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ABSTRACT

Intending to provide school administrators with technical information to assist in preparing student enrollment projections and techniques in analyzing projections, this paper explores the state of the art, major factors affecting school populations, and the Cohort Survival Ratio Method. The authors caution that there are no absolutely reliable methods for predicting changes in enrollment, but state that the Cohort Survival Ratio Method is generally accepted as the most understandable and effective tool available. The factors greatly affecting student numbers are identified as births, migration, and holding power (dropout rate). The authors conclude that pupil population projections are essential in planning budgets, programs, and facilities and that educational planners should collect information from private, commercial, and governmental agencies. They further recommend that each administrative unit have a person responsible for making enrollment projections. (Author/WD)

pupil population projections

ESSENTIAL TOOLS FOR EDUCATIONAL PLANNERS

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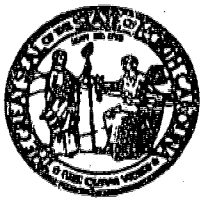

PREFACE

Pupil population projections are important tools for educational planners. In the 1950's and early 1960's, most of the administrative units in [illegible]th Carolin were experiencing considerable growth in student membership. At that time, few administrators suspected that the mid 1960's would bring a leveling off and that most school systems would experience a sharp decline during the 1970's.

Projecting student membership is difficult since there are no certain method for predicting the number of births or the mobility of the population. School administrators should, however, use the best techniques available. Pupil population projections are needed for budget preparation and program planning and are essential in purchasing sites and planning buildings which have a life expectancy of more than fifty years.

This publication was prepared by the Division of School Planning to give school administrators a broad view of the problem, to provide sufficient technical information to prepare population projections, and to assist administrators in analyzing the projections prepared annually by the Division. Since projecting student membership is a unique problem for each administrative unit,

outside help is often needed. Cons[illegible]s from [illegible]vision of School Plannin are available to assist local unit[illegible]nterpre[illegible]he Division's computerize projections, to prepare new proje[illegible]for the [illegible]em, to prepare projections for school attendance areas, or to [illegible]depth analysis of the pupil population and population trends.

This publication was prepar[illegible] by [illegible]rell Spencer, Assistant Director, Division of School Planning. Mis[illegible] Debbi[illegible]assiter, Drafting Technician, provided the art work.

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I

PUPIL POPULATION PROJECTIONS-THE STATE OF THE ART

Man has always felt a need to predict future events or trends. Certain individuals, whom we describe as futurists, make predictions because they are fascinated with the future. Other individuals make predictions or projections because of their concern for planning and their role as decision makers.

School administrators are in a decision-making role. They must prepare budgets, employ personnel, and justify projections of resources and expenditures to the public, county commissioners, and citizen groups. The effect of long-range decisions is never more important than in planning facilities. Facility planning involves a commitment in excess of fifty years. Good decisions on the size and placement of school facilities should be based on the best information which is available.

There are several methods of making projections; however, the straight-line method is most often used in making personal and professional decisions. For example, if the rate of inflation was ten percent last year and twelve percent this year, we assume that it will be fourteen percent next year. If the price of a stock in X company was twenty-five dollars yesterday and

twenty-eight dollars today, the straight-line method of projecting indicates that this stock will sell for approximately thirty-one dollars tomorrow.

There is one example of a straight-line projection which now seems preposterous but may have seemed reasonable at the time. In the 1930's, telephone switchboards were operated manually. At that time, it was projected that by 1980 all employable females in the United States would be required as telephone operators. Obviously, there were factors which were not taken into consideration when the straight-line method was applied to this problem.

In the absence of better planning techniques, school administrators and board members have frequently made straight-line projections of school membership. For example, in 1952, North Carolina had 99,727 children entering the first grade; by 1954, the number of first graders had increased to 123,927. Using a straight-line projection, school administrators would have assumed a very significant increase and consequent need for school facilities. By 1957, however, the number of first graders had declined to 108,508. This increase and decrease in first graders, however, was anticipated by school administrators who were observing the number of live births in their administrative units. The first grade membership generally parallels the number of live births from six years earlier.

There are several sophisticated systems for projecting the number of persons in the school-age population or for projecting school memberships.

Without exception, these instruments depend on historical factors for the projections. These historical factors include rates of in- or out-migration, number of births per one thousand population, number of births per one thousand women of childbearing age, etc. These factors have obviously changed during the last decade and only the futurists would hazard a prediction for the future. Pupil population projections, consequently, are not sure-fire methods but tools for projecting and analyzing the trends that are occurring.

The most recognized method for projecting school membership is the Cohort Survival Ratio Method. Educational planners generally agree that this method is not only understandable to educators and laypeople but probably the most reliable tool for making pupil population projections. This methodology relies heavily on the number of live births; consequently, projections for the first grade cannot be made more than five years in advance. This is obviously a disadvantage in making long-term commitments for school facilities; however, the Cohort Survival Ratio Method is generally more accurate than other methodologies.

The Division of School Planning provides computerized pupil population projections to each administrative unit each year. School administrators should monitor these projections for accuracy and discernible trends.

The Division also monitors the projections for accuracy and trends. For example, the Division reviewed the reliability of the projections made in

1973-74 as compared to the actual memberships in 1978-79. The results were as follows:

RELIABILITY OF 1973-74 PROJECTIONS AFTER FOUR YEARS

ADM	NUMBER OF UNITS	LESS THAN ±3%	±3% to ±5%	±5% to ±10%	MORE THAN ±10%
Over 15,000	13	9 (69%)	4 (31%)	--	--
10,000-15,000	18	8 (44%)	5 (28%)	3 (17%)	2 (11%)
5,000-10,000	49	13 (27%)	9 (18%)	15 (31%)	12 (24%)
2,000-5,000	48	14 (29%)	5 (11%)	16 (33%)	13 (27%)
Under 2,000	16	2 (12%)	2 (12%)	6 (38%)	6 (38%)

An analysis of these data indicates the following:

- For units over 15,000 ADM, the four-year projections fell within ±5%. Sixty-nine percent of the projections fell within ±3%. This method was also very reliable for units between 10,000 and 15,000 students.
- The Cohort Survival Method is less reliable for smaller units. For those with less than 2,000 ADM, only 12% fell within ±3%. Sixty-two percent fell within ±10%.

