STOW, MASSACHUSETTS

DEMOGRAPHY AND K-8 ENROLLMENT PROJECTIONS

April, 2005

NESDEC

New England School Development Council

Planning and Management Services

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INTRODUCTION AND EXECUTIVE SUMMARY

The New England School Development Council (NESDEC) was asked by the Stow School Building Committee to develop a demographic report and ten-year enrollment projection for Stow students, K-8, including the impact of increased development. Data regarding Preschool students are included in separate totals.

Notable points of the Report are these:

- Since 1994, Stow K-8 school enrollments have grown by 104 students, from 715 to 819 students in 2004-05.
- Over the next ten years, Stow K-8 enrollments are conservatively projected to grow by 80 students to 899 students by 2011-12, even without considering the recently increased pace of residential development.
- Stow school enrollments are driven by a combination of factors including new residential construction, turnover of existing homes, net in-migration (in part influenced by positive perceptions of the public schools and quality of life issues), and by births.
- Additional residential development, combined with in-migration and housing turnover could yield about 20 students per year beginning about 2007 (pupils not accounted for in the conservative projections described above).
- The distribution of these additional students is expected to be 70% elementary, 20% middle grades, 10% high school in ownership dwellings (60% elementary-20% middle-20% high school in rental units). Thus, with the impact of additional development, Stow K-8 enrollments could increase by 230 pupils to 1049 K-8 students in 2017-18, compared with 819 K-8 students in 2004-05.
- Although multi-family housing has not played a major role in Stow's historic tradition, it has become a reality in many suburbs similar to Stow; thus an appendix provides data on the student-yield of multi-family housing in several communities with a high ratio of students (similar to Stow's experience).
- Three "Then-Now" charts are included to shed light on a factor which often is overlooked: new educational programs have decreased the student capacity of older school buildings across America.

Stow deserves to be commended for commissioning this study. The town is engaged in thoughtful, data-based planning and prudent use of available resources. Planning for school needs begins with a firm grounding in community data and accurate forecasting of future school enrollments.

DEMOGRAPHY AND ENROLLMENT PROJECTIONS

A. TOWN-RELATED FACTORS: STOW

The preparation of enrollment forecasts is an integral part of the long-range planning process for the Stow District. Some of the factors to be considered in this effort pertain to the Town of Stow – specifically, the population size and age composition, growth and nature of housing units, number of births to residents, and in/out migration patterns.

Unless otherwise noted, the statistical information in Tables 1-7 is from the 2000 Federal Census. Although these data were gathered almost five years ago, they offer the most complete snapshot available, and are augmented and brought up-to-date by estimates. Census data are buttressed by information from the Town Office, Building Department, School Department and town records, as well as the Massachusetts Department of Public Health, Metropolitan Area Planning Council (MAPC), Community Planning Initiative (CPI) of the Executive Office of Environmental Affairs, and The Warren Group, *Banker and Tradesman.* Also helpful were conversations with area realtors, and a visual inspection of several Stow neighborhoods. Linda Hathaway, Karen Kelliher, Kay Desmond, Ellie Beaudette, and Bill Wrigley were helpful at Town Hall as well as Kathy McKinstry of the School Department. Bruce Fletcher, Greg Jones, and Steve Dungan provided useful information. For case study information on student yield of multi-family properties, "Housing the Commonwealth's School Age Children: The Implications of Multi-Family Housing Development for Municipal and School Expenditures" Childrens' Housing and Planning Association (CHAPA, 2003) is furnished with this Report. Authors of the CHAPA report, Judith Barrett and John Connery, were helpful as well.

Population Size - Tables 1, 1A, 1B

Stow is a residential community with rural aspects of 18.1 square miles (including .47 square miles of water), served by Routes 62 and 117, located 25 miles northwest of Boston and 28 miles northeast of Worcester. Stow benefits from easy access to Routes I-495, I-90, 2 and 20 as well as the MBTA commuter rail stop in South Acton. The town, known as Pompositticut Plantation until 1683, values its past and retains a significant

agricultural component. As Table 1 and the accompanying graph demonstrate, 10.8% growth (+574 persons) occurred in Stow's population between 1990 and 2000, double the state's growth of 5.5%. In the previous decade (1980-1990), Stow grew by 3.6% (+184 persons).

Table 1A displays Stow's 1.3% annual growth from 2000-2003; this growth of 78 persons per year since 2000 is at a pace slightly greater than experienced during the decade of the 1990's. Table 1B places Stow's growth in a regional context. Other than Concord which shrank in population, Stow's neighboring towns grew by varying amounts. Bolton, Boxborough, and Harvard grew by more than 20%; Acton, Lancaster, Littleton, Sudbury, and Wayland increased by more than 10%; and Ayer, Berlin, Clinton, Hudson, Lincoln, and Maynard grew by less than 10%. Thus the towns surrounding Stow provide a region of diverse issues with respect to growth. It should be noted that the Massachusetts Institute for Social and Economic Research (MISER) at UMass-Amherst anticipates that the Stow population could shrink by the time of the 2020 Census. See MISER map (and description on pages 6 and 7).

Age Composition – Tables 2, 3, 4, 5

Table 2 and the following graphs indicate that the number and percentage of Stow residents under the age of 18 grew between 1990 and 2000, mirroring the trend in the state and in Middlesex County. Meanwhile the median age in Stow rose from 31.0 in 1980, to 35.8 in 1990, and to 38.8 in 2000 (a rate of aging somewhat greater than the county and state), suggesting both that persons have remained in town and that some newer residents may be older in years.

Table 3 (and the following graph) provide valuable information for helping to project the potential for future births, as well as the potential for future turnover of housing units. It is crucial in understanding the dynamics of growth in Stow during the 1990's to realize that **the population from age 0-34 declined by 86 persons, whereas the age 35+ group increased by 660 persons.** Children in the age 0-4 cohort increased by 21.7% from the number in 1990 (419 children in 1990 v. 510 in 2000); in 2005, these are the 5-9 year olds who impact the school enrollment. The cohorts from ages 20-34, taken together, shrank from 664 persons in 1990 to 491 persons in 2000, a decrease of

173 persons (-26.1%), and it is the size of these cohorts which have the greatest impact on future births. The age cohort from 35-44 increased by 9.4% (+106 persons.) Although, anecdotally we know of women in this latter age range now giving birth, the numbers of births to this age group remain statistically much smaller than the number of births to younger women (88% of births to the younger group v. 12% of births to the older group). Therefore residents in the child-bearing years have declined in the relevant age cohorts, making it unlikely that Stow will experience much of an increase in the number of births in the near future. See the graph displaying Age-Specific Fertility Rates.

In the 1990's, the number of residents age 65 and above rose by 115 persons (+31.1%). The resulting 485 residents age 65 and above can be an important factor in projecting the potential for property turnover (see the discussion of Table 7 in this regard). The 57.9% increase in persons ages 55-64 (+242 persons) suggests continued growth of the "over 60" population in the future and potential property turnover in the 2015-2025 period. A community can grow in population through the turnover of existing housing stock from families with no young children (the "empty nesters") to families with young children.

Table 4 and the related graph indicate a K-12 Stow public school population that shrank in the 1980's and increased in the 1990's, mirroring the state's increase in the percentage of K-12 enrollment. See the Historical Enrollments which follow in Tables 9 and 10. Table 5 and the related graph display the Population by Race and Hispanic Origin. Stow's absolute numbers and percentages remain significantly smaller than the state or county, although the trends are upward. The apparent growth in the "Other" category is, in part, due to a redefinition by the Bureau of the Census. "Other" now includes persons of more than one race which heretofore had to be identified as one race or another. The 2000 Census reported 451 foreign-born residents. Of the 128 persons reporting that they speak English less than "very well", 16 speak Spanish; 60 speak other European languages; and 44 speak Asian languages. When persons were asked to identify their ancestry, 1,720 persons reported Irish or Scots-Irish; 1,506 reported English/Scottish/Welsh; 972 Italian; 801 French/French Canadian; 504 German; 234 Swedish; 202 Polish; 199 "United States" or "American"; 176 Russian; 103 Dutch; 91

Greek; 90 Czech; 56 Lithuanian; 53 Slovak; 51 Norwegian; and 969 "Other", to note the largest groups.

Housing Growth – Tables 6, 6A-E, 7

According to the 2000 Census, Stow increased by 275 dwelling units during the relatively affluent decade of the 1990's, compared with 193 units added during the 1980's. See Table 6. However, the 1990 Census enumerated 15 mobile homes v. none in the 2000 Census, thus 290 permanent dwelling units (275+15=290) were added during the 1990's, a rate of 29 homes built per year. (Some of the mobile homes replaced may have been in the Annex, others may have been temporaries, and a third group may have been at the Firefighting Academy and the MA Department of Shade Tree Management). At the time of the 2000 Census, 98% of all 2,128 dwellings were occupied (Table 6A). Of these, 87% were owner-occupied and 13% renter-occupied. Of the 46 vacant dwellings, 20 were for "seasonal, recreational, or occasional use." During the 1990's, 289 households were added (+16.1%), that is, 2,082 households in 2000 v. 1,793 in 1990. In the vocabulary of the Census Bureau, a "household" is an occupied dwelling. See Table 6B which displays irregularity in the issuance of building permits over the past 35 years. Not included in Table 6B are the occasional "demolitions" listed in Town Reports...17, for example, between 1992 and 1995. Although most demolitions undoubtedly were for barns (examples: Pilot Grove Farm and Hill Top Orchard) or other accessory buildings, a small number have been for the replacement of residences, a west suburban phenomenon yet to hit Stow in significant numbers. The lag from permitting to occupancy to full impact upon school enrollment is described below. In addition to new homes, there are a number of additions or remodelings each year. The number of persons per unit is currently 2.8 persons (Table 6). Stow's numbers per dwelling have been higher than the state average.

The rising cost of dwellings can be seen in Tables 6C and 6D. In 2003, 107 single-family properties (median price $417,500) were sold in Stow. In 2004, 117 single-family homes were sold in Stow at a median price of $435,000. Even this rising median is misleading. A survey of 47 properties recently on the market (Table 6E) revealed only

9 homes priced below $400,000; 4 in the $400's; 15 in the $500's; and 21 in the $600's and above. In the first three months of 2005, 17 single-family homes were sold in Stow (compared with 13 homes in January-March, 2004) thus home sales continue at a brisk pace despite the rise in selling prices. Stow's condo median jumped from $227,900 in 2003 to $381,425 in 2004. Currently, only a small number of parcels of land are available with building lots starting around $300,000+...if they can be found. Although valuations are higher today, a survey in 2000 showed 294 properties valued below $200,000 at that time; 606 properties between $200-299,999; 548 properties from $300-399,999; 163 properties in the $400-499,999 range; and 79 properties valued over $500,000.

The Department of Housing and Community Development (DHCD) indicates that Stow has less than 10% of its housing stock in the "affordable" category, thus Stow may continue to receive Chapter 40B proposals in the future. In addition to new construction, property turnover can increase school enrollments. As seniors seek to downsize, their properties come on the market for potential purchase by young families. The addition of age-restricted housing often triggers an "echo effect", as families with school-age children purchase the vacated larger homes. See description in Appendix. Occasionally somewhat younger empty-nesters will sell their homes, not waiting until they become senior citizens. Sometimes re-valuation causes homes to come on the market, as large increases in assessments trigger owners to place properties on the market in order to realize the financial gain. Spikes in market prices sometimes have the same effect in causing owners to place property on the market - a "buy low-sell high" effect.

There are a number of properties, primarily agricultural land, which could be developed for housing. The potential for substantial growth can be of great concern to the town's infrastructure. However, the current owners have not expressed interest in development in the near future. There also are factors identified as "growth limiters": a portion of Stow is comprised of the Butternut Farm Golf Course, Marble Hill Conservation Area, Minuteman Airfield, Stow Acres Country Club, Stow Away Golf Club, Stow Town Forest, Sudbury State Forest, Susan Lawrence Park, (former) U.S. Military Reservation ("Natick Lab Annex"), cemeteries, conservation, park, and recreation lands, and the Assabet River, Bailey Brook, Elizabeth Brook, Flagg Hill Pond,

Fletcher Pond, Great Brook, Heath Hen Meadow Brook, Lake Boon, Ministers Pond, Sandy Brook, Wheeler Pond, White Pond, and related wetlands. In addition, municipal water or sewer is not available in most of the town.

