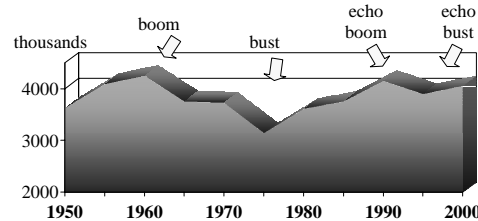


Enrollment Projection Methodologies

Introduction

Tracing the landscape of the country's public school enrollment back over the past fifty years reveals demographic, economic, and social changes. The United States as a whole continues to undergo major shifts in public student enrollment, due in large part to past events including the baby boom, the availability and use of birth control, and the development of suburbs. The baby boom of the late 1940s and 50s was followed by the baby bust of the 1960s and 70s. This gave rise to the echo baby boom of the 1980s, producing children who are in high school currently or are recent graduates.

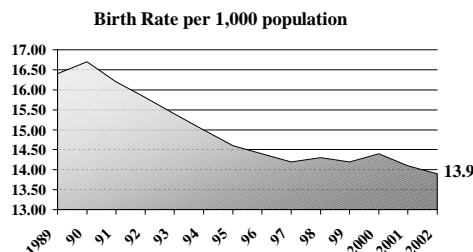
U.S. LIVE BIRTHS 1950-2000



Source: National Vital Statistics Reports, Vol. 52, No. 10, Dec. 17, 2003.

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U.S. POPULATION



The U.S. birth rate increased in 1998 for the first time in almost 10 years. In 2000, the birth rate rebounded to levels seen in 1996, but fell again in both 2001 and 2002. The 2002 birth rate of 13.9 is the lowest ever recorded.

Source: National Vital Statistics Reports, Vol. 52, No. 10, Dec. 17, 2003.

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Nationwide, districts are experiencing the effects of the echo baby bust of the 1990s. From the 1950s to the 1970s, a dramatic downsizing of the family unit occurred. A direct result was the declining school enrollment of the 1970s and 1980s. As of the 2000 Census, the size of a family was at an all-time low of 3.14 persons and is expected to experience further decline. Within the next ten years, the Current Population Report indicates that the average family size could be 3.05 persons per household. At the same time, new housing is being developed and the live birth rate

increasing for the first time in several years in 1998 and increasing again in 2000. However, the birth rate resumed a descending pattern in 2001 and reached an all-time low of 13.9 in 2002. When projecting future enrollments, it will be vital to track the number of live births, the amount of new housing activity, and the change in household composition. In addition, any of the following factors could cause a significant change in projected student enrollments:

- Boundary adjustments
- New school openings
- Changes/additions in program offerings
- Preschool programs
- Change in grade configuration
- Interest rates/unemployment shifts
- Magnet/Charter/Private school opening or closure
- Zoning changes
- Unplanned new housing activity
- Planned, but not built, housing

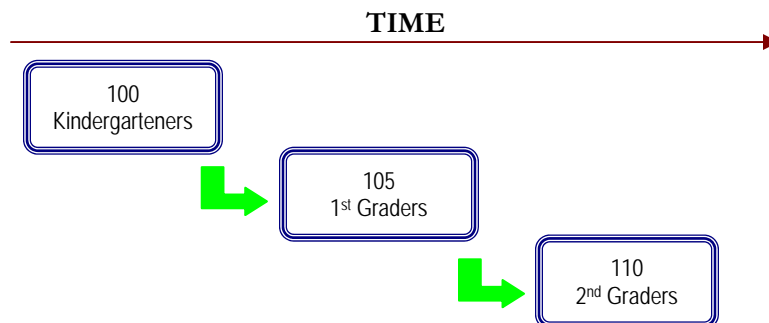
Obviously, certain factors can be gauged and planned for far better than others. For instance, it may be relatively straightforward to gather housing data from local builders regarding the total number of lots in a planned subdivision and calculate the potential student yield. However, planning for changes in the unemployment rate, and how these may either boost or reduce public school enrollment, proves more difficult. In any case, it is essential to gather a wide variety of information in preparation for producing enrollment projections.

When looking ahead at a school district's enrollment over the next two, five, or ten years, it is helpful to approach the process from a global perspective. For example: How many new homes have been constructed each year? How many births have occurred each year in relation to the resident population? Is housing experiencing a turnover – if so, what is the composition of families moving in/out? Are more or fewer students attending private school or being home-schooled? What has the unemployment rate trend been over the past ten years? What new educational policies are in place now that could affect student enrollment figures?

The data sets generated from questions such as these have led to the development of five general methodologies to project future student enrollments. They are as follows:

Cohort Survival Method

A cohort is a group of persons [in this case, students]. The cohort survival projection methodology uses historic live birth data and historic student enrollments to “age” a known population or cohort throughout the school grades. For instance, a cohort begins when a group of kindergarteners enrolls in grade K and moves to first grade the following year, second grade the next year, and so on.



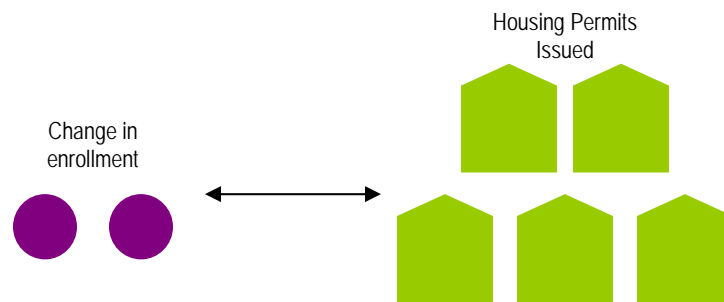
A “survival ratio” is developed to track how this group of students grew or shrunk in number as they moved through the grade levels. By developing survival ratios for each grade transition [i.e. 2nd to 3rd grade] over a ten-year period of time, patterns emerge and can be folded into projections by using the survival ratios as a multiplier.