The system proved to be highly reliable for large units but less reliable for smaller units. Even for the units where the projections proved to be less reliable they were valuable. Consider the following:

- The 1970's was a decade of decline for most units. Generally, the projections correctly warned administrators of whether the membership was increasing or decreasing and the relative severity of the change.

- The projections were updated each year; consequently, observant administrators took note of the changing trends on a year-by-year basis.
- Educators who were knowledgeable regarding the Cohort Survival Ratio Method could anticipate emerging trends.
- Projections for the first year are generally very reliable. Projections tend to compound inaccuracies and are less reliable in successive years.
- The Cohort Survival Ratio Method is a valuable tool for analyzing the factors which produce population changes such as migration, private schools, student failures, dropouts, births, boundary changes, etc.
- Facilities are generally flexible enough to adequately accommodate 10% more or fewer students than the optimum capacity.

In summary, there are no absolutely reliable methods for making pupil population projections. Educators generally agree that the Cohort Survival Ratio Method is understandable and the best tool available. New projections should be prepared each year and educational planners should monitor any changes which are occurring. While this publication is primarily concerned with this method of making projections, planners are urged to consider projections made by chambers of commerce, utility companies, private consulting firms, city and county planners, and other state and federal agencies.

II

MAJOR FACTORS AFFECTING THE SCHOOL POPULATION

The student population of a school system is primarily influenced by the number of births, the amount of net migration, and the holding power of the schools at the secondary level. The number of births is a fairly consistent indicator of future school membership as the first grade membership responds rather faithfully to the number of births six years previously. The charts on the right are for North Carolina births and first graders; the relationship is less predictable for a smaller geographic area such as a county or city administrative unit; however, this information is still useful to the educational planner.

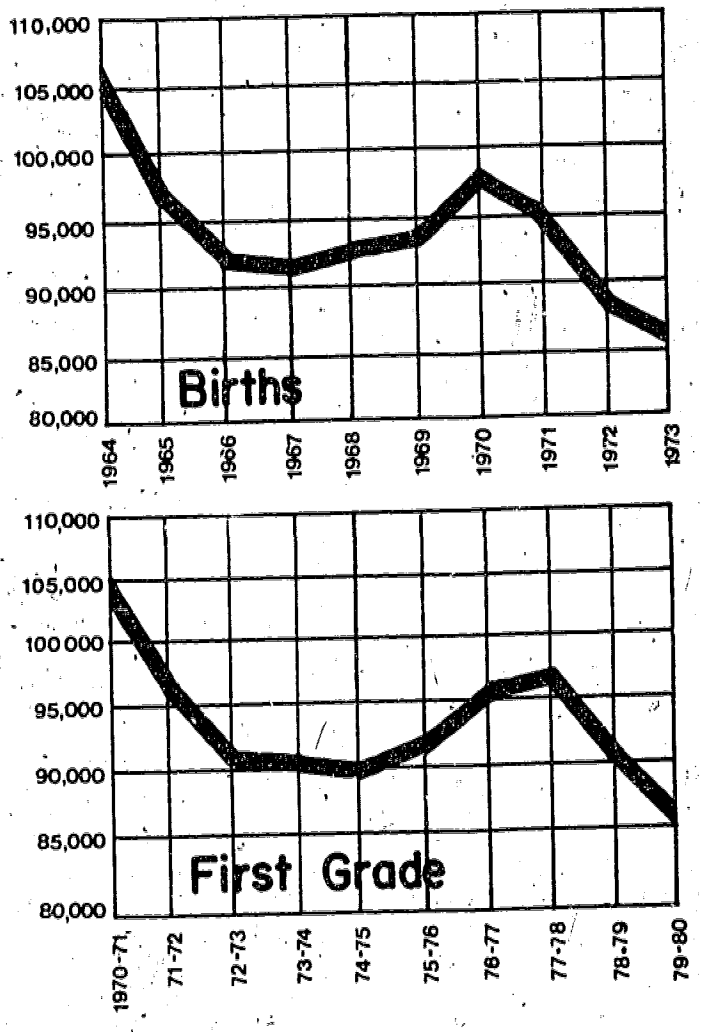


Fig. 1 - North Carolina Births and First Grade Membership

There are three major factors which affect the number of births in a geographic area such as a county or school system:

- The number of women of childbearing age
- Expectations regarding family size
- The ability to influence the number of births through family planning

The present decline in the number of births is unrelated to the number of women of childbearing age. In fact, the number of women in this age group was increasing during the 1970's while the number of births was declining. Expectations regarding family size and family planning are, consequently, the factors which are influencing the number of births.

The following terminology is used in discussing the number of births:

- Number of Births - The number of live births to the residents of a city, county, state, nation, etc. For example, the number of births to residents of North Carolina declined from 115,792 in 1956 to 80,549 in 1977.
- Birth Rate - The number of births per 1,000 total population. The birth rate in North Carolina declined from 25.8 in 1950 to 14.8 in 1978. In 1978, the birth rates in North Carolina ranged from a low of 9.7 in Polk County to a high of 24.3 in Onslow County.
- Children Per Family - The average number of children per family was as high as seven in the 1800's but fell to 1.7 in 1974.