The Community Preservation Initiative (CPI) of the MA Office of Environmental Affairs estimated in 2000, that Stow was 62% builtout and could add 1,319 additional units before reaching buildout, based upon current zoning (2128 units in 2000 v. 3447 dwellings at buildout). Stow currently has about 59 miles of public roads, with 30 additional miles envisioned by CPI at the time of buildout. This version of buildout would lead to a population increase of 3680 residents (5902 persons in 2000 v. 9582 residents at buildout). No time frame was suggested in the CPI estimate, although at Stow's 1990's rate of 29 new dwellings per year, buildout would not be reached for 45 years. It is likely that conservation and the extensive wetlands probably will decrease the number of units which can be constructed. Although one can speculate on the total buildout population and its timing, it is clear that substantial residential construction can occur within the planning period of this Report (to 2018-19). **See the Stow buildout maps on pages 47 and 48.**

More important to this Report is the question: how much growth will occur over the planning period? The Bureau of the Census has projected that Massachusetts will grow 6.6% in population from 2000 to 2020. MISER, the Massachusetts Institute for Social and Economic Development at UMass-Amherst has taken this projection and forecast which communities will be under the most pressure for development. Bolton is projected by MISER to increase by 2020 to more than 30% of its 2000 population; Boxborough is expected to grow by at least 15%; Harvard by 5 to 15%; Hudson, Littleton, and Maynard are forecast to remain within a +5%/-5% range, and several communities are expected to decrease in total population: Acton, Stow, and Sudbury by -5 to -15%, and Lancaster by -15 to -30%. Although the magnitude of these projections easily can be questioned, the degree of pressure to grow, coupled with the probability of rapidly increasing prices for land and dwellings that may slow growth in some towns, are points worthy of consideration. Massachusetts was the only one among the fifty states to lose population from July, 2003 to July, 2004, with Middlesex County dropping by 0.1% (-1,933 persons). Given Stow's growth from 1990 to 2000 to 2003 (see Table 1A), it

seems counter-intuitive to believe that Stow would lose population from 2000 to 2020. On the other hand, the rapid growth of the I-495 corridor is slowing, and this trend may have some effect upon Stow during the planning period through 2018.

Other Economic Factors

As reported in the 2000 Census, the Stow median family income was $102,530. "Management/Professional" (62%); "Sales and Office Occupations" (20%); and "Service Occupations" (9%) were the largest occupations. "Professional/Scientific" (21%); "Education/Health" (19%); "Manufacturing" (17%); "Retail Trade" (11%); "Finance, Insurance and Real Estate" (5%); "Arts, Entertainment, and Recreation" (4%); "Public Administration" (4%); "Construction" (4%); and "Other Services" (5%) provided the largest number of jobs...agriculture and forestry employment had shrunk to only 1%. In commuting to work, 84% of Stow residents drove alone, 5% carpooled, and 4% took public transportation just over 31 minutes (mean) to their places of employment. Only 26 families had incomes below the poverty level; of these, 15 families had children under the age of 18, and none had children under age 5. There were 114 grandparents living in households with one or more of their own grandchildren under 18 years of age, 12 of these grandparents had the primary responsibility for the care of grandchildren.

Table 7 and graph display the number of K-12 Stow public school students per dwelling. This statistic has decreased from .75 in 1980 to .48 in 1990 and in 2000. **Roughly speaking, every ten Stow dwellings will yield almost five public school students, a statistic higher than the state as a whole (.37 public school students per dwelling unit).** The number of Stow households with individuals under the age of 18 was 896 in 2000. These latter numbers include students in public, private, parochial, and vocational school, school dropouts, and those too young for school.

The 2000 Census documented that 745 households (35%) had moved into their Stow dwelling from 1995 to March, 2000; and 371 households (18%) moved in from 1990 to 1994. 351 households moved into their units between 1980 and 1989 (17%); 395 moved in between 1970 and 1979 (19%); and 220 prior to 1970 (11%). See Table 6A. This percentage when combined with the growing number of residents over age 55

suggests the potential for a significant number of homes to come on the market in the decade from 2010-2020.

Births– Table 8

Table 8 and the accompanying graph display the annual number of Stow births from 1989 to 2003. The Massachusetts Department of Public Health will not release its count of 2004 Stow births until late spring of 2006, however an accurate estimate can be made by comparing the local births reported to the Town Clerk with the experience of recent years (see Table 8A)...generating an estimate in the range of 93-94 births in 2004. Over the past 16 years, the number of Stow births has fluctuated, ranging from 69 to 95. Given the shrinking number of persons in the 20-34 age cohort described in Table 3, there appears to be little potential for the annual number of births to current residents to rise significantly in the near term. It is expected that the annual number of births to Stow residents will level off at about 81-86 per year.

B. HISTORICAL ENROLLMENT

Historical Enrollment – Public Schools – Tables 9, 10, 11

The PreK-8 historical enrollment for Stow students over the past eleven years is shown in Table 9 and following graph and in Table 10 in grade combinations. See technical comments in Appendix (page 19) regarding student enrollment data. Stow K-8 enrollments have grown from 715 students in 1994-95 to 843 pupils at present. Students registered in public Kindergarten, on average, have equaled about 106% of the Stow births five-years previous (105% in fall, 2004); see the graph illustrating the Birth-to-Kindergarten relationship. As this relationship has fluctuated substantially, the Birth-to-Grade 1 Relationship is illustrated in a second graph (to factor out the effect of full-day private Kindergarten). A more typical (and constant) B-to-K relationship in a district is shown as a sample in a third graph. The progress of a Stow class from Kindergarten through the grades can be traced by drawing a diagonal line from Kindergarten, dropping in the following year to Grade 1 then to Grade 2, etc. Stow classes generally grow by about 5% in Grade 1, as students enter from private Kindergarten, or additional students move to town. It is worth noting that Kindergarten classes in Stow are scheduled for

half-day session, and preschool classes are offered primarily for special needs students. A decade ago about 40% of all children in America attending Kindergarten were in a full-day program. In 2003 it is estimated that 60% of all children in Kindergarten are now in full-day programs. Thus this policy issue may be on Stow's agenda in the future. After Grade 1, a Stow class generally has experienced some in-migration through Grade 8...although in some years this has not occurred. In communities which have had unusually expensive housing for some years (Weston, for example), the schools often experience in-migration throughout the elementary and middle-grades, as families become able to afford the asking prices. Whether Stow will begin to experience this phenomenon is not yet clear, although some students newly-registered in Stow are transferring from the "Route 128 belt" where housing prices are even more expensive than in Stow. Table 11 displays the MISER Stability Index, a measure of in-migration or out-migration in the elementary years which generally represent stability of enrollments; the reader will notice that, over the past ten years, there has been in-migration in the selected grades in seven of ten cases, including six of the past seven school years.

Historical Enrollment – Non-Public Schools – Tables 12, 13

The PK-12 historical enrollment of Stow residents in private and parochial schools in recent years has been varied. The Massachusetts Department of Education does not track these enrollments, thus the data are derived from a commendable annual survey by the Stow School Department. Table 11 provides a useful snapshot of trends, yet is likely to be incomplete. Kindergarten is omitted from the chart, as private full-day Kindergarten acts to obscure the pattern. On the surface it would appear that a few more upper grade students attend non-public schools. This may be the case, or may be the result of a more complete survey at certain grade levels. See Table 13 for the impact of non-public enrollments on Stow residents in the present Nashoba High School senior class (Class of 2005). Attention to the excellent Town Census and close liaison with the preschools will help to establish contact with those who later may be attending the Stow Public Schools. Keeping track of this number will give the district a rough estimate of

the potential increase in Kindergarten registrations if the Stow Public Schools should decide to offer a full-day Kindergarten program.

Decisions to attend private or parochial schools are driven by a number of factors, including family tradition, economics, and relative satisfaction/dissatisfaction with various schools, public and private. Some Stow parents may have chosen to enroll their children in non-public schools for family reasons unrelated to the public schools. The American economy during the decade of the 1990's was relatively prosperous. It is unclear how the present economic climate will play out. A policy question which needs to be asked is: what would be our plans if the numbers of Stow students in Grades K-8 currently attending private/parochial schools should begin to shrink? As new numbers become available each fall, the trend in the non-public percentages at each school level will provide additional planning insights.

C. PROJECTED ENROLLMENT – WITHOUT IMPACT OF INCREASED RATE OF DEVELOPMENT

Methodology

The data reported below are "status quo", that is, without the impact of an increased rate of development. The cohort survival technique is the most frequently used method of preparing school enrollment forecasts. NESDEC, indeed, uses this technique, but modifies it in order to move away from forecasts that are wholly computer or formula driven. Such modification permits the incorporation of important and current town-specific information into the generation of the enrollment forecasts. Basically, percentages are calculated from the historical enrollment data to determine a reliable percentage of increase or decrease in enrollment between any two grades. For example, if 100 students enrolled in Grade 1 in 2003-04 and the class increased to 110 students in Grade 2 in 2004-05, the percentage of survival would have been 110%, or a ratio of 1.10. Such ratios are calculated between each pair of grades or years in school over several recent years.

The ratios used are the key factors in the reliability of the projections, given the validity of the data at the starting point. The strength of the ratios lies in the fact that each ratio encompasses **collectively** the variables that could possibly account for an

increase or decrease in the size of a grade enrollment as it moves on to the next grade. Each ratio, then, represents the cumulative effect of the following factors:

1. Migration, in or out, of the schools
2. Retention in the same grade
3. Changes in school program
4. Dropouts, transfers, etc.
5. Births and deaths
6. Housing growth

Based upon a reasonable set of assumptions in regard to each of these factors, ratios most indicative of present/future trends are determined for each pair of grades or years. To project for the future, the ratios thus selected are applied to the present enrollment statistics for a predetermined number of years. In the case of Stow, the assumptions are these:

1. The annual number of births to Stow residents through 2009 will level off at about 81-86 per year;
2. Housing growth over the next ten years will continue to be at the same rate as the recent past (25-33 units per year…see "Stow's Capacity for Additional Growth" below);
3. The pattern and numbers involved in the turnover of existing housing stock will not change appreciably from the recent past (105-120 new households per year);
4. Kindergarten registration will continue at 106% of births (5 years previous); the class will grow at 5% in Grade 1, then grow about 10% (total) through Grade 8;
5. Stow residents in charter schools or school-choice (currently 1-2 per grade), non-public schools, and in home-schooling (currently about 7) will continue at present levels.

If any of these assumptions needs to be altered in the future, so, too, will the projections. It is important to note that NESDEC annually updates projections for affiliated school districts at no cost. This provides an opportunity for the District to plan adequately for any changes that might occur.

Reliability of Projections

While the reliability of projections, in general, rests upon the soundness of the assumptions upon which they are based, there are degrees of reliability over the grades and the ten-year period shown. **The enrollment projection in Table 14 can be divided into three sections. The top and largest section represents the projections based on students who are already enrolled in the Stow Public Schools. This projection has the highest reliability. The projections based on children who have been born, but are not yet in school are somewhat less reliable. The projections for students who are not yet born are the least reliable projections.** It is worth stating, as well, that small schools/towns are the most difficult to project, as the in-/out-migration of only a few families makes a great difference.

A ten-year projection (which drops in reliability after the 5th year) is a very small window into the future. The "leveling" of the elementary enrollment which occurs in years 6-10 of the projections is caused by holding the births stable during that period. If the births should increase during that period (reversing the trend of the last several years); the Kindergarten class will increase, an increase which would ultimately spread to all the elementary grades. If the rate of housing growth were to increase dramatically from past levels (or if property turnover increased markedly), the projections would rise. At all grade levels, improved programs/facilities could lead to additional Stow residents attending (or remaining in) the public schools. Ten-year enrollment projections are just that – projections; they are not guarantees. Whatever the School Committee chooses to do in making plans, it should take into account the possibility of a 10% swing either way in terms of enrollment at all grade levels. In other words, the School Committee should be prepared to respond to the questions: "How will the space be used if 10% **fewer** students materialize?", and "How will the space be provided if 10% **more** students materialize?"