For example, if student enrollment has consistently increased from the 8th to the 9th grade over the past ten years, the survival ratio would be greater than 100% and could be multiplied by the current 8th grade to develop a projection for next year's 9th grade. This methodology can be carried through to develop ten years of projection figures. Because there is not a grade cohort to follow for students coming into kindergarten, live birth rates are used to develop a survival ratio. Babies born five years previous to the kindergarten class are compared in number, and a ratio can be developed to project future kindergarten enrollments.

The cohort survival method is useful in areas where population is stable [relatively flat, growing steadily, or declining steadily], and where there have been no significant fluctuations in enrollment, births, and housing patterns from year to year.

Housing

Enrollment projections can also be determined by analyzing the housing data for the areas that make up a school district. Yield factors can be established by comparing the historic change in enrollment from year to year divided by the total number of building or occupancy permits issued. For example, if student enrollment has increased by approximately 100 students each year and approximately 200 building permits have been issued each year for the past ten years, then the yield factor would be approximately .5 students per building permit.



Once yield factors are established, the number of new students per year can be estimated by multiplying the yield factor by the number of projected new housing units. This method is effective when the rate of student enrollment far exceeds the live birth rate.

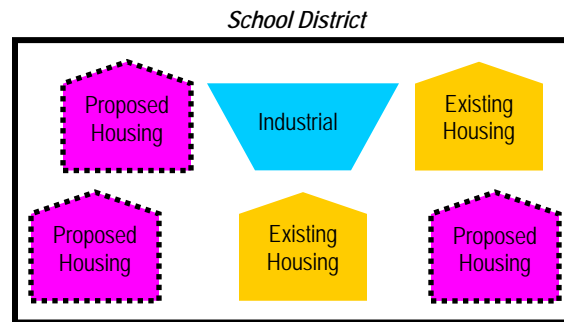
If housing demolitions are occurring in a district, these must also be taken into account. For instance, if housing demolitions/withdrawals have increased rapidly over recent years while new housing starts have remained relatively constant over many years, the conclusion may be that some of the new housing starts will simply be replacements for the families displaced by the demolitions. Of course, housing value and household composition would need to be further analyzed to confirm that this is indeed the case. It is possible that enrollment may remain flat or even decline although there is new housing occurring in the area.

Regression-Based Forecasting Methods

There are several regression-based forecasting methods that may be used in conjunction with the cohort survival method to increase the accuracy of enrollment projections. In regression-based forecasting, it is useful to determine which variables are affecting the district enrollment history and use these variables in the regression calculation. For example, it may be beneficial to study the neighborhoods to determine if they are growing, stable, or declining in number of school-age children, as well as examine live birth rates, building and occupancy permits, transportation plans, and land use plans. Depending upon which environmental variables are used, a "line of best fit" is determined historically, and then projected into the future.

Land-Saturation Analysis

Housing data also drives the land-saturation analysis enrollment methodology. In areas where there is a high rate of development and the future development patterns in the area are clear, a “build-out” scenario can be developed. The scenario takes into consideration the remaining acreage to be developed, planned rate of completion, zoning policies, density per acre, type of housing, and ratios of school-age children per household type. This method is particularly useful in areas experiencing rapid growth.



Migration/Change in Household Composition

The change in household composition over time is one of the most difficult factors to predict. Neighborhoods often go through cycles of newer homes housing younger families. As the families remain in the neighborhood, students become older and eventually the home becomes an “empty nest.” At some point, the housing unit is sold and a new family moves into the home. As simple as it may seem, it is extremely complex to track the turnover of housing units.

Geographic Information Systems

The need for better tools and easier manipulation of data has led to a new industry standard in planning – GIS [Geographic Information Systems]. GIS technology allows school districts to quickly analyze countless data sets including birth data, housing information, and enrollment statistics. When paired with enrollment projections, GIS becomes an invaluable information-management and decision-making tool. For example, because data can be displayed visually, issues such as where new facilities should be located and how neighborhood schools affect the district become much more clear. Also, the software can be used to manage specific building data, becoming a maintenance-managing tool as well. Often, county or city offices are already implementing GIS technology and data can be shared and expanded among these organizations in the district. The opportunity also exists for collaboration with other agencies to share in the cost of initial implementation of GIS systems.



Low, Moderate, and High Projections

This report contains low, moderate, and high ten-year enrollment projections both district-wide and by-school. A range of projections is made available to accommodate the trends in ACPS. The moderate projection is based on the current level of development in ACPS, and therefore is considered the “Most-likely” projection.

Differences in housing development, birth rates, and inflation are factors in determining which projection is most appropriate for a school district. The following table outlines these factors:

Low Projection	Moderate Projection	High Projection
Decline in new housing	Moderate level of new housing, slightly less than current activity	High level of new housing, slightly more than current activity
Decline in live births	Steady number of live births	Increase in live births
Higher inflation/interest rates	Moderate inflation/interest rates	Low inflation/interest rates

Projections were developed by analyzing the following data:

- Live birth data
- Demographic data
- Building permits for single-family units
- Historical enrollment by grade