The "birth rate" concept is especially important in understanding populatio trends. For example, a community may be experiencing significant growth but a decline in the number of live births. This pattern can be explained by the birt rate. The following illustrates this point:

> A county had a total population of 200,000 in 1970. Because of considerable industrial, commercial, and institutional growth, the total population had increased to 300,000 by 1978. During this period of time, however, the number of births to residents of the county declined from 4,000 in 1970 to 3,600 in 1978. School administrators and citizens were surprised by the decline in the number of births while the county was experiencing growth. This county was typical of many other counties in North Carolina as the birth rate had declined from 20 births per 1,000 population in 1970 to 12 births per 1,000 population in 1978.

Planners should be aware of but not overly influenced by housing starts, industrial growth, and in-migration of adults. The birth rate and the number of live births should be monitored closely as they are better indicators of school membership trends.

Without migration, the number of births would almost perfectly indicate the number of first grade students, six years later. As a result of migration, however, the first grade membership will generally be more or less than the number of births. For example, a county may have 1,000 live births but only 800 first graders, six years later. Conversely, a county may have 1,500 live births but 1,800 first graders, six years later. Until recent years, North Carolina experienced some out-migration between birth and first grade; in the

late 1970's, this situation reversed, and now North Carolina is experiencing some in-migration between birth and first grade.

Likewise, migration affects the number of students as they move from grade to grade. For example, the third grade may have 300 students this year and the fourth grade may have 325 students next year. Conversely, the third grade could have 300 students this year and the fourth grade may have 275 students next year.

Until the early 1970's, the major metropolitan areas across the nation were continuing to grow and the rural areas were declining. In the mid 1970's, there appeared to be a significant change in this pattern. While many rural areas are continuing to decline, many metropolitan areas are beginning to stabilize or decline also. Growth is continuing, however, in many small and medium-size towns and in the suburbs around large towns.

Mobility is difficult to predict; however, the following conditions may affect the rate of in- or out-migration for a county or community:

- o New industries or a significant expansion of existing industries
- o The closing down or reduction of work force in existing industries
- o New housing projects, urban renewal, slum clearance
- o Changes in the number of utility connections or construction permits

Planners frequently overestimate the impact of new housing and new industry. Industrialists frequently seek areas with high unemployment and a readily available supply of labor. With the exception of top management, the labor force for a new

industry will likely be employed locally and result in little in-migration. An exception would be an industry which employs highly-paid specialists who would not be available in the local work force.

New housing developments may cause a shift in students within a school system but may result in little change in the total number of students. New houses in new subdivisions are visible, but rural, isolated homes which are abandoned go unnoticed.

There is a danger of overbuilding classrooms to accommodate new housing projects. New subdivisions have many young children, but as the community matures there will be fewer elementary children each year. Many school systems use mobile or relocatable units to temporarily accommodate the large number of children from a new subdivision.

This graph illustrates the membership change which occurred in a new elementary school serving a new subdivision in Piedmont North Carolina. The school was constructed in 1963 to serve 400 students; on opening day, the school had 460 students. Additional classrooms were added to accommodate a total of 600 students. In the third year of

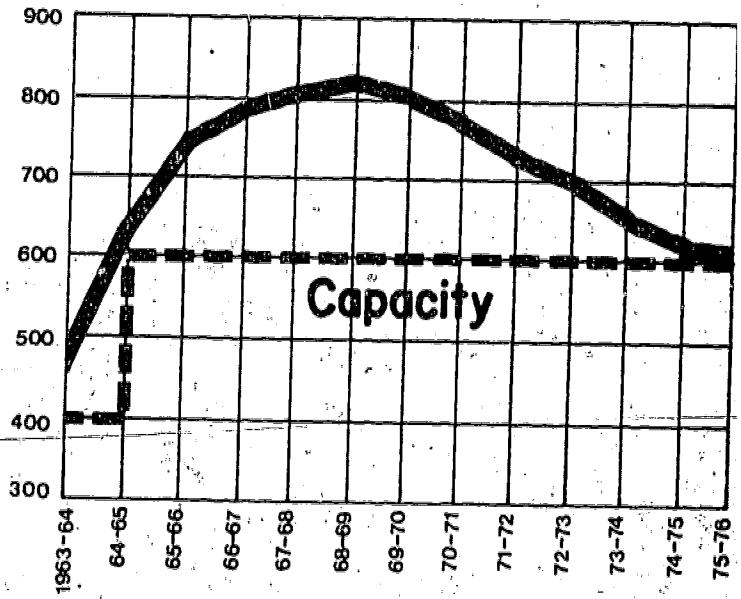


Fig. 2 - New Elementary School-Capacity and Membership

operation, the school opened with 740 students; mobile units were used for the overflow. Six years after the school was constructed, the membership peaked at 825 students but began to decline. By 1975, the school could accommodate the students without the mobile units. Because of cross-town busing, the school is presently well-utilized, but the number of school-age children in the original attendance area continues to decline. Without satellite attendance areas, this school would be considerably under capacity today.

OLDING POWER

Reliable data regarding the holding power of the secondary schools is difficult to obtain. Students who fail to graduate from high school are often counted several times as dropouts. For example, a student may drop out of school for three consecutive years or may enroll at another school and be counted twice as a dropout in one year.

One method of determining the number of dropouts is to compare the number of high school graduates with the eighth graders from four years previously. In North Carolina, this procedure indicates that approximately 68.5 percent of the students graduate. This procedure, however, does not recognize migration as a contributing factor. If there is in-migration, the dropout rate would appear to be lower; if there is out-migration, the dropout rate would appear to be higher.

III

THE COHORT SURVIVAL RATIO METHOD

The Division of School Planning uses the Cohort Survival Ratio Method which is widely accepted as the best means of projecting school membership. This metho accommodates the following factors:

- o Increase or decrease in births
- o Student deaths
- o Net in-migration or out-migration
- o Non-promotions
- o Increase or decrease in the holding power of the secondary schools
- o Increase or decrease in private school membership

The Cohort Survival Method can be used to project the number of elementary students for five years and the number of junior and high school students for ten years. Like many systems for making projections, the process is more reliable short-range than long-range; consequently, the projections should be updated each year.