Projections (2005-2018) - Tables 14, 15 – Without Impact of Increased Rate of Development

Total public school enrollment, K-8, (as displayed in Table 14 by grade level, and in Table 15 in grade combinations), is projected to increase from 819 students at present to 899 students in 2011-12, then decline slightly. **This projection represents a conservative approach without the increased pace of residential property development. Rapid property turnover also could add enrollments, above the numbers projected in Table 14. See "Stow's Capacity for Additional Growth" below which addresses the question of additional school children resulting from the development currently in process.**

All of these factors bear careful watching. As new information is obtained, it can be used to further illuminate and/or modify the enrollment projections for Stow. For example, by tracking building permits and property sales, future enrollments can be forecast which will update or modify these projections. In any event, it is clear that the perceived quality of life, to which the public schools are an important contributor, continue to make Stow properties sought-after choices on the real estate market.

Stow's Capacity for Additional Growth: Impact of Increased Development

A well-managed town with good amenities and a reputation for quality of life and good schools can experience additional school enrollments. The K-12 "student yield", calculated across the entire town was .48 public school students per dwelling in 2000, well above the state average of .37 students per dwelling. For new subdivisions, the "student yield" can be as high as double that local statistic: .48 students per dwelling x 2 = .96 students/unit. In the new Wildlife Woods development ("Dawes Property" Fox/Woodpecker/Cardinal/Cricket Court, Wildlife/Whispering Way, and Salamander Lane) there are 24 preschoolers, 18 K-5 students, 5 Grade 6-8 students, and one high school pupil in the 35 units. The time lag from issuance of building permits to occupancy often is 12-36 months. The effect upon school enrollments frequently occurs in three stages: a. at initial occupancy, there may be slight effect on the schools, as some of the children may be toddlers; b. within 2-3 years, many of the children will be in school; c. by 5-6 years after occupancy, a development usually has maximum impact upon

enrollments. The impact felt in the schools, in the early years of ownership developments, usually is about 70% in new elementary enrollments, 20% middle school, and 10% at the high school level. In rental properties, the grade-distribution skew varies widely, often in the range of 60% elementary, 20% middle school, and 20% high school. Accelerated turnover in housing (above the current 105-120 properties per year) also could contribute to additional school enrollments. By doing annual enrollment projections, a free service for NESDEC affiliates, the District can have substantial time to plan for increasing or fluctuating enrollments.

The Community Preservation Initiative of the Massachusetts Office of Environmental Affairs estimated that Stow could add 1,319 additional units before reaching buildout. See buildout descriptions above. Due to the large areas of wetland and undevelopable land in Stow, Town officials feel these estimates are inflated. Recent K-8 enrollment totals in Stow have been sustained, in part, by the addition of about 29 dwellings per year. Thus the enrollment projections in Tables 14 and 15 conservatively assume a continuation of that level of construction.

Table 16 "Projected Enrollment Through 2018…Without/With Impact of Increased Residential Development" displays two K-8 enrollment projection scenarios based upon two different sets of assumptions. These Table 16 enrollment projections do not include Pre-K students (shown in Tables 9 and 14). The following assumptions were used to calculate the second set of projections which include the impact of increased development:

- Pace of development (recently about 29 dwellings per year), approved or in-process, appears to be increasing (34 additional units being built in Wildlife Woods off Sudbury Road; 4 units at Pilot Point off Boxborough Road; 3 units at Red Fox Run/Cranberry Circle off Hudson Road; 3 units at Marble Hill off Taylor Road; 5 more units at Meadowbrook/Trefry Lane off Boxborough Road; 16 age-restricted units at Faxon Farm off Elm Ridge Road; 33 units planned at Derby Woods off Harvard Road; one unit on Randall Road; 5 units in process at Micky's Way off Harvard Road; one unit in the Blue Bird Lane subdivision; and 60 single-family and 36 triplex units pending DEP approval in the Villages at Stow off Great Road and Hudson Road…for a total of 200 units approved or in-process

- As in other communities, the numbers of school-age children in "Dawes Property" (Fox/Woodpecker/Cardinal/Cricket Court, Wildlife/Whispering Way, Salamander Lane) are substantial…this may occur in Cranberry Circle, Meadowbrook, etc. (see expected student-yield above)
- Census 2000 enumerated a 45% increase in residents age 55 and above (who are currently 60 and above), indicating increased potential for property to come on the market due to "downsizing" by Stow residents
- 15-20% of persons moving to age-restricted housing are likely to be Stow residents (causing additional property turnover)
- Recent Town Census reveals in-migration of pre-school children (103 resident children born in 2000 v. 88 Stow births in 2000; 94 resident children born in 2001 v. 78 Stow births in 2001)
- Census 2000 enumerated .48 K-12 students per dwelling v. .75 K-12 students per dwelling in 1980…ratio may again rise
- Rapidly escalating prices in the Route 128 area are causing additional migration to Metrowest
- **These and other factors could combine to add 20 additional PK-12 students per year, not included in Tables 14 and 15 beginning in 2007**
- The additional students are likely to be distributed 70% in elementary grades, 20% middle grades, and 10% in high school…14 additional elementary, 4 middle, 2 high school each year

The Massachusetts Audubon Society has identified Stow as among the top twenty communities in the Commonwealth consuming substantial acreage per new single-family dwelling (and per new permanent resident) during the decade of the 1990's; see "Losing Ground: At What Cost?", Massachusetts Audubon Society, 2003. As this phenomenon occurs, as suburbs strive to add affordable housing, and as shortage of buildable land pushes the price of land (and residential construction) still higher, communities across the Commonwealth often consider the possibility of land use which is more dense. Although multi-family housing has not been a major factor in Stow's history to date, many towns in similar circumstances have begun to receive such proposals. With this point in mind, we

have included an Appendix which summarizes relevant positions of "Housing the Commonwealth's School-Age Children: The Implications of Multi-Family Housing Development for Municipal and School Expenditures" prepared for the Citizens' Housing and Planning Association (CHAPA) in 2003. A copy of the CHAPA Report, which contains forty-two case studies, is furnished with this NESDEC Report. Stow's newly created Stow Housing Partnership undoubtedly will discuss these and other possible solutions.

Developable Land

The maps generated by the Massachusetts Executive Office of Environmental Affairs of developable land in Stow are printed in a greatly compressed format in this Report. Interested readers can view the originals (which are about 5-6 times larger) at http://commpres.env.state.ma/community/cmty_main.asp?communityID=286#Absolute

"Then-Now"

Four "Then-Now" charts are included to display the educational program factors which have combined to reduce the student capacity of older school buildings. Many schools were designed and built when desks were lined up in rows; there were few, if any, special education services, and no use of computers. Such buildings served well the programs for which they were designed. Little storage space for educational materials was required. Twenty-First Century schools, however, are expected to provide a broader program to a more comprehensive spectrum of students. Thus, a school which once housed 400 students a generation ago now may be overcrowded at 300 students. The "Then-Now" charts provide detail in describing this phenomenon, in which **new educational programs have decreased the student capacity of older school buildings.**

APPENDIX

13 Examples of high student-yield in multi-family housing

Town	School Children/Units	Yield/Unit	Comments
Andover	212/444	.48	57% el.
Attleboro	118/184	.64	44% el.
Barnstable	126/220	.57	57% el. all rentals
Bedford	36/ 96	.38	60% el. all rentals
Bedford (second development)	34/40	.85	70% el. ownership
Brockton	35/79	.44	
Charlton	34/40	.85	
Leominster	255/403	.63	40% el.
Lexington	104/198	.53	39% el. 1 BR = 30 2 BR = 113 3 BR = 55
Lynn	351/545	.64	
Mashpee	102/ 73	1.40	70% el. family units
N. Andover	156/254	.61	40% el.
Wilbraham	29/34	.85	67% el. 2/3 BR

Note: 29 communities in CHAPA study had smaller ratio of student yield/unit.

Source: CHAPA (2003)

"Echo Effect"

In many communities, "empty nest" owners have sold their 3-4 bedroom homes and moved to smaller quarters, if available, within their present communities. Thus, when condominiums or apartments become available in towns like Stow, it is not unusual for 15-20% (or more) of the "new" occupants to come from downsizing residents within the same community. Thus we must ask "what is the probability that this phenomenon could occur in Stow?"

In 2000, Stow's housing stock was 87% owner-occupied. Three/four-bedroom homes are common with 7.7 as the median number of rooms in Stow dwellings. Of Stow's 2,082 occupied housing units enumerated in the 2000 Census, 1,162 (56%) had eight or more rooms. Surveys of residences recently advertised on the market reveal a

shortage of properties for persons who are down-sizing. Realtors report similar information and corroborating comments from persons who are placing family homes on the market. Thus it is reasonable to assume that in Stow, as in similar communities, a percentage of any new age-restricted housing will be occupied by current residents of Stow who are down-sizing, and who wish to remain in the community.

Housing, families and school-age children (excerpt from "Housing the Commonwealth's School-Age Children", CHAPA 2003)

- Compared to single-family homes, new multi-family developments almost always house fewer school-age children per dwelling unit. (There is a myth that the number would be greater....NESDEC)

- The probability that multi-family developments will generate school children is influenced by several factors, including:

  - The number and percentage of dwelling units sized for family households. In virtually all cases, developments that offer three- or four-bedroom units generate more school children per unit than developments limited to one- and two-bedroom units.

  - The reputation of a community's public schools. In most cases, multi-family developments in suburbs with sought-after school systems house more school-age children than communities with average or less competitive schools. The same usually holds true for single-family homes. (This is an important factor in the case of Stow which has considerably more school children per dwelling than the state average...NESDEC)

  - Scale, density and location. Large, high-density multi-family developments appear to be less attractive to families with children than low-rise, moderately dense developments with fewer units per building. Developments that offer yards, walkways and common open space typically house more children. In addition, developments located near schools or established residential areas – developments that connect logically to adjoining neighborhoods and the larger community – usually have more children than developments that are isolated, by location or design, or occupy sites near offensive land uses.

  - Composition, age and character of existing housing stock. In communities with relatively high percentages of two-, three – or four-unit homes in traditional neighborhoods, new multi-family developments seem to attract fewer families with school-age children.

  - Units for low – and moderate-income households. Multi-family housing developed exclusively or primarily as affordable to low- and moderate-income families generates more children than a development with 25% low- and moderate-income units, i.e., the minimum required for comprehensive permit development. (The multiplier for low-and moderate-income is generally in the range of 130-140% for 2 BR (and 160% for 3 BR), although a myth exists that the number would be far greater...NESDEC)

- In high growth communities, large multi-family developments that include three- or four-bedroom units accelerate the need for new or expanded community facilities, notably schools. (This factor appears to be minimized in the current proposal...NESDEC)

New multi-family developments often attract renters who already live in the community. (In the case of Stow, these may be seniors...NESDEC). Like homeowners, renters need and look for opportunities to move up to higher-quality housing. The scale, character and location of a new development, coupled with the cost to live there, will influence the extent to which it generates children from in-town moves.

Student Enrollment Data: Technical Comments

There are multiple sets of (sometimes inconsistent) Stow enrollment numbers in the public domain (in Town Reports, in previous enrollment projections, in memos to the School Committee, etc.) In obtaining Stow enrollment data for this Report, NESDEC received a number of files generated at different points throughout the past ten school years. The Massachusetts Department of Education uses October 1 as the official date for recording enrollment data each fall. In 2004-05, for example, there were 100 Stow Kindergarteners, 99 students in Grade 1, and 90 in Grade 2 on October 1, compared with 102 K's, 103 pupils in Grade 1, and 93 in Grade 2 on January 1, 2005. Some school districts, Stow included, have tracked their enrollments on a quarterly or monthly basis. Although this practice is helpful for internal school management, it can lead to a "questioning of the numbers" when several sets of enrollment counts are available for the same school year. NESDEC attempted to use only the standard DOE official October 1 data for Stow residents in preparing this Report. Nor is the DOE blameless: on their website, they have posted Stow PK-8 enrollment data only through 1993-94, after which time the DOE aggregated Stow data into the Nashoba enrollments. Further, the DOE lists all students occupying a Stow seat on October 1, whether or not the student actually resides in Stow, thus a careful reader will inquire into the data collection rules as well.

