

APPENDIX A

DEMOGRAPHICS INVENTORY

INTRODUCTION

Population analyses and projections are important elements of any comprehensive plan. Knowing who lives in the City of Bath and for whom we are planning is essential. An understanding of the possible future population size and characteristics is critical in predicting the need for and impact on such areas as public facilities and services, housing, transportation facilities, and the transportation network. Knowing the size, location, and future trends of the City's population will also provide an understanding of its impact on natural resources, open space, important wildlife habitats, views, and water resources.

This appendix explains what has happened to Bath's population in the past and will try to predict what might happen in the future. Readers of this Comprehensive Plan must be cautioned, however, about the difficulty of projecting and forecasting population with any degree of accuracy many years into the future. The Bath Comprehensive Plan written in 1959 forecast that Bath's population in 2000 would be between 13,997 (the low projection) and 16,377 (the high projection). The 1997 Comprehensive Plan also anticipated that Bath's population would increase in the future. The 1997 Plan estimated that there were more than 11,000 people in Bath as of 1990, and it predicted that the 2000 population would be even higher. However, the U.S. Census in 1990 and again in 2000 showed that Bath's population was not growing as previously forecast but, in fact, was decreasing—to 9,799 in 1990 and to 9,266 in 2000. The Maine State Planning Office (SPO) predicted that this population decline will continue. In 2001, SPO projected Bath's 2010 population would decrease to 9,064. In 2003, it projected a bigger decline for Bath's population—8,359 in 2010—and down again to less than 7,000 in 2020. Yet, increases in gasoline prices may bring people back into the City. It is difficult to forecast the future population with certainty.

That said, we must do the best job we can to determine what Bath's population size and characteristics are likely to be in the future.

Before we start the discussion of Bath's population, it is important to know what is meant by certain population terms. In *decennial years* (e.g., 1970, 1980, 1990, and 2000), the U.S. Census Bureau counts the number of people living in the United States by municipality and by other Census-designated areas. The U.S. Census Bureau also statistically determines certain characteristics of that population. These data are referred to as *census counts*. A *population estimate* refers to the population for a current or past year between actual decennial census counts.

A *population projection* is an attempt to determine what the population will be at some time in the future. There are two common types of techniques used to project a future population. One type is referred to as an *extrapolation technique*. This technique uses the population change from the past and trends, or projects, it into the future—the assumption being that what has happened in the past will continue to happen in the future. The other technique is referred to as a *cohort-component* or a *cohort-survival* technique. This is a data-intensive technique that disaggregates total population into age and gender groups (i.e., cohorts) and—making certain assumptions about fertility, mortality, and migration—projects the size of these cohorts in the future.

Although the second technique produces reams of computer-generated reports, some experts claim that it does not produce a projection any more accurate than a simpler technique. Planning texts also point out that there are certain factors about the population that often determine how accurate any projection method might be: accuracy increases with total population size (i.e., a projection for a large population is likely to be more accurate than a projection for a small population); accuracy increases for areas with slow but positive growth rates and decreases for areas with rapid increases; accuracy decreases for areas with population declines; and accuracy decreases more the farther into the future the projection is made.

A *population forecast* is a judgment call, a "best guess," as to which of the various (i.e., low, medium, or high) projections is most likely to occur.

This appendix reviews the changes that have occurred in Bath's population in the past. It also reviews certain components of Bath's population: births,