Like most methods for making projections, the Cohort Survival Method analyzes the past and projects this behavior into the future. The system will project in

reliable manner until there is a significant change in migration patterns, private school membership, or the secondary schools' holding power.

HE SURVIVAL RATIO

There is a relationship between the number of births in a county and the number of first grade students six years later; this relationship is known as the Survival Ratio (SR). For example:

> If your county had 100 births six years earlier and only 75 first graders this year, the SR would be .75.
>
> If your county had 100 births six years earlier but 125 first graders this year, the SR would be 1.25.

SR's can be averaged. For example, .99, 1.063, 1.267, 1.000 and 1.203 would give an Average Survival Ratio (ASR) of 1.105. This figure can be used to project the first grade membership for a six-year period if the number of births is known.

Averaging SR's can be misleading if they are increasing or decreasing significantly. For example, the numerical average for .50, .45, .40, .35 and .30 is .40. This average, however, does not indicate the decreasing trend which has occurred in the past and will likely continue in the future. In this case the ASR could be selected subjectively or a formula could be used which weights the more recent SR's.

The annual birth count is available for counties but is generally not available for administrative units which are not coterminous with the county. This may reduce the reliability of the projections for city administrative units and for county units which serve less than the entire county. The SR in this case indicates the

relationship between the number of births in the county and the number of first graders in the unit for which a projection is being made. For example:

> If the county had 100 births six years previously but has only 40 first graders this year, the SR is .40. The other administrative unit in the county may have 45 first graders and an SR of .45.

THE RETENTION RATIO

There is also a relationship between the number of students in a given grade this year and the number of students in the following grade the next year. This relationship is known as the Retention Ratio (RR). For example:

> If you had 100 students in grade 3 last year and 90 students in grade 4 this year, you would have an RR of .90.
>
> If you had 100 students in grade 5 last year and 105 students in grade 6 this year, you would have an RR of 1.05.

The RR's between grades for several years are generally consistent. For example, the RR's between grade 3 and grade 4 may be .991, 1.031, 1.032 and 1.000; consequently, the RR's can be averaged (1.013) and this Average Retention Ratio (ARR) can be used to project the relationship between grade 3 and grade 4 in the future. Generally, there is no value in weighting RR's as they are fairly consistent.

ROJECTING FOR SCHOOL SYSTEM

Each administrative unit should have a person who can prepare and interpret pupil population projections. Although projections are provided annually by the Division of School Planning, this person may wish to do system-wide projections using additional information or do projections for individual schools or attendance areas.

The following procedures for making unit-wide projections are based on the forms which are available from the Division of School Planning without charge. (A copy of a completed projection is located in the appendix.)

1. Place the final ADM for each of the last five years on the first five lines of the form. The projections, consequently, will indicate the projected final ADM.

2. In column #2, enter the number of births for the county so as to be six years previous to the school year. For example, the births for 1971 should be entered opposite the 1977-78 school year. Births should be entered on the form through the most current year available.

The state publication, North Carolina Vital Statistics, includes the number of births to the residents of each county. This data should not be confused with information frequently available at the county health department regarding the number of births occurring in the county.

The birth data from Vital Statistics can be used to make projections; however, the Department of Human Resources provides the Division with more specific data regarding the number of births to residents of each county between October 16 and the following October 15; this is the birth information found in the Division's computerized projections and would be most reliable for making projections.

3. Calculate the SR's between the number of births and the number of students in grade one. For example, 922 ÷ 845 = 1.091.

BIRTHS			YEAR	Membership in	
YEAR	NUMBER	SR		GRADE K	GRADE 1
1968	845	1.091	1974-75	639	922

4. Average the five SR's to obtain an Average Survival Ratio (ASR). If the SR's are significantly increasing or decreasing, use a weighted formula or choose an ASR which appears to be more representative of the trend which is occurring. (A suggested formula for weighting SR's will be discussed later.) Enter the ASR in the five years of the projection.

SR
1.091
1.051
1.063
1.043
1.111
1.074
1.074
1.074
1.074
1.074

5. Use the ASR and the number of births to project the number of students in grade one for the first five years of the projection.

6. Calculate the RR's between grades. For example, 868 ÷ 922 = .941.

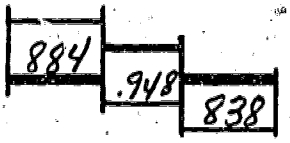
ship in each

GRADE 1	RR
922	.941
868	

7. Average the four RR's for each year. Enter the ARR in the ten years of the projection.

RR
1.017
1.002
1.006
1.015
1.010
1.010
1.010
1.010
1.010
1.010
1.010
1.010
1.010

8. Use the ARR to compute the number of students in the following grade for the subsequent year. For example, if you have 884 students in grade one for 1978-79 and an ARR of .948, you would project 838 students in grade two for the 1979-80 year. Using this procedure, compute the number of students in grades 2-12 of the first year of the projection. Continue this procedure for the remaining years of the projection.



9. The projected kindergarten membership is obtained by "backing up" the first grade from the next year. The percentage you "back up" should be based on experience also. In the example, 97.8 percent of the first graders were "backed up."

1979-80	811	812
1980-81	813	828
1981-82	738	830
1982-83	821	754
1983-84	747	839
1984-85		762

10. Total the number of students according to your grade organization. For example, K-5, 6-8, 9-12 or K-6, 7-9, 10-12. Remember -- if the historical membership data was final ADM, the projections will be final ADM. Because of dropouts, you will have approximately three percent more 9-12 students in the first month than the final ADM figure indicates. This must be considered in planning buildings. Local administrative units can use other historical data such as first month ADM or third month ADM.

COMPUTERIZED PROJECTIONS

The Division of School Planning annually prepares pupil population projections for each school system in North Carolina. The Cohort Survival Method is used; however, the format is modified for the computer. For example, the Retention Ratios are grouped together and the totals for various grade organizations are grouped together.