TABLE 1
TOTAL POPULATION

STATE OF MASSACHUSETTS:

	POPULATION	NO. CHANGE	% CHANGE
1980	5,737,037		
1990	6,016,425	279,388	4.9%
2000	6,349,097	332,672	5.5%

MIDDLESEX COUNTY:

	POPULATION	NO. CHANGE	% CHANGE
1980	1,367,034		
1990	1,398,468	31,434	2.3%
2000	1,465,396	66,928	4.8%

TOWN OF STOW:

	POPULATION	NO. CHANGE	% CHANGE
1980	5,144		
1990	5,328	184	3.6%
2000	5,902	574	10.8%

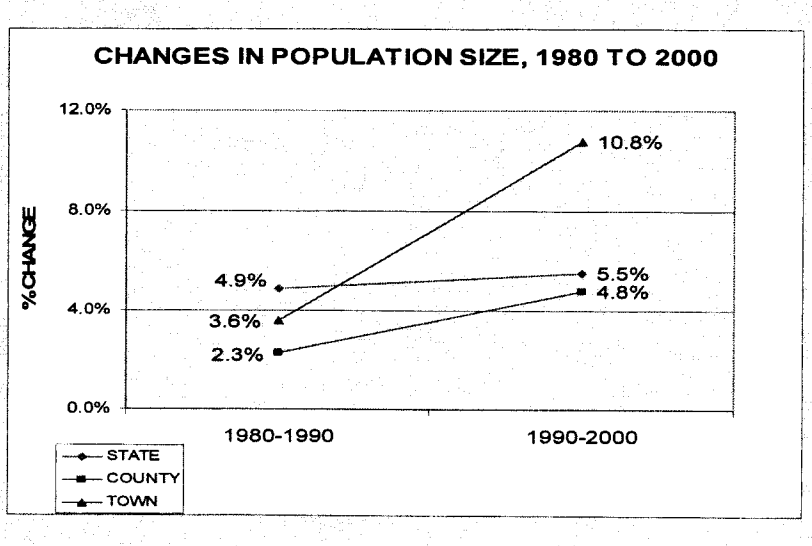


TABLE 1A
STOW POPULATION

	Census	MA DOR
1940	1,243	
1950	1,700	
1960	2,573	
1970	3,984	
1980	5,144	
1990	5,328	
2000	5,902	
2001	6,036	6,039
2002	6,073	6,084
2003	6,136	-

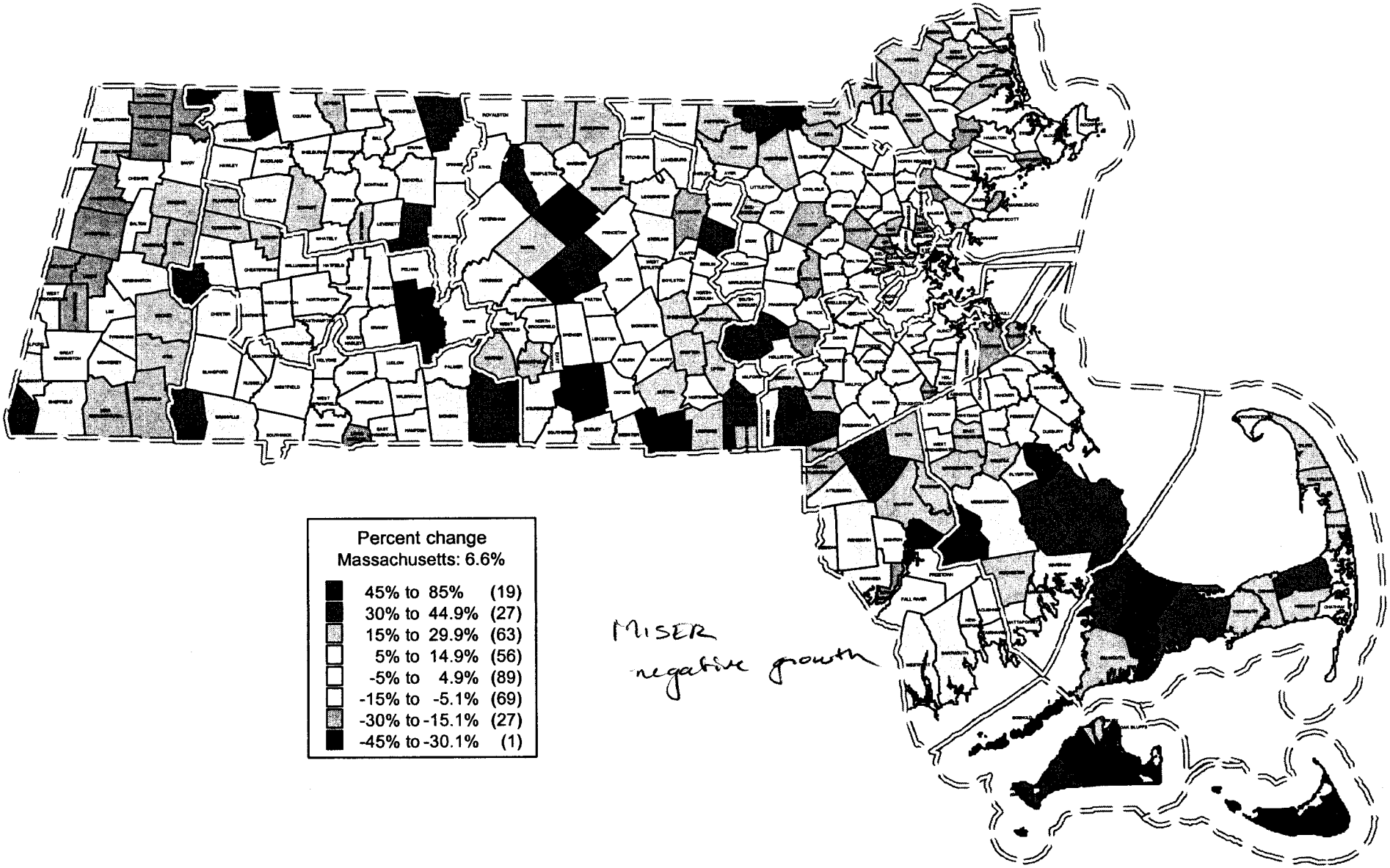
Sources: Bureau of the Census; MA Department of Revenue, Division of Local Services

TABLE 1B
Regional Population Growth 1990 – 2000
(change in persons and percentage)

Littleton +1133 +16.1%	Harvard +1319 +28.3%	Boxborough +1525 +45.6%	Ayer +416 +6.1%
Lancaster +719 +10.8%	Bolton +1855 +32.4%	Acton +2459 +13.8%	Concord -83 -0.5%
Clinton +213 +1.6%	**Stow** **+574** **+10.8%**	Maynard +108 +1%	Lincoln +390 +5.1%
Berlin +87 +3.8%	Hudson +880 +5.1%	Sudbury +2483 +17.3%	Wayland +1226 +10.3%

Source: U. S. Census

Population Change
Census 2000 to 2020 Middle Projection



Produced by MISER. University of Massachusetts at Amherst. Nov 2003

TABLE 2
PERCENTAGE OF POPULATION UNDER THE AGE OF 18 AND MEDIAN AGE

STATE OF MASSACHUSETTS:

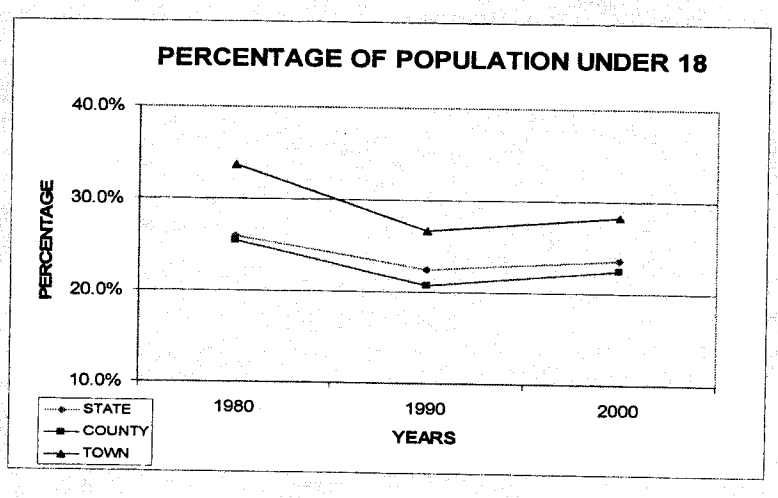
	NO. UNDER 18	% UNDER 18	MEDIAN AGE
1980	1,490,389	26.0%	31.1
1990	1,353,075	22.5%	33.6
2000	1,500,064	23.6%	36.5

MIDDLESEX COUNTY:

	NO. UNDER 18	% UNDER 18	MEDIAN AGE
1980	346,842	25.4%	30.9
1990	290,992	20.8%	33.6
2000	329,073	22.5%	36.4

TOWN OF STOW:

	NO. UNDER 18	% UNDER 18	MEDIAN AGE
1980	1,727	33.6%	31
1990	1,423	26.7%	35.8
2000	1,667	28.2%	38.8



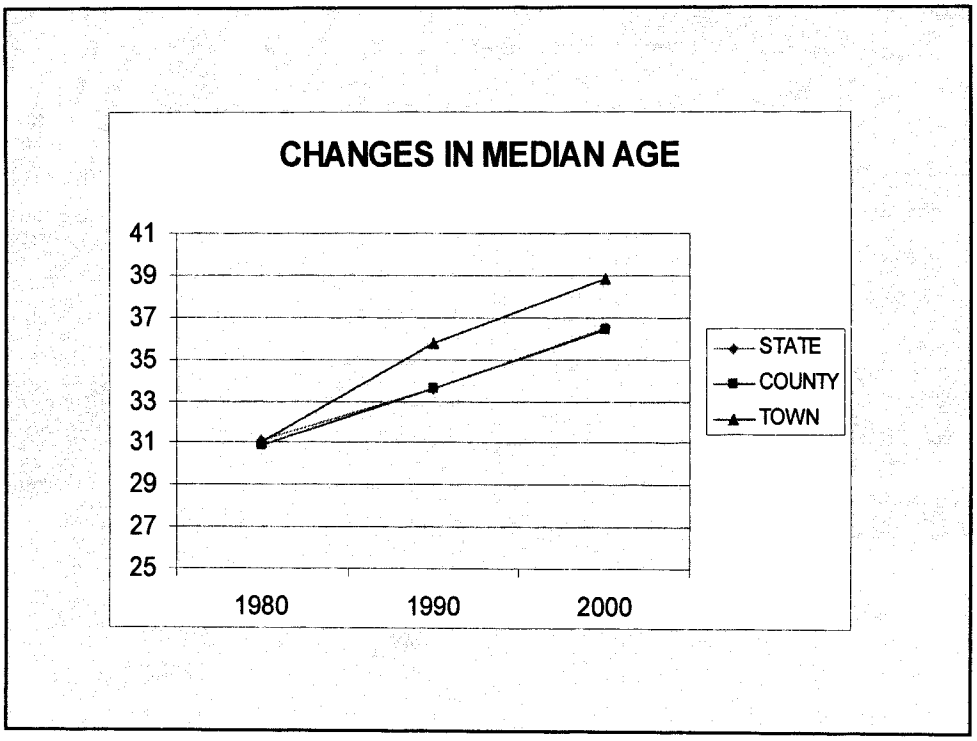
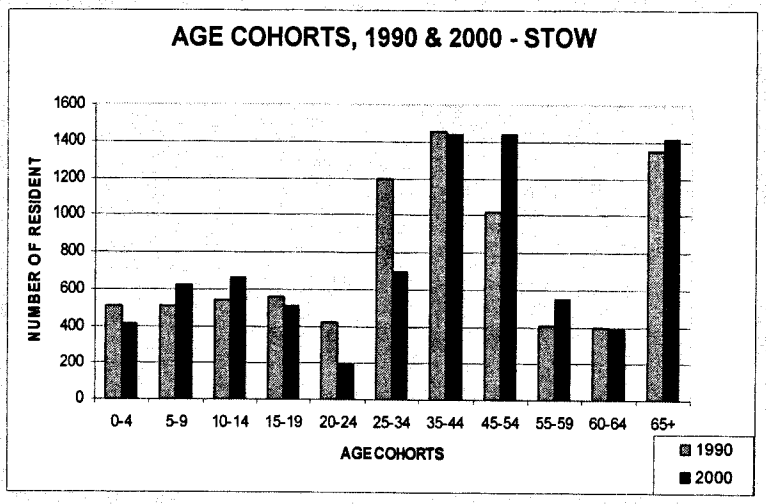

CHANGES IN MEDIAN AGE
41
39
37
35
33
31
29
27
25
1980
1990
2000
STATE
COUNTY
TOWN

TABLE 3
AGE COHORT DATA – STOW, MA

AGE	SIZE OF COHORT			% CHANGE, 1990 TO 2000
	1980	1990	2000	
0-4	348	419	510	21.7%
5-9	449	381	470	23.4%
10-14	559	379	442	16.6%
15-19	521	364	335	-8.0%
20-24	281	300	156	-48.0%
25-34	890	731	575	-21.3%
35-44	923	1124	1230	9.4%
45-54	527	842	1039	23.4%
55-59	184	265	393	48.3%
60-64	130	153	267	74.5%
65+	332	370	485	31.1%
TOTAL:	5,144	5,328	5,902	10.8%