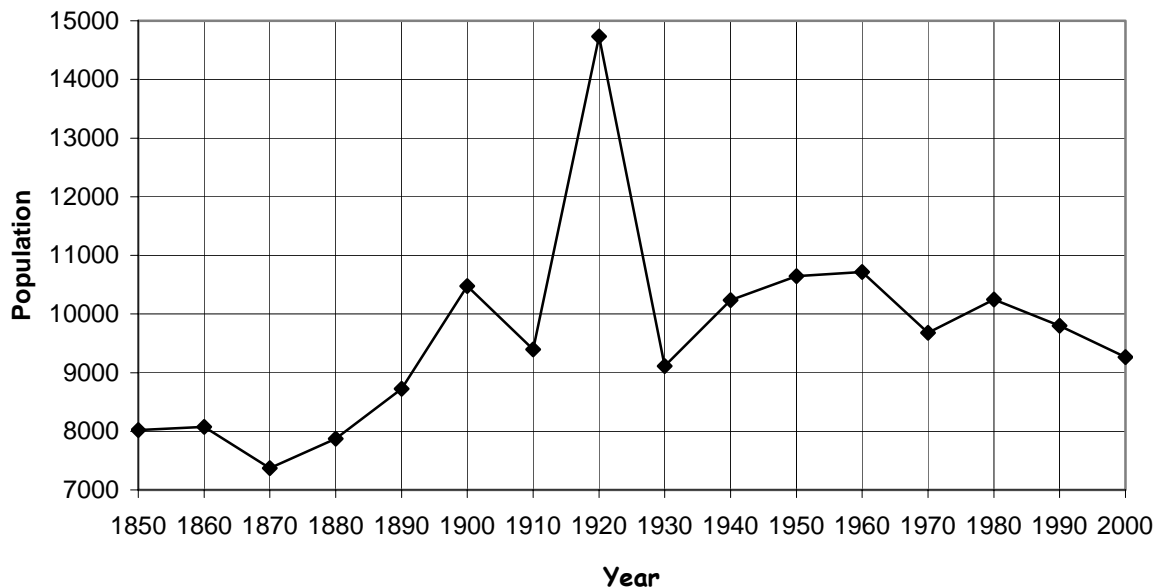
deaths, age groups, household size, age, density, and income and poverty. This appendix also forecasts what the population is likely to be in the future.

It is important to review the population size and some of its characteristics of the towns in the Bath Region (i.e., Bath and the five small surrounding towns—Woolwich, Arrowsic, Georgetown, West Bath, and Phippsburg—plus Brunswick and Topsham). Knowing whether the region's population is growing or declining, aging or getting younger, and other characteristics of the population will help us better plan for Bath's future.

BATH POPULATION CHANGE

With the exception of a big spike in 1920, Bath's population has hovered around 9,000 to 10,000 since 1900 (see the following graph). In 1920, the City was still bursting at the seams with shipyard workers and their families here for shipbuilding jobs during World War I. However, after the number of shipyard jobs declined, so did the population. Between 1920 and 1930, the population declined by about 38 percent; in 1930, there were fewer people in Bath than twenty years earlier. The population increased again in 1940 and continued to increase until after 1950. Since the 1980 U.S. Census, Bath has seen a steady decline in population.

**CITY OF BATH POPULATION
1850-2000**



Source: 2000 U.S. Census

As discussed previously, a 2003 SPO projection predicts that Bath's population will be smaller in 2010 and smaller still in 2020. These projections were using the cohort-component technique. The difficulty with relying on this projection is that if it is run far enough into the future, this method would have Bath's population (as well as that of many other urban Service Center communities) down to zero—and that certainly is not likely to happen.

BATH'S POPULATION AND PERCENTAGE CHANGE 1850-2000

Year	Population	% Change	Year	Population	% Change
1850	8,020		1930	9,110	-38.16%
1860	8,076	0.69%	1940	10,235	12.35%
1870	7,371	-8.73%	1950	10,644	4.00%
1880	7,874	6.82%	1960	10,717	0.69%
1890	8,723	10.78%	1970	9,679	-9.69%
1900	10,477	20.10%	1980	10,246	5.86%
1910	9,396	-10.32%	1990	9,799	-4.36%
1920	14,731	56.78%	2000	9,266	-5.44%

Source: 2000 U.S. Census

COMPONENTS OF POPULATION CHANGE

The variables associated with population change are the number of births to Bath residents, the number of deaths of Bath residents, the amount of in-migration, and the amount of out-migration. Births and deaths are recorded each year by municipal clerks, and trends can be projected to give a fairly accurate picture of future natural increase (i.e., the number of births minus deaths; see the following table).