The computer is programmed to weight the ASR in favor of the more recent SR's:

$$\frac{\text{SR \#1} + (2)\ \text{SR \#2} + (3)\ \text{SR \#3} + (4)\ \text{SR \#4} + (5)\ \text{SR \#5}}{15} = \text{ASR}$$

The following situation illustrates the advantage of the weighted formula rather than a numerical average:

The SR's in a city administrative unit are decreasing each year as follows: .65, .60, .55, .50 and .45. The numerical average would be .55. The weighted formula would skew the ASR toward the most recent SR as follows:

$$\frac{.65 + (2)\ .60 + (3)\ .55 + (4)\ .50 + (5)\ .45}{15} = .516$$

Perhaps an ASR which is subjectively selected would be more defensible than .516; however, the weighted ASR seems to be more defensible than a numerical average.

OJECTING FOR ENDANCE AREAS

The Cohort Survival Method can be used for individual schools; however, the reliability of the projection, particularly at the elementary level, diminishes considerably for smaller geographic areas for two reasons. First, the membership of a small geographic area can be influenced significantly by a new housing development, a new highway, a new industry, etc. Second, a small SR such as .20 is less reliable than a larger SR such as .90. The poorer reliability of projecting for individual schools should not discourage the planner if the limitations of the projection are acknowledged and accepted.

NALYZING THE ROJECTIONS

The Cohort Survival Method, like most tools for projecting, is based on the assumption that historical trends will continue. This system for projecting student populations is not 100 percent reliable; however, this is the most reliable system available. Population projections can be used effectively when the limitations are accepted and acknowledged. For example, the projections are highly reliable for grades 2-12 for the first year of the projection but decrease in reliability each succeeding year. The first grade projections are

less reliable since six years have passed between the time of birth and entering grade one. The following are generally more reliable as they are not affected by the ASR:

- Grades 2-12 of the first year
- Grades 3-12 of the second year
- Grades 4-12 of the third year
- Grades 5-12 of the fourth year
- Grades 6-12 of the fifth year, etc.

In addition to the actual projections, the Cohort Survival Method provides a tool for examining the following:

- Are the SR's increasing or decreasing?
- Are the RR's for each grade increasing or decreasing?
- Are there sudden changes in the SR's or RR's? If so, how can the change be explained?
- Do policies regarding promotion or retention affect the RR's?
- What are the RR's at the high school level? Do they indicate that the holding power of the secondary schools is increasing or decreasing?
- Do the SR's and RR's indicate net in- or out-migration? (Where there is more than one unit in a county, add the SR's to determine the total county's migration pattern.)
- Is the ASR which was used defensible? If not, what ASR would you have used?
- Is there information available which indicates that the projections are inaccurate?

IV

OTHER USEFUL DATA

The North Carolina Department of Administration, Division of Budget and Management, makes ten-year county projections by age groups. There should be a positive relationship between the projected number of persons in a county who are from five to nineteen years of age and the projected number of students.

Chambers of commerce, banks, utility companies, advertising agencies, and industry-seeking groups do population projections. While these projections should be studied, the planner should consider the possibility that they may be optimistic in terms of growth.

V

SUMMARY

Pupil population projections are essential in planning educational budgets, programs, and especially facilities. Educational planners should collect information which will be beneficial in making projections from private, commercial, and governmental agencies.

The Cohort Survival Method is widely accepted as the best available means for projecting pupil membership. This system is most often used to project unit-wide membership. Projecting the membership for individual schools or attendance areas is useful, but less reliable.

Each administrative unit should have a person who is responsible for making pupil population projections. In a small unit the superintendent or supervisor may be responsible; in a large unit the Director of Pupil Personnel Services, the Director of Planning, or the Director of Research and Development may be responsible.

Local administrators are urged to contact the Division of School Planning for assistance in interpreting the Division's computerized projections or in making new or different projections for the school system or attendance areas.

Appendix

PUPIL POPULATION CHART

Sources of Data:

Computed by:

BIRTHS			YEAR	Membership in each grade and retention ratios (RR) between grades															
YEAR	NUMBER	SR		GRADE K	GRADE 1	RR	GRADE 2	RR	GRADE 3	RR	GRADE 4	RR	GRADE 5	RR	GRADE 6	RR	GRADE 7	RR
1968	845	1.091	1974-75	639	922		885		848		936		952		954		930	
1969	859	1.051	1975-76	702	903	.941	868	1.014	897	.996	845	1.017	952	.995	947	1.007	961	.974
1970	835	1.063	1976-77	834	888	.955	862	.991	860	1.003	900	1.002	847	1.007	959	1.022	968	1.010
1971	889	1.043	1977-78	817	927	.961	853	.976	841	1.024	881	1.006	905	1.000	847	1.014	972	1.009
1972	796	1.111	1978-79	795	884	.936	868	.988	843	1.012	851	1.015	894	.992	898	1.019	863	1.005
1973	756	1.074	1979-80	811	812	.948	838	.992	861	1.009	851	1.010	859	.999	893	1.015	912	1.000
1974	771	1.074	1980-81	813	828	.948	770	.992	831	1.009	869	1.010	859	.999	858	1.015	907	1.000
1975	773	1.074	1981-82	738	830	.948	785	.992	764	1.009	839	1.010	878	.999	858	1.015	871	1.000
1976	702	1.074	1982-83	821	754	.948	787	.992	779	1.009	771	1.010	847	.999	877	1.015	871	1.000
1977	781	1.074	1983-84	747	839	.948	715	.992	781	1.009	786	1.010	779	.999	846	1.015	891	1.000
1978	710		1984-85		762	.948	796	.992	709	1.009	788	1.010	794	.999	778	1.015	859	1.000
			1985-86				723	.992	790	1.009	715	1.010	796	.999	793	1.015	790	1.000
			1986-87						717	1.009	797	1.010	722	.999	795	1.015	805	1.000
			1987-88								723	1.010	805	.999	721	1.015	807	1.000
			1988-89										730		804		732	