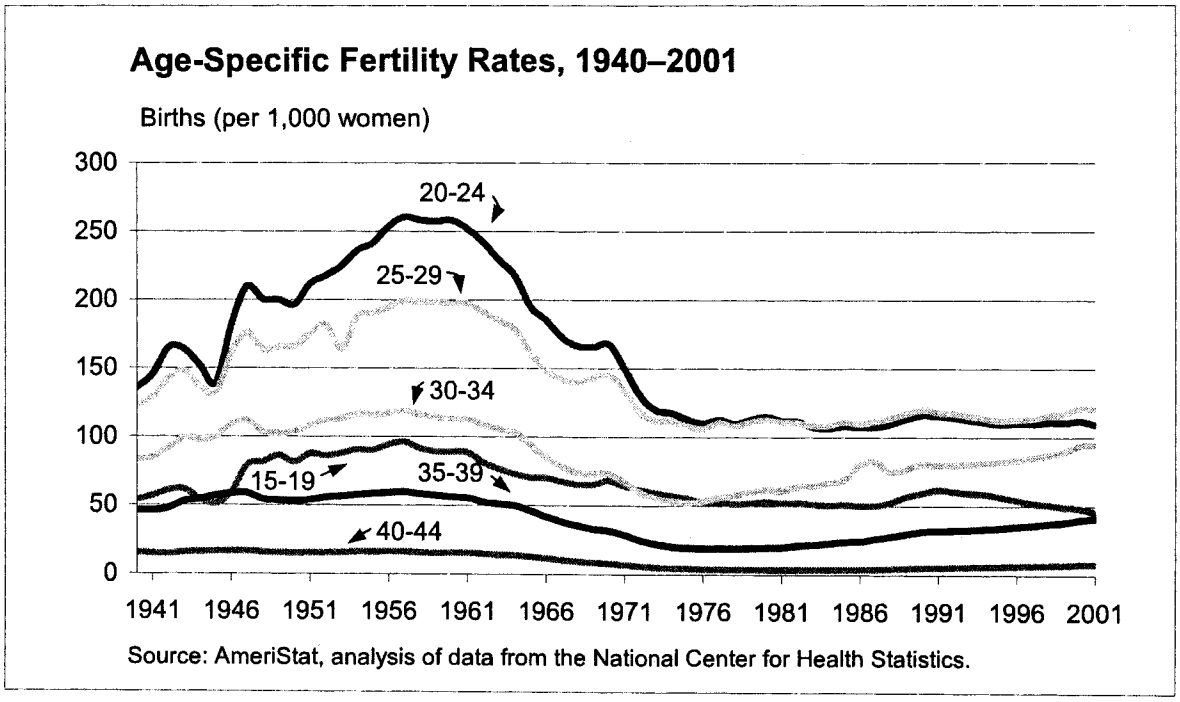


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TABLE 4
PERCENTAGE OF K-12 ENROLLMENT IN POPULATION

STATE OF MASSACHUSETTS:

	POPULATION	PUBLIC K-12 ENROLLMENT	% K-12 ENR. IN POPULATION
1980	5,737,037	999,818	17.4%
1990	6,016,425	828,816	13.8%
2000	6,349,097	959,655	15.1%

TOWN OF STOW:

	POPULATION	PUBLIC K-12* ENROLLMENT	% K-12 ENR. IN POPULATION
1980	5,144	1,251	24.3%
1990	5,328	884	16.6%
2000	5,902	1,027	17.4%

* Students in Stow Public Schools, Nashoba, and Minuteman

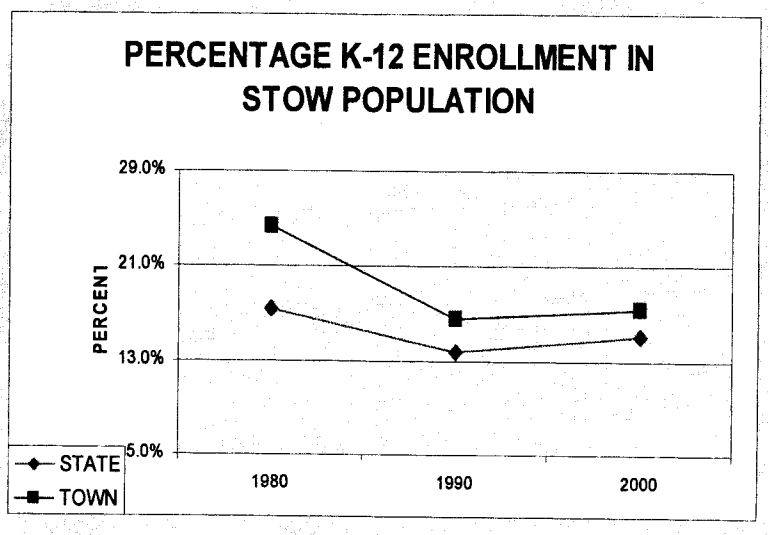


TABLE 5
POPULATION BY RACE AND HISPANIC ORIGIN

STATE OF MASSACHUSETTS:

	WHITE	BLACK	ASIAN	OTHER	% NON-WHITE	HISPANIC ORIGIN (of any race)	% HISPANIC
1980	5,362,836	221,279	49,501	103,421	6.5%	141,043	2.5%
1990	5,405,374	300,130	143,392	167,259	10.2%	287,549	4.8%
2000	5,367,286	343,454	238,124	400,233	15.5%	428,729	6.8%

MIDDLESEX COUNTY:

	WHITE	BLACK	ASIAN	OTHER	% NON-WHITE	HISPANIC ORIGIN (of any race)	% HISPANIC
1980	1,313,206	25,358	15,861	12,609	3.9%	23,537	1.7%
1990	1,287,412	40,236	51,826	18,994	7.9%	47,383	3.4%
2000	1,258,476	49,310	91,685	65,925	14.1%	66,707	4.6%

TOWN OF STOW:

	WHITE	BLACK	ASIAN	OTHER	% NON-WHITE	HISPANIC ORIGIN (of any race)	% HISPANIC
1980	5,065	27	39	13	1.5%	29	0.6%
1990	5,202	12	77	37	2.4%	67	1.3%
2000	5,635	21	120	126	4.5%	84	1.4%

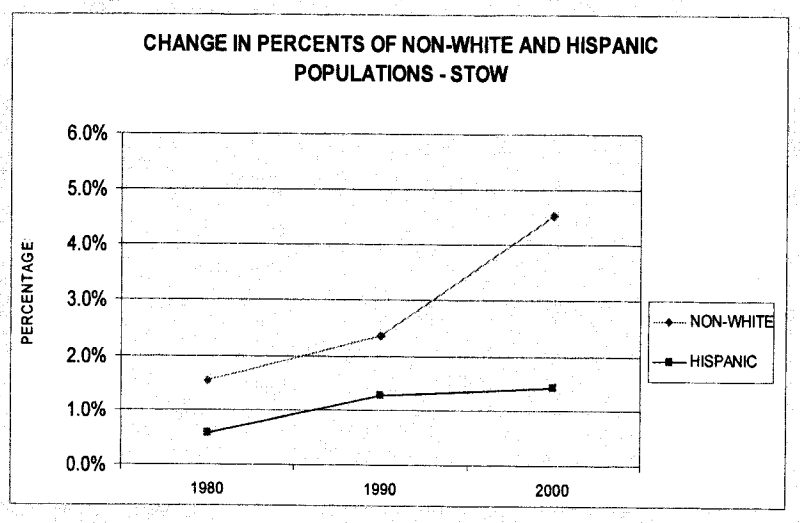


TABLE 6
NUMBER OF DWELLINGS AND PERSONS PER DWELLING UNIT

STATE OF MASSACHUSETTS:

	NO. OF DWELLING UNITS	% CHANGE	PERSONS PER UNIT
1980	2,208,146		2.6
1990	2,472,711	12.0%	2.4
2000	2,621,989	6.0%	2.4

MIDDLESEX COUNTY:

	NO. OF DWELLING UNITS	% CHANGE	PERSONS PER UNIT
1980	492,966		2.8
1990	543,796	10.3%	2.6
2000	576,681	6.0%	2.5

TOWN OF STOW:

	NO. OF DWELLING UNITS*	% CHANGE	PERSONS PER UNIT
1980	1,660		3.1
1990	1,853	11.6%	2.9
2000	2,128	14.8%	2.8

*275 units built in 90's +15 mobile homes replaced=290 units

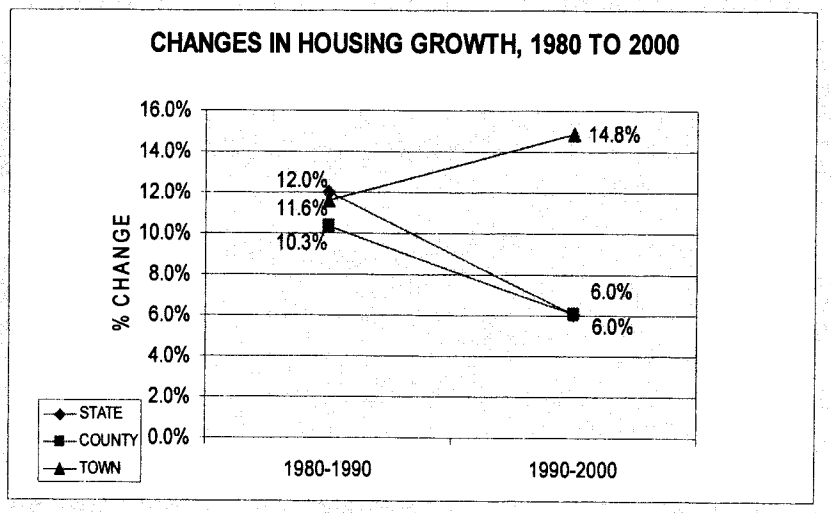


TABLE 6A
STOW HOUSING DETAIL 1990 V. 2000

1990 Dwellings	Occupied	Vacant	2000 Dwellings	Occupied	Vacant
1853	1793	60	2128 *	2082	46
1-unit detached 1690 91%	97% occupied	19 for seasonal use	1-unit detached 1933 91%	98% occupied	20 for seasonal use
1-unit attached 25	87% owner-occupied	4% rental vacancy rate	1-unit attached 53	87% owner-occupied	0.7% rental vacancy rate
2 to 4 units 68	13 renter-occupied		2 to 4 units 100	13% renter-occupied	
5 to 9 units 54			5 to 9 units 42		
10 or more units 1			10 or more units 0		
(15 mobile)			(0 mobile)		

Source: U.S. Census, Tables DP-1, 4

* CPI estimates that town was at 62% of buildout (can add 1319 additional units)

TABLE 6A (continued)
STOW HOUSING DETAIL

YEAR STRUCTURE BUILT		
	Number	Percent
1990's (to 3/2000)	315	15%
1980's	277	13%
1970's	501	23%
1960's	291	14%
1940's/50's	362	17%
Prior to 1940	382	18%
ROOMS (7.7 rooms median)		
1-4 rooms	252	12%
5 rooms	195	9%
6 rooms	266	12%
7 rooms	253	12%
8 rooms	613	29%
9 or more rooms	549	26%
YEAR HOUSEHOLDER MOVED INTO UNIT		
1995 to March 2000	745	35%
1990 to 1994	371	18%
1980 to 1989	351	17%
1970 to 1979	395	19%
1969 or earlier	220	11%

TABLE 6B
STOW BUILDING PERMITS

Year	Permits	Year	Permits
1970	18	1988	5
1971	63	1989	12
1972	51	1990	5 + 10 apt.
1973	80	1991	19
1974	41	1992	28
1975	56	1993	37
1976	41	1994	22
1977	64	1995	27
1978	48	1996	19
1979	30	1997	30
1980	17	1998	34
1981	72	1999	22
1982	75	2000	41
1983	20	2001	28
1984	34	2002	36
1985	25	2003	16
1986	16	2004	34 + 3x4 units
1987	18	2005	8 *

Source: Building Department, Town Reports, and Planning Assistant.