Migration is a difficult trend to project. Certain assumptions need to be made and questions answered in order to make predictions about migration: Will certain economic conditions (e.g., price and availability of gasoline) change patterns of development? Will job availability change? Will families moving to the Bath Region want to live in rural areas or urban areas? Will urban neighborhoods decline in attractiveness, pushing families to the less urban neighboring towns? Will various state policies that now subsidize rural communities at the expense of Service Center communities change?

Wars have had a tremendous influence on the population of municipalities. The Civil War changed many Maine town and city populations. As discussed previously, Bath's population soared during World War I and increased again during and for fifteen years after World War II as people came here for thousands of new shipbuilding jobs. (Also, during the two World Wars, government-financed housing developments were constructed in Bath, which have had a lasting effect on the City. This is discussed further herein and in Appendix D, the Housing Inventory.) Factors such as these must be considered when making population projections.

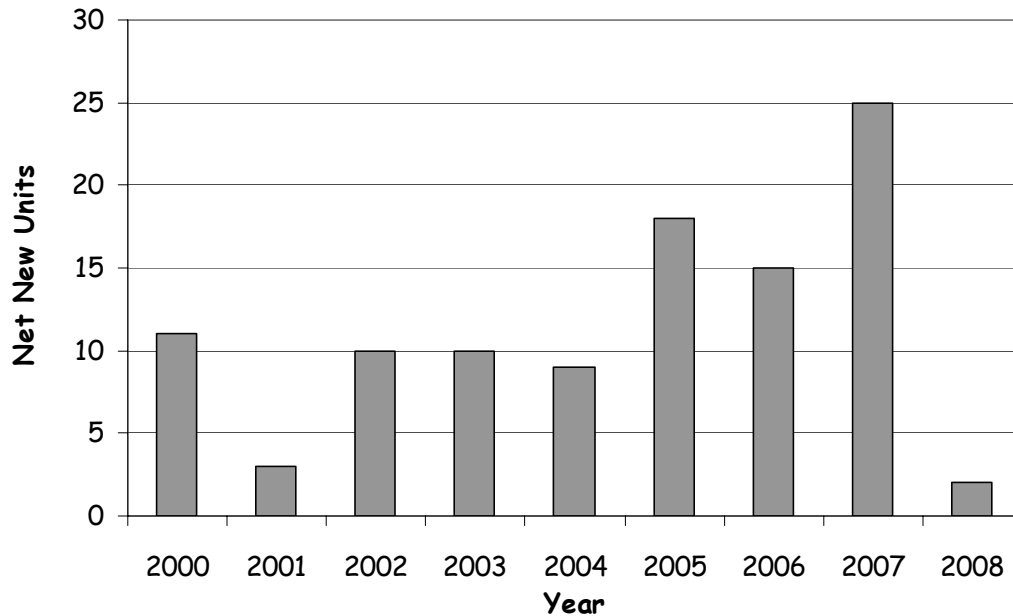
BATH'S NATURAL INCREASE 2000-2007

Year	Births	Deaths	Increase
2000	133	95	38
2001	107	95	12
2002	140	105	35
2003	111	96	15
2004	125	122	3
2005	129	130	-1
2006	136	146	-10
2007	126	122	4
2008	99	89	10