Date:	School(s):	Administrative Unit
		Rutherford County Schools

GRADE 8	RR	GRADE 9	RR	GRADE 10	RR	GRADE 11	RR	GRADE 12	SPECIAL EDUCATION 1–8	SPECIAL EDUCATION 9–12		TOTALS K-5	6-8	9-12	K-12	1-12		
891		944		807		607		581				5182	2775	2939	10896	10257		
	1.037		.851		.879		.867											
906		924		802		709		526				5167	2814	2961	10942	10240		
	1.041		.878		.825		.855											
971		943		811		662		606				5191	2898	3022	11111	10277		
	1.007		.873		.862		.899											
977		978		823		699		595				5224	2796	3095	11115	10298		
	1.016		.840		.830		.867											
977		993		822		683		606	10			5135	2738	3104	10987	10192		
	1.025		.860		.849		.872											
863		1002		854		698		595	10			5032	2668	3149	10859	10048		
	1.025		.860		.849		.872											
912		885		862		725		608	10			4970	2677	3080	10737	9924		
	1.025		.860		.849		.872											
907		935		761		732		632	10			4834	2636	3060	10540	9802		
	1.025		.860		.849		.872											
871		930		804		646		638	10			4759	2619	3018	10406	9585		
	1.025		.860		.849		.872											
871		893		800		683		563	10			4647	2608	2939	10204	9457		
	1.025		.860		.849		.872											
891		893		768		679		595					2528	2935		8550		
	1.025		.860		.849		.872											
859		914		768		652		592					2442	2926				
	1.025		.860		.849		.872											
790		881		786		652		568					2390	2887				
	1.025		.860		.849		.872											
805		810		758		667		568					2333	2803				
	1.025		.860		.849		.872											
807		825		697		644		581					2343	2747				

ADMINISTRATIVE UNIT NAME = RUTHERFORD

RETENTION RATIOS

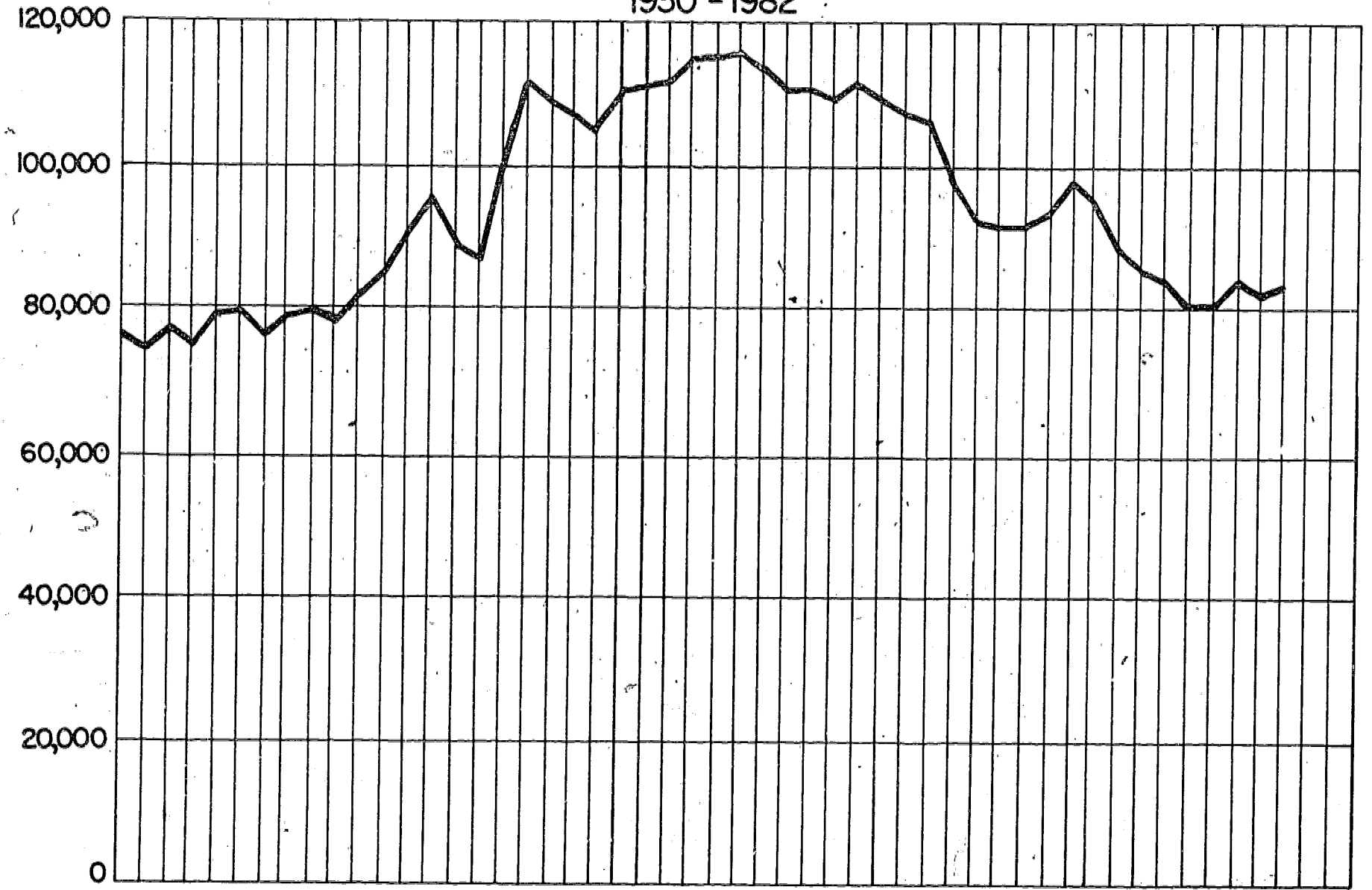
SCHOOL YEAR	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12
1974-75	0.941	1.014	0.996	1.017	0.995	1.007	0.974	1.037	0.850	0.879	0.867
1975-76	0.955	0.991	1.003	1.002	1.007	1.022	1.010	1.041	0.878	0.825	0.855
1976-77	0.961	0.976	1.024	1.006	1.000	1.014	1.009	1.007	0.873	0.862	0.899
1977-78	0.936	0.988	1.012	1.015	0.992	1.019	1.005	1.016	0.840	0.830	0.867
AVERAGE	0.948	0.992	1.009	1.010	0.999	1.015	1.000	1.025	0.860	0.849	0.872

