students in 2017. In contrast, HCPC's estimated populations indicate that K-12 enrollments will decline from 5,605 students in 2005 to 5,551 students in 2015, but then will increase gradually to 5,715 students in 2020, 6,066 students in 2025 and further to 6,320 students in 2030.

FIG. 3-13
 GRADE K-12 PUBLIC SCHOOL ENROLLMENT PROJECTIONS BASED
 ON PROJECTED POPULATIONS, NEWTOWN, 2000 - 2030



(g) Implications for School Facility Planning: School enrollment projections are reasonably accurate for the first 4 to 5 years because the projections are based on the known number of births. However, enrollment projections beyond the first five years are considered tentative because they are based on the 'projected' or 'assumed' number of births. Also, future school enrollments are subject to the changes in various additional factors such as new home construction, nonpublic school enrollments, home sales, in- and out-migration of population, and prevailing economic conditions. Nonetheless, from our tentative enrollment approximations, it appears that there will be a moderate decline or no substantial enrollment change until 2015-2020; however, enrollments will begin to increase after 2015-2020. *

* School enrollments are expected to decline because of declining births and sluggish economic conditions in evidence since 2000. Obviously, increasing school-age populations and enrollments are based on the assumptions that the number of births will reverse its declining trends due to the 'Echo Baby Boom' of the 1980s and 1990s, and the recovery of sluggish national and regional economic conditions.