Source: City of Bath Clerk's Office 2009

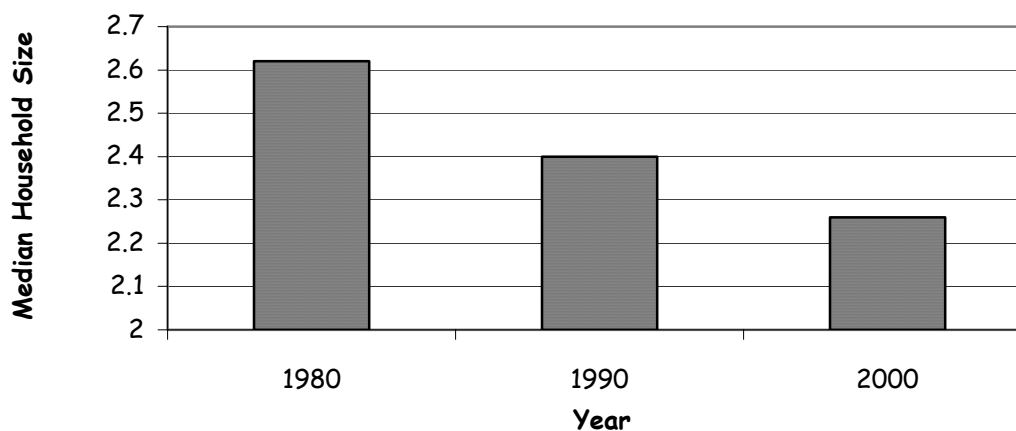
Another factor of population growth or decline is a change in household size. The following graphs show that whereas the number of new housing units has increased (although not as rapidly as in many of the surrounding towns), the number of people living in each unit is decreasing. The average (i.e., mean) number of new homes built annually from 2000 through 2007 is twelve. (In 2007, twenty-five new dwelling units were permitted; however, as of October 2008 only five had been constructed.) This means that even if there is a natural increase (i.e., more births than deaths) and new housing units are built, there may still be a population decline because there are likely to be fewer people living in each housing unit. The mean household size decreased from 2.62 in 1980 to 2.40 in 1990 and then to 2.26 in 2000.

BATH'S NEW DWELLING UNITS 2000-2008



Source: City of Bath Codes Enforcement Department, 2009.