Most permits are for single-family dwellings although condo and multi-family units have not been listed separately; in several years "demolition" permits issued, however these often have been for barns or other accessory buildings...see text

TABLE 6C
2003 MEDIAN PROPERTY SALES
(single-family median above; # sales in paren. condo median sales below)

Littleton $369,500 (150)	Harvard $504,900 (63) $329,200 (C)	Boxborough $549,500 (50) $117,000 (C)	Ayer $250,000 (75) $172,900 (C)
Lancaster $263,500 (94) $229,900 (C)	Bolton $445,000 (55)	Acton $469,275 (229) $182,000 (C)	Concord $659,900 (181) $390,000 (C)
Clinton $224,000 (102) $212,900 (C)	**Stow** **$417,500 (107)** **$227,900 (C)**	Maynard $290,250 (172) $267,500 (C)	Lincoln $975,000 (55) $360,000 (C)
Berlin $293,000 (31) $379,855 (C)	Hudson $293,500 (234) $205,000 (C)	Sudbury $586,250 (294) $195,000 (C)	Wayland $526,200 (187) $565,000 (C)

Source: *Warren Group Banker & Tradesman*

TABLE 6D
2004 MEDIAN PROPERTY SALES
(single-family median above; # sales in paren. condo median sales below)

Littleton $390,000 (152)	Harvard $585,000 (86) $359,950 (C)	Boxborough $530,000 (51) $121,000 (C)	Ayer $272,000 (67) $203,450 (C)
Lancaster $295,000 (99)	Bolton $507,500 (94)	Acton $532,750 (234) $225,000 (C)	Concord $709,563 (190) $405,000 (C)
Clinton $234,500 (100) $242,000 (C)	**Stow** **$435,000 (117)** **$381,425 (C)**	Maynard $330,000 (143) $290,000 (C)	Lincoln $924,750 (60) $385,000 (C)
Berlin $380,000 (39)	Hudson $330,000 (237) $215,000 (C)	Sudbury $635,175 (316) $379,900 (C)	Wayland $567,500 (217) $590,000 (C)

Source: *Warren Group, Banker & Tradesman*

TABLE 6E
STOW PROPERTY = RECENT ASKING PRICES

Single-Family Residences (47)
$200 - $249,900 = 2 properties
$250 - $299,900 = 4 properties
$300 - $399,900 = 3 properties (2 low + 1 high 3's)
$400 - $499,900 = 4 properties (3+1)
$500 - $599,000 = 15 properties (11+4)
$600 - $699,900 = 5 properties (2+3)
$700 - $799,900 = 8 properties (5+3)
$800 - $899,900 = 6 properties (5+1)

Condominiums (0)

Land (various)
.8 acre = $230,000; 1.78 acre = $290,000; 3,78 acre = $300,000

TABLE 7
NUMBER OF K-12 STUDENTS PER DWELLING UNIT

STATE OF MASSACHUSETTS:

	# OF HOUSING UNITS	PUBLIC K-12 ENROLLMENT	K-12 STUDENTS PER UNIT
1980	2,208,146	999,818	0.45
1990	2,472,711	828,816	0.34
2000	2,621,989	959,655	0.37

2000 Number of Households with individuals under 18: 804,940
2000 Percentage of Households with individuals under 18: 32.9%

TOWN OF STOW:

	# OF HOUSING UNITS	PUBLIC K-12 ENROLLMENT	K-12 STUDENTS PER UNIT
1980	1,660	1,251	0.75
1990	1,853	884	0.48
2000	2,128	1,027	0.48

2000 Number of Households with individuals under 18: 896
2000 Percentage of Households with individuals under 18: 43.0%

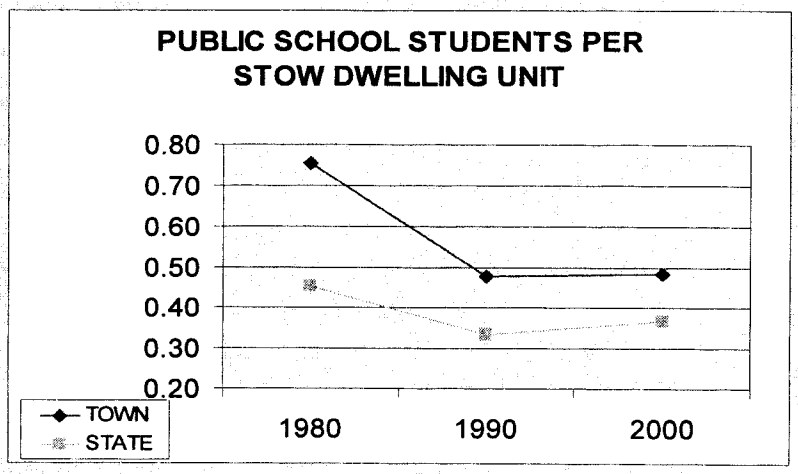


TABLE 8
LIVE BIRTHS TO RESIDENTS OF STOW

YEAR	# OF BIRTHS	AVERAGE	% CHANGE
1989	76		
1990	80		
1991	71	76	
1992	82		
1993	69		14.3%
1994	84		
1995	78		
1996	87	86	
1997	90		
1998	93		-3.5%
1999	95		
2000	88		
2001	78	83	
2002	83		
2003	73		

Source: MA Department of Public Health

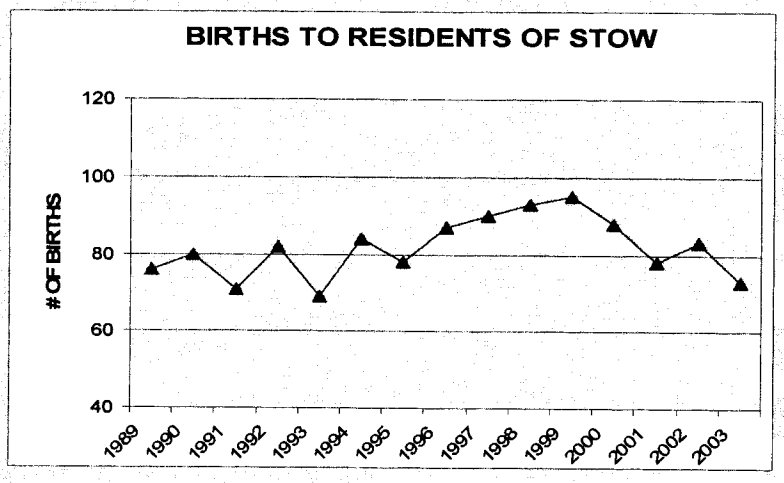


TABLE 8A
STOW BIRTHS

	Local Births*	DPH	Non-Local
1994	74	84	10
1995	73	78	5
1996	83	87	4
1997	83	90	7
1998	87	93	6
1999	91	95	4
2000	84	88	4
2001	75	78	3
2002	68	83	15
2003	72	73	1
2004	88	n/a	n/a

Average 5.9

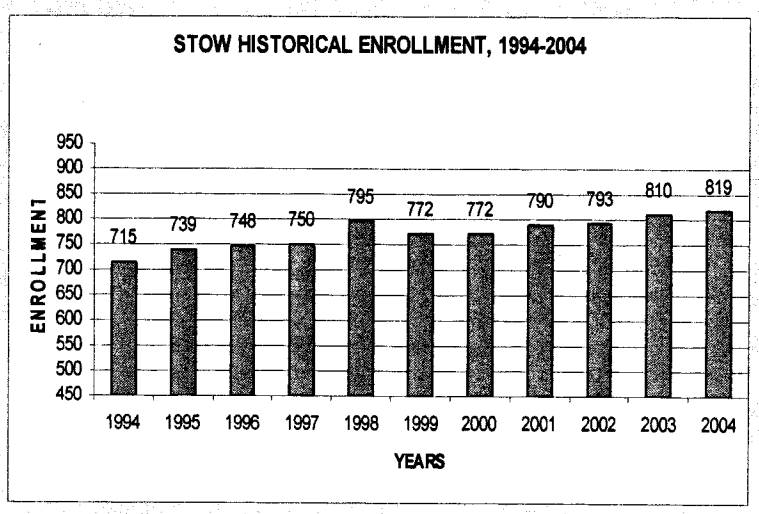
*Local births are recorded by Town Clerk in Town Reports; MA DPH receives non-local and out-of-state births to residents of Stow; 2004 births will be reported by MA DPH in spring/summer 2006

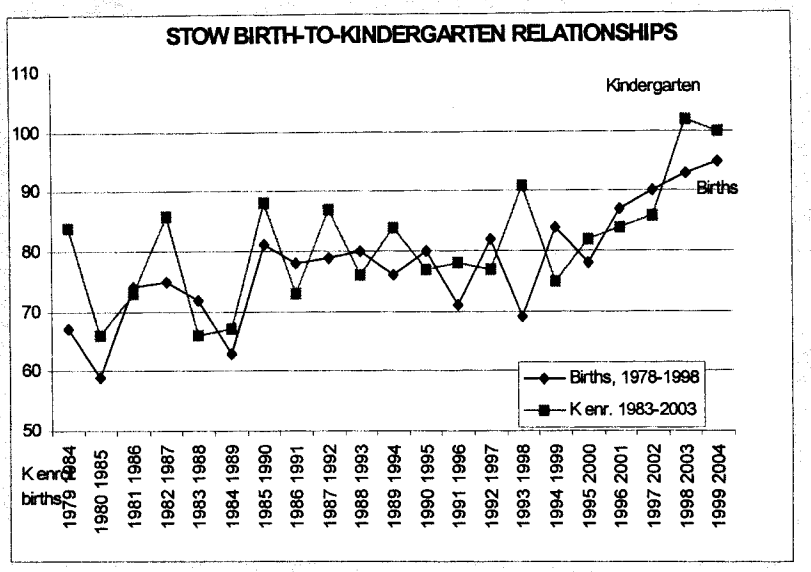
TABLE 9
STOW PK-8 HISTORICAL ENROLLMENTS, 1994-2004

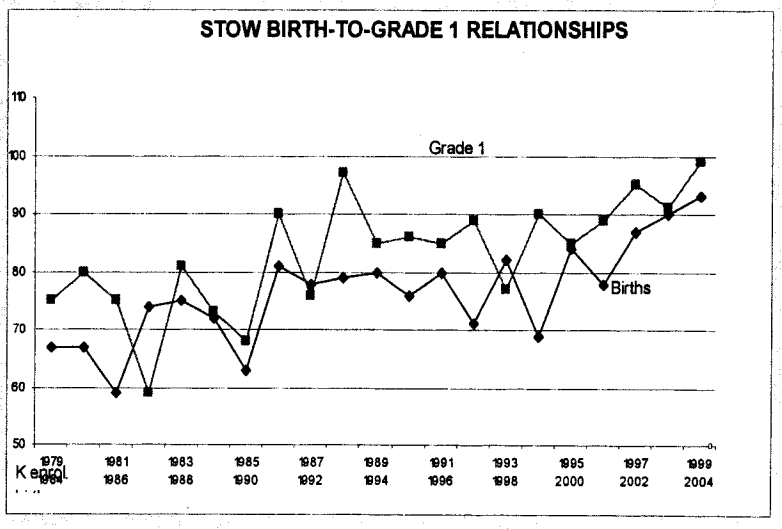
SCHOOL YEAR	Pre-K	K	1	2	3	4	5	6	7	8	K-8 TOTAL	PK-8 TOTAL
1994-95		84	85	97	84	89	69	70	75	62	715	715
1995-96		77	86	82	96	84	90	72	75	77	739	739
1996-97	5	78	85	97	83	88	68	90	81	78	748	753
1997-98	10	77	89	82	85	92	82	81	91	71	750	760
1998-99	7	91	77	84	89	87	93	92	90	92	795	802
1999-00		75	90	71	96	92	85	76	95	92	772	772
2000-01		82	85	87	72	98	91	88	80	89	772	772
2001-02		84	89	87	87	78	97	97	85	86	790	790
2002-03	19	86	95	90	84	103	73	75	101	86	793	812
2003-04	31	102	91	87	85	86	85	93	78	103	810	841
2004-05	24	100	99	90	87	89	86	89	99	80	819	843

TABLE 10
HISTORICAL ENROLLMENTS IN GRADE COMBINATIONS

SCHOOL YEAR	K-2	3-5	K-5	K-8	5-8	6-8	7-8
1994-95	266	242	508	715	276	207	137
1995-96	245	270	515	739	314	224	152
1996-97	260	239	499	748	317	249	159
1997-98	248	259	507	750	325	243	162
1998-99	252	269	521	795	367	274	182
1999-00	236	273	509	772	348	263	187
2000-01	254	261	515	772	348	257	169
2001-02	260	262	522	790	365	268	171
2002-03	271	260	531	793	335	262	187
2003-04	280	256	536	810	369	274	181
2004-05	289	262	551	819	354	268	179