BIRTH YEAR	BIRTHS	SP	SCHOOL YEAR	K	1	2	3	4	5	6	7	8	EXC*	9	10	11	12	EXC*	TOTAL
AVERAGE DAILY MEMBERSHIP																			
1968	845	1.091	1974-75	639	922	885	848	936	952	954	930	891	0	944	807	607	581	0	10896
1969	859	1.051	1975-76	702	903	868	897	845	952	947	961	906	0	924	802	709	526	0	10942
1970	835	1.063	1976-77	834	888	862	860	900	847	959	968	971	0	943	811	662	606	0	11111
1971	889	1.043	1977-78	817	927	853	841	881	905	847	972	977	0	978	823	699	595	0	11115
1972	796	1.111	1978-79	795	884	868	843	851	894	898	863	977	10	993	822	683	606	0	10987
AVERAGE DAILY MEMBERSHIP PROJECTION																			
1973	756	1.074	1979-80	811	812	838	861	851	859	893	912	863	10	1002	854	698	595	0	10859
1974	771	1.074	1980-81	813	828	770	831	869	859	858	907	912	10	885	862	725	608	0	10737
1975	773	1.074	1981-82	738	830	785	764	839	878	858	871	907	10	935	761	732	632	0	10540
1976	802	1.074	1982-83	821	754	787	779	771	847	877	871	871	10	930	804	646	638	0	10406
1977	781	1.074	1983-84	747	839	715	781	786	779	846	891	871	10	893	800	683	563	0	10204
1978	710		1984-85		762	796	709	788	794	778	859	891		893	768	679	595		
			1985-86			723	790	715	796	793	790	859		914	768	652	592		
			1986-87				717	797	722	795	805	790		881	786	652	568		
			1987-88					723	805	721	807	805		810	758	667	568		
			1988-89						730	804	732	807		825	697	644	581		

SCHOOL YEAR	GR. K-3	GR. K-5	GR. K-6	GR.K-12	GR. 1-5	GR. 1-6	GR.1-12	GR. 4-6	GR. 5-8	GR. 6-8	GR. 7-9	GR.9-12	GR.10-12
AVERAGE DAILY MEMBERSHIP TOTALS**													
1974-75	3294	5182	6136	10896	4543	5497	10257	2842	3727	2775	2765	2939	1995
1975-76	3370	5167	6114	10942	4465	5412	10240	2744	3766	2814	2791	2961	2037
1976-77	3444	5191	6150	11111	4357	5316	10277	2706	3745	2898	2882	3022	2079
1977-78	3438	5224	6071	11115	4407	5254	10298	2633	3701	2796	2927	3095	2117
1978-79	3390	5135	6033	10987	4340	5238	10192	2643	3632	2738	2833	3104	2111
AVERAGE DAILY MEMBERSHIP TOTALS PROJECTION**													
1979-80	3322	5032	5925	10859	4221	5114	10048	2603	3527	2668	2777	3149	2147
1980-81	3242	4970	5828	10737	4157	5015	9924	2586	3536	2677	2704	3080	2195
1981-82	3117	4834	5692	10540	4096	4954	9802	2575	3514	2636	2713	3060	2125
1982-83	3141	4759	5636	10406	3938	4815	9585	2495	3466	2619	2672	3018	2088
1983-84	3082	4647	5493	10204	3900	4746	9457	2411	3387	2608	2655	2939	2046
1984-85										2528	2643	2935	2042
1985-86										2442	2563	2926	2012
1986-87										2390	2476	2887	2006
1987-88										2333	2422	2803	1993
1988-89										2343	2364	2747	1922