BATH'S MEAN HOUSEHOLD SIZE 1980-2000

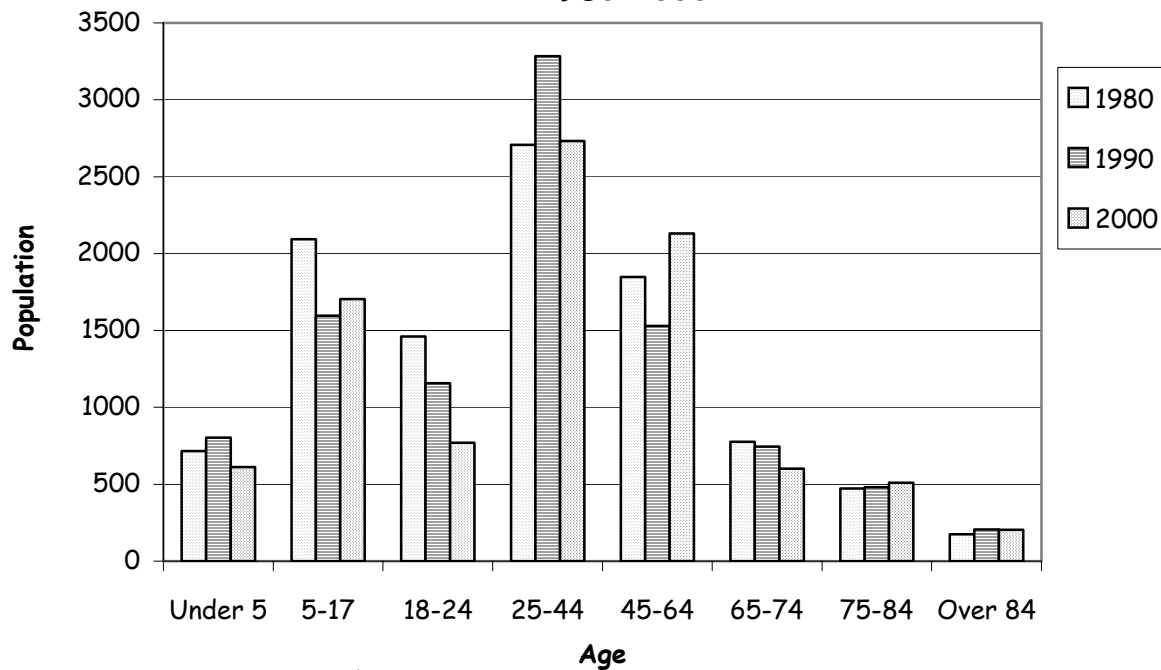


Source: 2000 U.S. Census

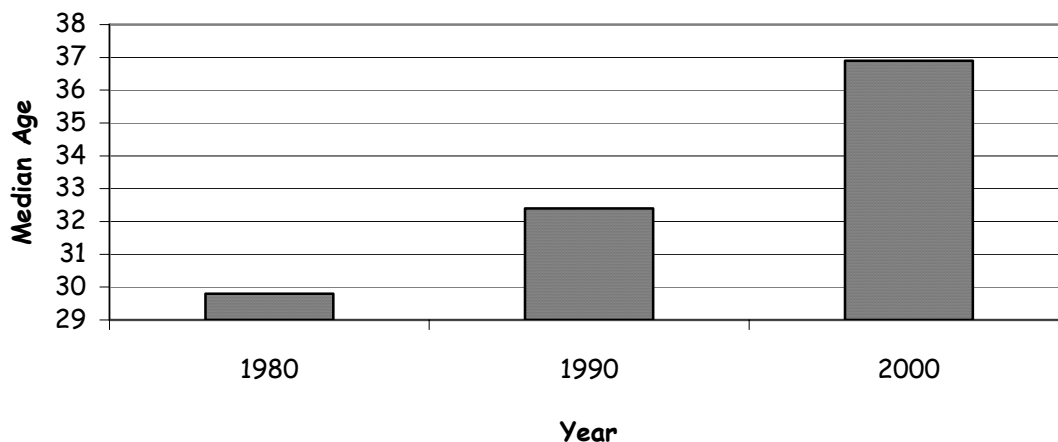
There is another factor in this change in population. The following graphs show that the median age of Bath's population is increasing and that the middle-age population group (i.e., 45- to 64-year-old group) is growing rapidly.

What does this reveal? There is (or, at least, there was from 1980 to 2000) an aging of the Bath population, a decrease in the average household size, and a large increase in the middle-aged group. This means that there were families moving to Bath but they were smaller and in the early-retirement and retirement age groups. This may also be evidence that the young childbearing-age group (i.e., 18- to 24-year-olds) is leaving Bath.

**BATH'S POPULATION BY AGE GROUP
1980-2000**



**BATH'S MEDIAN AGE
1980-2000**



Anecdotally, there is evidence of both of these factors. We are aware of homes in Bath that were occupied by younger families of four to five people in 1980 and/or 1990 and then by 2000 were occupied by older, two-person families. The fact that Bath schools are losing Bath-resident students (discussed in more detail in Appendix I, the Education Inventory) also confirms this population shift.

Demographics experts expect this trend to continue in the future. However, there may be some evidence (again, anecdotal) that families with young children have been moving into Bath in the last three to five years, replacing some of the older, two-person families. In fact, results of a survey (by the City of Bath Assessor's Office) of people who have recently purchased homes in Bath apparently confirm this finding. With an approximate 15 percent response rate, results indicate that 50 percent of the families in the recently purchased homes have children seventeen years old or younger; 29 percent of the population represented by the survey responses were in the infant to seventeen-year-old age bracket. Although this is not a scientific survey and the 15 percent response rate is low, it is interesting data. It also shows that it is difficult to accurately determine population characteristics between U.S. Census counts.

The aging of the Bath population has many impacts on the City; for example, the needs and demands on public facilities and services (e.g., schools, recreation, and emergency medical services), health care, housing, and retail services.

INCOME AND POVERTY

Other characteristics of the population that are important from a city-planning point of view are income and poverty. The first of the two following tables shows the median family income of Bath and the Bath Region towns according to the 1990 and 2000 censuses and the percentages of families living below the poverty level.

Another measure of potential poverty in a town or city is the percentage of households headed by a female, with no husband present, and with children under eighteen years of age. Bath has a high percentage and, in fact, it is

higher than other urban Service Centers in Maine, which is shown in the second table.