STOW BIRTH-TO-KINDERGARTEN RELATIONSHIPS
Kindergarten
Births
Births, 1978-1998
K enr. 1983-2003
110
100
90
80
70
60
50
K enr.
births
1979 1984
1980 1985
1981 1986
1982 1987
1983 1988
1984 1989
1985 1990
1986 1991
1987 1992
1988 1993
1989 1994
1990 1995
1991 1996
1992 1997
1993 1998
1994 1999
1995 2000
1996 2001
1997 2002
1998 2003
1999 2004


STOW BIRTH-TO-GRADE 1 RELATIONSHIPS
Grade 1
Births
110
100
90
80
70
60
50
1979 1984
1981 1986
1983 1988
1985 1990
1987 1992
1989 1994
1991 1996
1993 1998
1995 2000
1997 2002
1999 2004

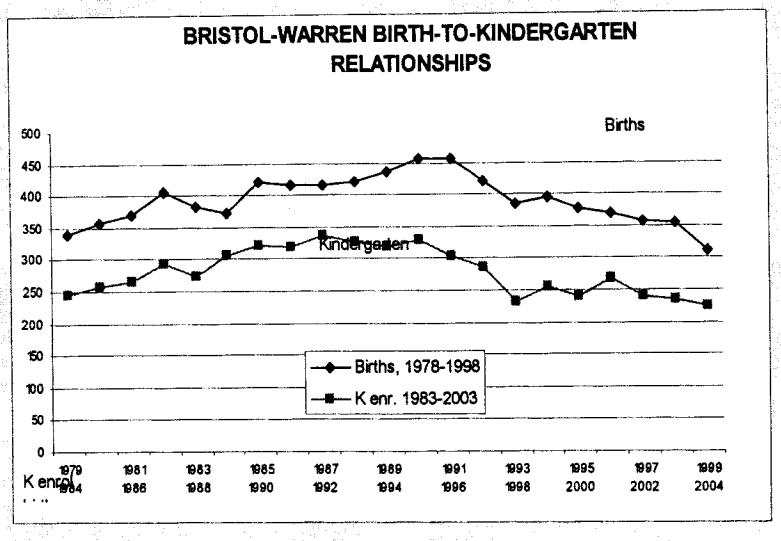

BRISTOL-WARREN BIRTH-TO-KINDERGARTEN RELATIONSHIPS
Births
Kindergarten
Births, 1978-1998
K enr. 1983-2003
500
450
400
350
300
250
200
150
100
50
0
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004

TABLE 11
MISER STABILITY INDEX*

	Grades 2 - 4	Grades 3 - 5	Stability Index*
1994-95	270	-	-
1995-96	262	270	100.0%
1996-97	268	239	91.2%
1997-98	259	259	96.6%
1998-99	260	269	103.8%
1999-00	259	273	105.0%
2000-01	257	261	100.7%
2001-02	252	262	101.9%
2002-03	277	260	103.1%
2003-04	258	256	92.4%
2004-05	-	262	101.6%

*MISER=Massachusetts Institute for Social and Economic Research, UMass-Amherst; same cohort of students compared over two school years; Stability Index greater than 100% indicates net in-migration

TABLE 12
SURVEY OF STOW RESIDENTS IN PRIVATE AND PAROCHIAL SCHOOLS

	Grades 1-5	6-8	9-12	Total
1993-94	8	9	14	31
1994-95	16	23	28	67
1995-96	21	15	10	46
1996-97	16	11	26	53
1997-98	18	14	15	47
1998-99	16	9	19	44
1999-00	21	9	32	62
2000-01	15	6	36	57
2001-02	12	7	51	70
2002-03	12	10	53	75
2003-04	27	15	51	93
2004-05	25	6	16	47

Source: MA Department of Education, based upon commendable survey by District; may be incomplete; does not include Special Education

TABLE 13
NASHOBA REGIONAL HIGH SCHOOL
HISTORY OF STOW IN CLASS OF 2005

1987 Stow Births - 79

Year	Grade	Stow/Nashoba Public Schools
1992-93	Kindergarten	87
1993-94	Grade 1	97
1994-95	Grade 2	97
1995-96	Grade 3	96
1996-97	Grade 4	92
1997-98	Grade 5	93
1998-99	Grade 6	93
1999-00	Grade 7	93
2000-01	Grade 8	90
2001-02	Grade 9	70 + 14 voc
2002-03	Grade 10	68 + 14 voc
2003-04	Grade 11	68 + 13 voc
2004-05	Grade 12	65 + 13 voc

ASSUMPTIONS FOR PK-8 PROJECTIONS WITHOUT IMPACT OF INCREASED DEVELOPMENT

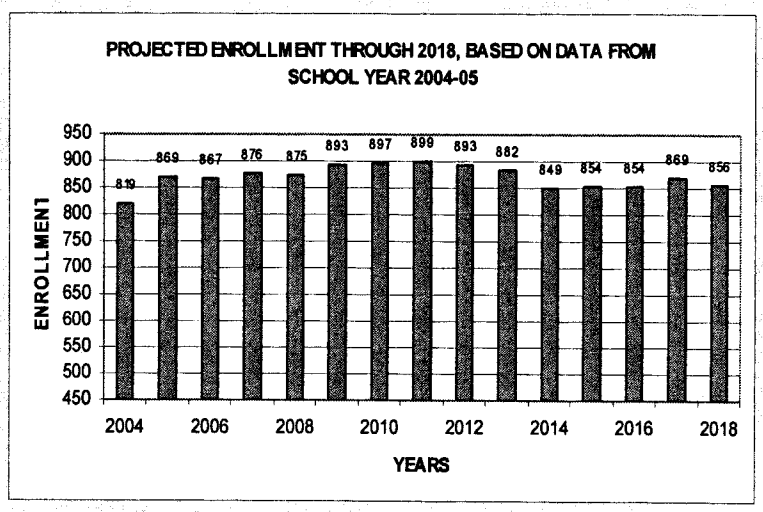
- Annual number of births to residents will level off at about 81-88 per year
- Housing growth over the next ten years will continue to be the same rate as the recent past (27-33 units per year...see "Capacity for Additional Growth" in text)
- Turnover of existing housing stock and rentals will continue at same pace as recent years (about 105-120 new households/year)
- Kindergarten registration will continue at 106% of births (5 years previous); class will grow 5% in Grade 1 and about 10% (total) through Grade 8
- Residents in charter schools, non-public schools, and in home-schooling (currently 7) will continue at present levels

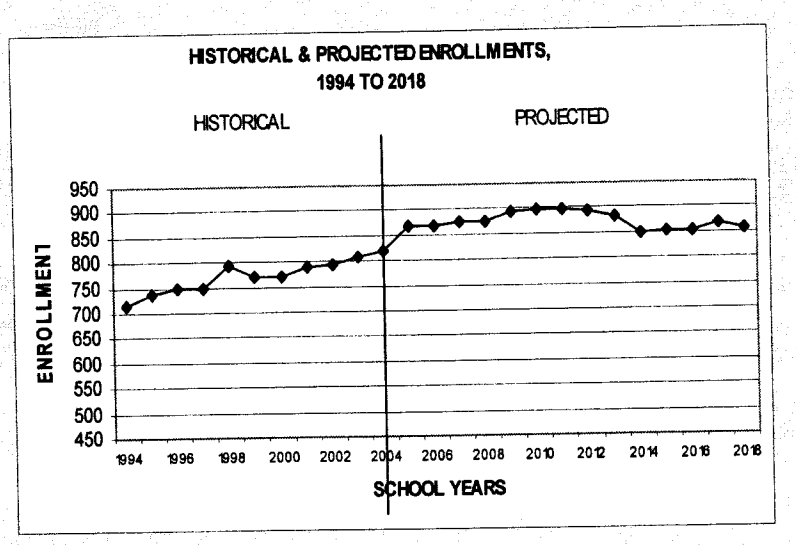
TABLE 14
STOW PK-8 PROJECTED ENROLLMENTS, 2005-2018 WITHOUT IMPACT OF ADDITIONAL DEVELOPMENT

SCHOOL YEAR	Pre-K	K	1	2	3	4	5	6	7	8	K-8 TOTAL	PK-8 TOTAL
2004-05	24	100	99	90	87	89	86	89	99	80	819	843
2005-06	28	115	105	98	90	90	88	89	93	101	869	897
2006-07	24	83	121	103	98	93	89	92	93	95	867	891
2007-08	26	88	87	119	104	101	92	93	97	95	876	902
2008-09	23	77	92	86	120	107	100	96	98	99	875	898
2009-10	26	100	81	91	86	124	106	104	101	100	893	919
2010-11	27	88	105	80	91	89	122	110	109	103	897	924
2011-12	28	89	92	103	80	94	88	127	115	111	899	927
2012-13	29	88	93	91	104	82	93	92	133	117	893	922
2013-14	30	89	92	92	91	107	81	97	97	136	882	912
2014-15	31	88	93	91	92	94	106	84	102	99	849	880
2015-16	32	89	92	92	91	95	93	110	88	104	854	886
2016-17	33	88	93	91	92	94	94	97	115	90	854	887
2017-18	34	89	92	92	91	95	93	98	102	117	869	903
2018-19	35	88	93	91	92	94	94	97	103	104	856	891

TABLE 15
PROJECTED PK-8 ENROLLMENTS, GRADE COMBINATIONS WITHOUT IMPACT OF ADDITIONAL DEVELOPMENT

SCHOOL YEAR	K-2	3-5	K-5	K-8	5-8	6-8	7-8
2004-05	289	262	551	819	354	268	179
2005-06	318	268	586	869	371	283	194
2006-07	307	280	587	867	369	280	188
2007-08	294	297	591	876	377	285	192
2008-09	255	327	582	875	393	293	197
2009-10	272	316	588	893	411	305	201
2010-11	273	302	575	897	444	322	212
2011-12	284	262	546	899	441	353	226
2012-13	272	279	551	893	435	342	250
2013-14	273	279	552	882	411	330	233
2014-15	272	292	564	849	391	285	201
2015-16	273	279	552	854	395	302	192
2016-17	272	280	552	854	396	302	205
2017-18	273	279	552	869	410	317	219
2018-19	272	280	552	856	398	304	207




HISTORICAL & PROJECTED ENROLLMENTS,
1994 TO 2018
HISTORICAL
PROJECTED
ENROLLMENT
950
900
850
800
750
700
650
600
550
500
450
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
SCHOOL YEARS

ASSUMPTIONS INCLUDING IMPACT OF ADDITIONAL DEVELOPMENT (See Table 16 below)

- Pace of development (recently about 30 dwellings per year) appears to be increasing
- As in other communities, the school-age children in "Dawes Property" (Fox/Woodpecker/Cardinal/Cricket Court, Wildlife/Whispering Way, Salamander Lane) are substantial...may occur in Cranberry Circle, Meadowbrook, etc.
- Census 2000 enumerated 45% increase in residents age 55 and above (currently 60 and above), indicating increased potential for property to come on the market due to "downsizing"
- 15-20% of persons moving to age-restricted housing are likely to be Stow residents (causing additional property turnover)
- Recent Town Census reveals in-migration of pre-school children (103 children born in 2000 v. 88 Stow births in 2000; 94 children born in 2001 v. 78 Stow births in 2001)

ASSUMPTIONS INCLUDING IMPACT OF ADDITIONAL DEVELOPMENT (See Table 16 below)