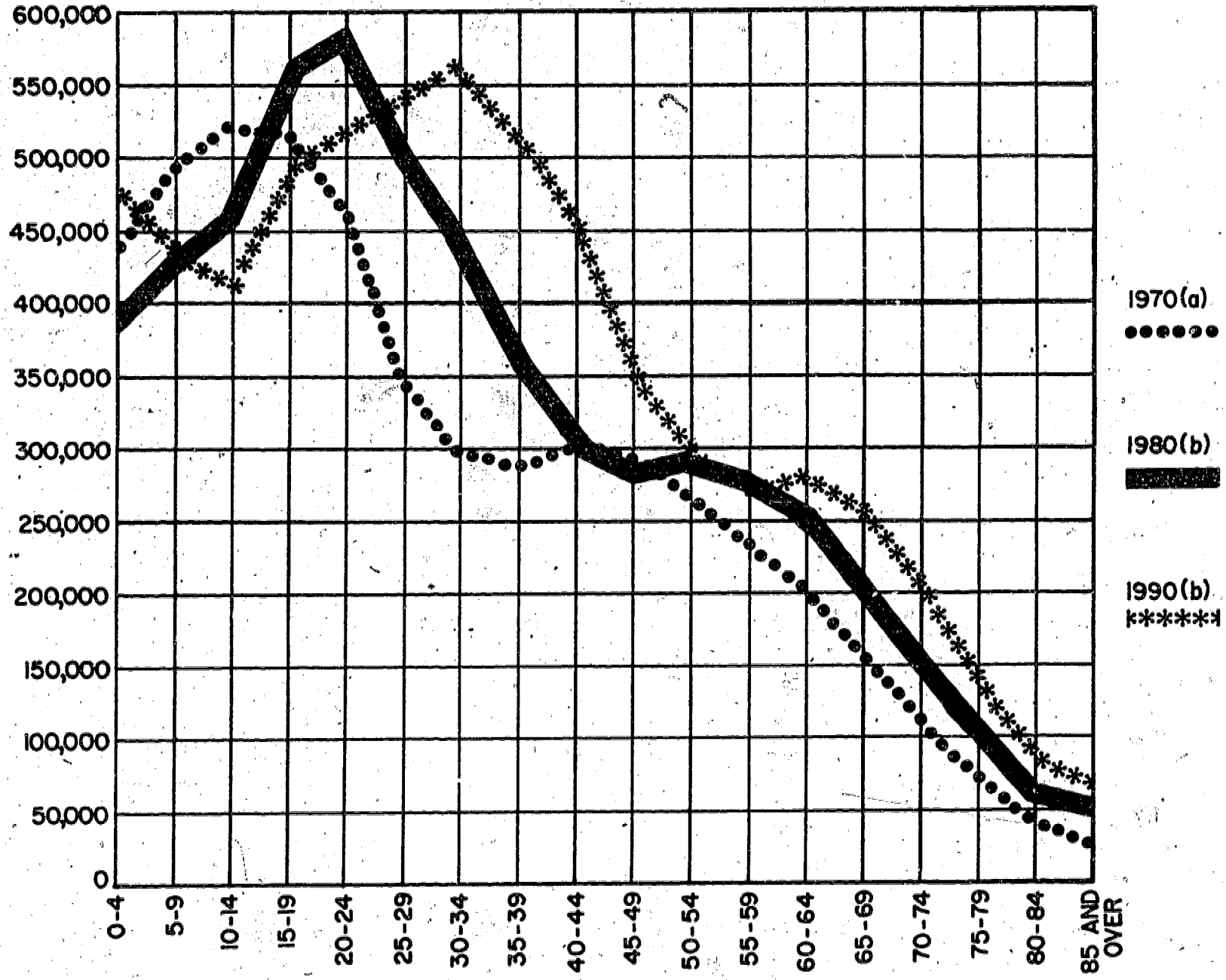
*EXCEPTIONAL STUDENTS IN SELF-CONTAINED CLASSES (TMR STUDENTS ARE NOT INCLUDED)
**EXCEPTIONAL STUDENTS IN SELF-CONTAINED CLASSES (NOT INCLUDING TMR STUDENTS) ARE INCLUDED IN ONLY COLUMNS 1-12 AND K-12

NORTH CAROLINA BIRTHS
1930 - 1982



NOTE: The births indicated above are for calendar years. Since 1979, population projections are based on an October 16 - October 15 year.

NORTH CAROLINA AGE DISTRIBUTION



(a) U.S. CENSUS

(b) PROJECTED—N.C. DEPARTMENT OF ADMINISTRATION

RESOURCES

U. S. DEPARTMENT OF COMMERCE
BUREAU OF CENSUS
WASHINGTON, D. C.

The Census publications include population data for counties and certain cities and towns. These publications may be ordered from the Bureau of Census but are also available at the university libraries and some local libraries. Pertinent census data is also included in surveys by the Division of School Planning.

N. C. DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
ADMINISTRATIVE SERVICES SECTION
PUBLIC HEALTH STATISTICS BRANCH

The publication North Carolina Vital Statistics gives the number of live births to the residents of each county. This publication can also be found in county health departments. County information regarding the number of live births occurring in the county will not be valid for making projections.

DEMOGRAPHIC RESEARCH AND SERVICES UNIT
CAROLINA POPULATION CENTER
UNIVERSITY OF NORTH CAROLINA
AT CHAPEL HILL
CHAPEL HILL, NORTH CAROLINA

The Carolina Population Center can provide consultive services for local administrative units regarding population projections and trends.

DIVISION OF SCHOOL PLANNING
N. C. DEPARTMENT OF PUBLIC INSTRUCTION
RALEIGH, NORTH CAROLINA

The Division of School Planning can provide assistance in interpreting the Division's annual projections, in doing additional unit-wide projections, or in doing projections for attendance areas.

DIVISION OF BUDGET AND MANAGEMENT
N. C. DEPARTMENT OF ADMINISTRATION
RALEIGH, NORTH CAROLINA

This state agency has population projections by age groups for ten years. Pertinent data from this source is also included in surveys by the Division of School Planning.

CITY AND COUNTY PLANNING OFFICES

Many cities and counties have planning offices which can provide assistance with population projections. The planning offices also have information regarding industrial development, housing starts, and utility extensions and connections.

AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS
1801 NORTH MOORE STREET
ARLINGTON, VIRGINIA 22209

A Profound Transformation* (1977) is a slide/tape presentation designed to assist in developing awareness and understanding of the demographic trends affecting society in general and school enrollments and curriculum in particular. The Cost of Decline* (1979) is a slide/tape presentation designed to assist in developing understanding of the causes of public school operating cost increases during periods of enrollment decline.

COUNCIL OF EDUCATIONAL FACILITY PLANNERS, INTERNATIONAL
OHIO STATE UNIVERSITY
COLUMBUS, OHIO 43210

Educational Facilities Digest, "Enrollment Forecasting" (EA 006 860). This publication lists several additional resources regarding pupil population projections.

BANKS, UTILITY COMPANIES, ADVERTISING AGENCIES, CHAMBERS OF COMMERCE, AND INDUSTRY-SEEKING GROUPS

These public and private agencies frequently have planning offices which do population projections and study demographic trends.

* Available through the N. C. Department of Public Instruction, Division of Educational Media.