Several factors may be involved, including a large number of multifamily (i.e., apartment) dwellings and many of them being rent-subsidized. These factors are discussed in Appendix D, the Housing Inventory.

**MEDIAN FAMILY INCOME AND PERCENTAGE OF FAMILIES
LIVING BELOW THE POVERTY LEVEL
BATH REGION 1990-2000**

Town/City	1990		2000	
	Median Family Income	% of Families Living Below Poverty Level	Median Family Income	% of Families Living Below Poverty Level
Bath	34,126	9.1	45,830	9.3
Brunswick	36,577	5.3	49,088	5.0
Topsham	37,464	4.4	52,134	3.0
Woolwich	36,952	3.8	47,984	5.6
Arrowsic	35,851	6.0	61,875	0
Georgetown	36,477	2.6	58,438	3.9
Phippsburg	33,819	5.7	53,631	5.8
West Bath	40,994	3.4	52,986	4.0

Source: 2000 U.S. Census

**PERCENTAGE OF FAMILY HOUSEHOLDS,
FEMALE HOUSEHOLDERS, NO HUSBAND PRESENT,
WITH CHILDREN UNDER 18 YEARS
2000**

Bath	9.8
Auburn	8.1
Augusta	7.5
Bangor	8.7
Biddeford	8.3
Lewiston	8.4
Portland	6.6
Waterville	8.9

Source: 2000 U.S. Census

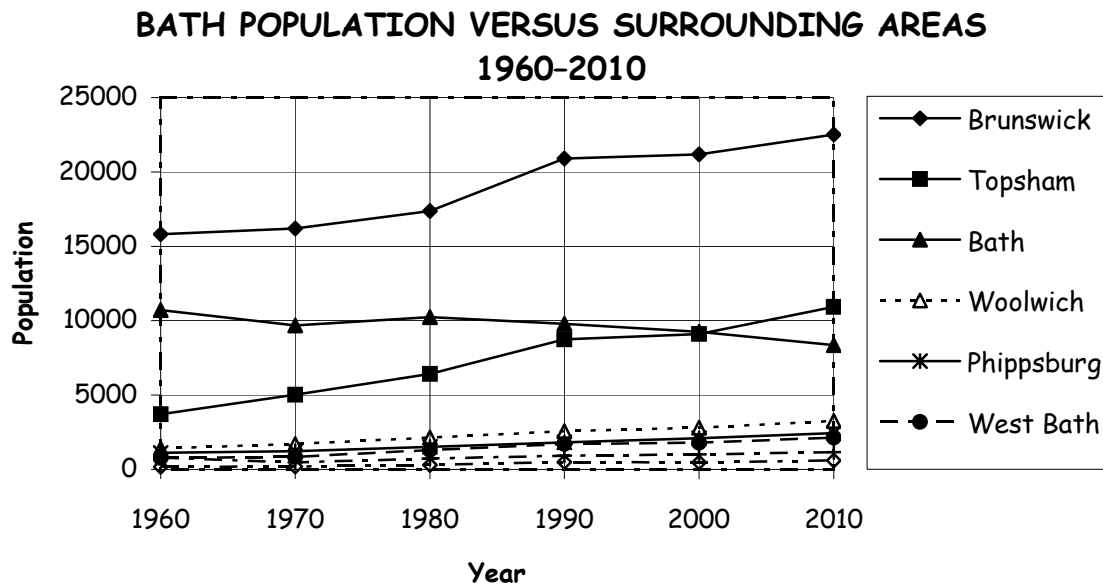
DAILY AND SEASONAL CHANGES IN POPULATION

As discussed in Appendix B, the Economy Inventory, there are many more workers who commute to rather than from Bath. Also, in the summer, and especially when neighboring coastal towns are fogged in, Bath experiences a sizable influx of shoppers. The daytime population, although difficult to measure exactly, is considerably more than the U.S. Census number of 9,266. This significantly impacts certain public services such as the size of the police force and fire and rescue services.