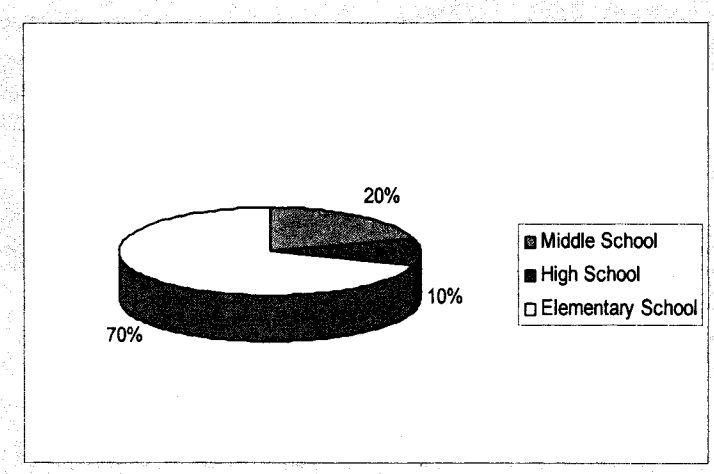
- Census 2000 enumerated .48 K-12 students per dwelling v. .75 K-12 students per dwelling in 1980...ratio may again rise
- Rapidly escalating prices in the Route 128 area are causing additional migration to Metrowest
- These and other factors could combine to add <u>20 additional PK-12 students per year, not included in Tables 14 and 15</u> beginning in 2007...see Table 16 below
- These additional students are likely to be distributed 70% in elementary grades, 20% middle grades, and 10% in high school... 14 additional elementary, 4 middle, 2 high school each year

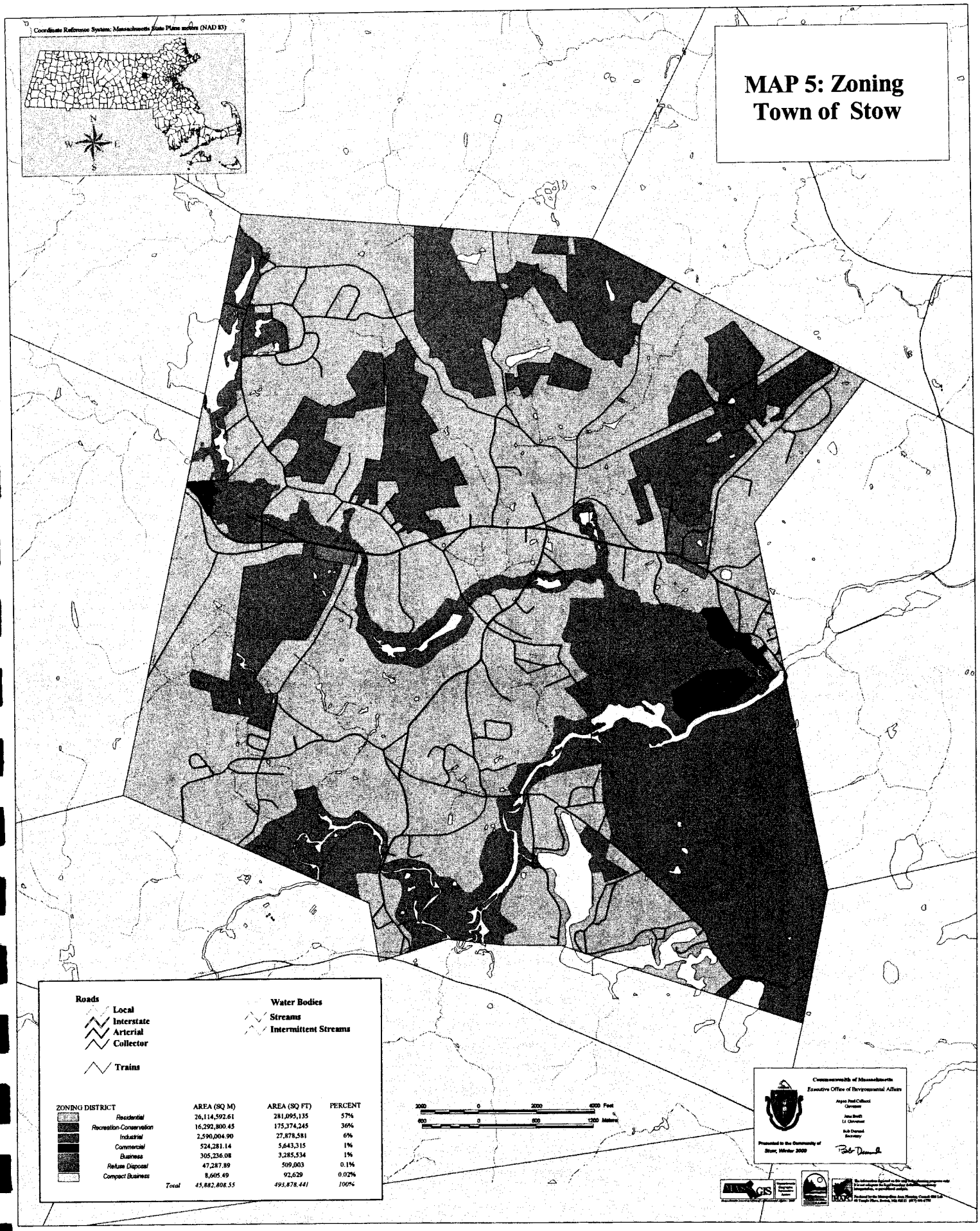
TABLE 16
WITHOUT / WITH IMPACT OF ADDITIONAL DEVELOPMENT

SCHOOL YEAR	Without Impact K-8		With Impact K-8
2004-05	819		819
2005-06	869		869
2006-07	867		867
2007-08	876		896
2008-09	875		915
2009-10	893		953
2010-11	897		977
2011-12	899		999
2012-13	893		1013
2013-14	882		1022
2014-15	849		1009
2015-16	854		1034
2016-17	854		1034
2017-18	869		1049
2018-19	856		1036

TYPICAL STUDENT ENROLLMENTS IN INITIAL YEARS OF NEW OCCUPANCY – OWNERSHIP

(distribution in rental situations often is 60% elem; 20%MS; 20% HS)





ZONING DISTRICT	AREA (SQ M)	AREA (SQ FT)	PERCENT
Residential	26,114,592.61	281,095,135	57%
Recreation-Conservation	16,292,800.45	175,374,245	36%
Industrial	2,590,004.90	27,878,581	6%
Commercial	524,281.14	5,643,315	1%
Business	305,236.08	3,285,534	1%
Refuse Disposal	47,287.89	509,003	0.1%
Compact Business	8,605.49	92,629	0.02%
Total	45,882,808.55	493,878,441	100%

MAP 2: Developable Lands and Partial Constraints
Town of Stow

Coordinate Reference System: Massachusetts State Plane meters (NAD 83)

100' - 200' Rivers Protection Buffer

Potential Constraint
Water Resource Protection District

Water Bodies
Streams
Intermittent Streams

Roads
Local
Interstate
Arterial
Collector

Trains

BOXBOROUGH
HARVARD
ACTON
MAYNARD
BOLTON
MAYNARD
HUDSON

Multipliers Used in Residential Calculations

Residential Zoning	Minimum Lot Size	Frontage	R.O.W.	Build Factor
RES	65,340	200	50	83%

Town of Stow 11/02/01

	Undeveloped Land (sq.ft.)	Lots	Dwelling Units	Effective FAR	Industrial Commercial Impacting Sq. Ft.	Commercial Industrial Water Use	Future Residents	Residential Water Use (GPD)	Undeveloped Land Water Source	Residentially Water Source	Sewerage	Excess Land Capacity
Residential Districts												
Total Upland Area	104,445,402	1,000	1,000				3,000	300,000	1000	1000	400	2000
Sum of > 10'000 Sewer Zone	19,779,600	1,295	1,295				7,817	779,700	1,811	1,111	481	2049
Sum of > 100'000 Sewer Zone	2,211,504	24	24				66.96	1,000	34	34	17	154
Business Districts												
Total Upland Area	638,386					63,700	6,201					
Sum of > 10'000 Sewer Zone	140,394					3,700	597					
Average > 10'000 Sewer Zone	140,394			0.40		3,700	597					
Adjusted > 10'000 Sewer Zone				0.61								
Total > 100'000 Sewer Area	348,136					63,900	6,149					
Average > 100'000 Sewer Zone	348,136			0.27		63,900	6,149					
Sum of > 100'000 Sewer Zone				0.17								
Commercial Districts						996,100	20,245					
Total Upland Area	4,000,917					114,170	4,160					
Sum of > 10'000 Sewer Zone	3,244,594					114,170	4,160					
Average > 10'000 Sewer Zone	47,183			0.0021		1,977	170					
Average > 100'000 Sewer Zone	1,041,722					934,000	31,500					
Sum of > 100'000 Sewer Zone	1,478,394			0.30		991,127	35,155					
Average > 100'000 Sewer Zone	1,41,394			0.18		32,171	2,166					
Industrial Districts												
Total Upland Area	10,606,707					3,600,300	140,000					
Sum of > 10'000 Sewer Zone	1,472,111					17,979	14,130					
Average > 10'000 Sewer Zone	7,441,011			0.04		102,177	13,133					
Sum of > 100'000 Sewer Zone	108,350			0.43		13,000	933					
Average > 100'000 Sewer Zone	11,110,600					2,900,000	140,422					
Sum of > 100'000 Sewer Zone	9,985,675			0.24		2,144,320	175,233					
Sum of > 100'000 Sewer Zone	300,315			0.18		110,000	7,198					
Grand Totals	134,438,440	1,343	1,343		3,600,300	3,910,647	2,600	379,900	1,000	1,146	498	30

NOTES

1 Land Area Data is a GIS Verification of the Sewer Projects. Any representations of Subject to or directed contrast
2 Wetlands (1,000 ft.) Development Constraints Sewer Projects are not considered within the 10 distance as specified in Section 3.1
3 The Water Protection Environmental Constraints Sewer Projects
4 The Industrial Use pulp/fibrinoxidation is not taken into account relatively 21%
5 All Industrial Sewer Projects are not considered in Grand Totals
6 The Cowpond Subsewer District was determined to be full use
7 Within the Business Sewer Projects are considered for 10% (Reserved and MBCI Sewer office
8 Within the Industrial Sewer Projects are considered for 21% (Reserved and 27% Sewer office
9 Within the Industrial Sewer Projects are considered for 10% (Sewer Sewer office and 21% (Reserved Industrial
10 Within the Industrial Sewer Projects are considered for 10% (Sewer Sewer office and 21% (Reserved Industrial
11 Within the Business, Industrial, Commercial Land are considered Water Resource Protection District
12 Residential Sewer Projects are considered for 100
13 Multiplier Residential Sewer Projects are considered for 0 / 1 and 0.2 Sewer or Non-Sewer based Sewer office residential development

2000 0 2000 4000 Feet
600 0 600 1200 Meters

Commonwealth of Massachusetts
Executive Office of Environmental Affairs

Argeo Paul Cellucci
Governor

Jane Swift
Lt. Governor

Bob Durand
Secretary

Presented to the Community of
Stow, Winter 2000

Map revised 11/02/01

PROGRAM CHANGES = DECREASED BUILDING CAPACITY

ELEMENTARY:	THEN	NOW
Classrooms	500-600 sq. ft. Desks in rows, no water	1000 sq. ft., learning centers, in-class library, sink & drinking fountain in room (prim. Gr. toilets)
Kindergarten	None, or Half-day, in standard classroom	Full-day, 1200 + sq. ft. toilets sink & drinking fountain, etc.; some preschool
Technology	None	In classrooms and Comp. Lab
Science	In classroom	Separate Science Room
Art/Music	In classroom	Separate Art/Music Rooms; 1200-1500 sq. ft., spec. equip.
Library	Depository for books	Books, computers, media major curr. support; Lib. Sci. instruction

See Rothstein, Richard, *The Way We Were? The Myths and Realities of America's Student Achievement* (2003); Castaldi, Basil *Educational Facilities 4th edition*(1993); Conrad, Marion *Educational Programs and School Capacity* (1952 Ohio-State University doctoral dissertation)

ELEMENTARY:	THEN	NOW
Special Education	Possibly separate classroom, few students in school	Included in regular classes, plus many small instruction rooms; parent conferences required
Handicapped-Accessibility	Little or no accommodations were made	All areas of the school must be handicapped-accessible
Transportation	Some bussed, but most children walked or rode bicycles to school	Most children ride buses or are driven to school
Security	Buildings unlocked; not a major concern	Schools are secured; outside phones for parent and emergency calls
Storage	Little needed	Schools use many educational materials; space required

GRADES 7-8: THEN	GRADES 6-8: NOW
Jr. High Departments, Students move throughout building	MS Teams, Students remain in home base wing for most classes
500-600 sq. ft. classrooms	900-1000 sq. ft. student projects, In-class computers/library
Science Labs in one area	Lab in each team area
SPED in separate room, few students	Included in regular classes, small instruction rooms, parent conferences required
Library a depository for books	Books plus computers and other media; major curric. support; Lib. Sci. instruction