The City of Bath has a small number of seasonal dwellings (see Appendix C, Housing Inventory). The seasonal population is not significantly greater than the year-round population except for summer daytime visitors.

REGIONAL POPULATION

In recent years, as the City of Bath has been losing population, the towns around Bath have been gaining population. This same population shift has been occurring in and around other urban (although larger) Service Center communities such as Bangor, Waterville, Augusta, Lewiston, Auburn, and Portland.

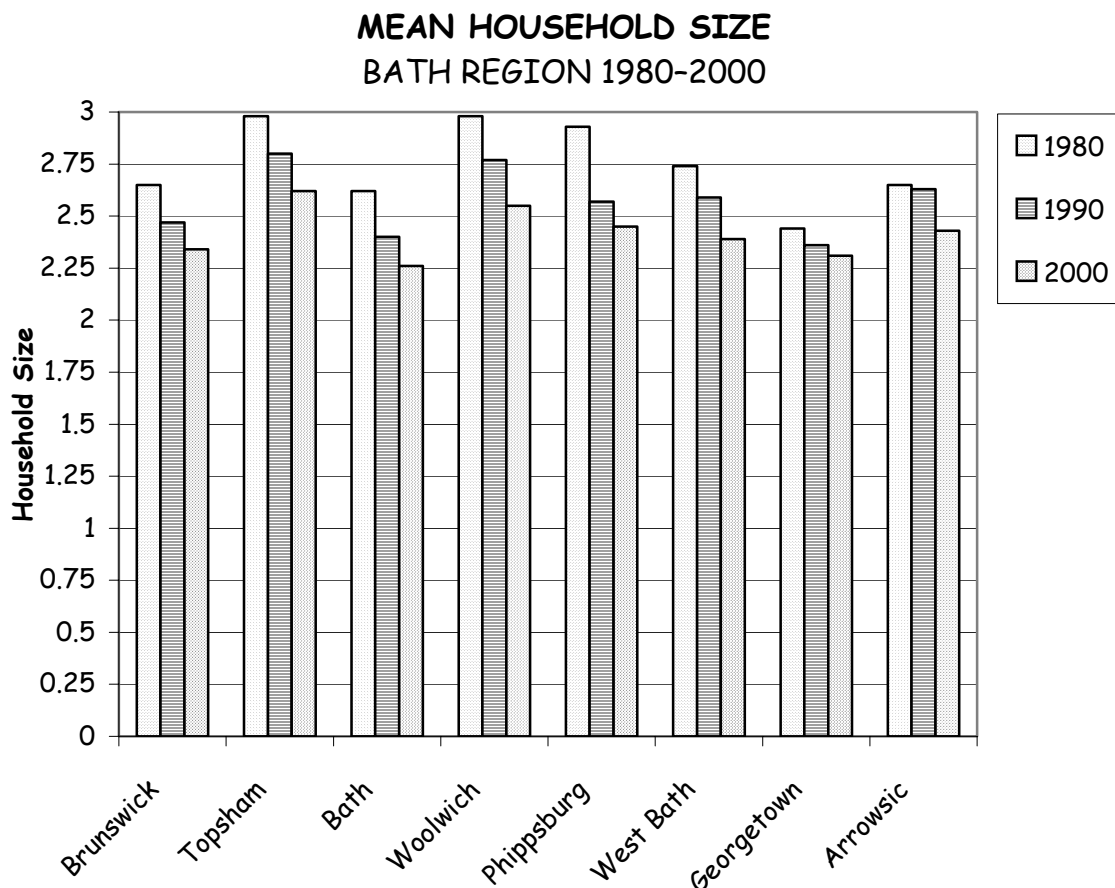


Sources: 2000 U.S. Census; forecast by Maine State Planning Office, 2003

The graph shows that the smaller Bath Region towns are growing at rates similar to one another. The larger towns of Brunswick and Topsham are growing more rapidly than the smaller towns, and the rates almost mirror each other. The SPO predicts that Topsham will grow somewhat faster than Brunswick in the future.

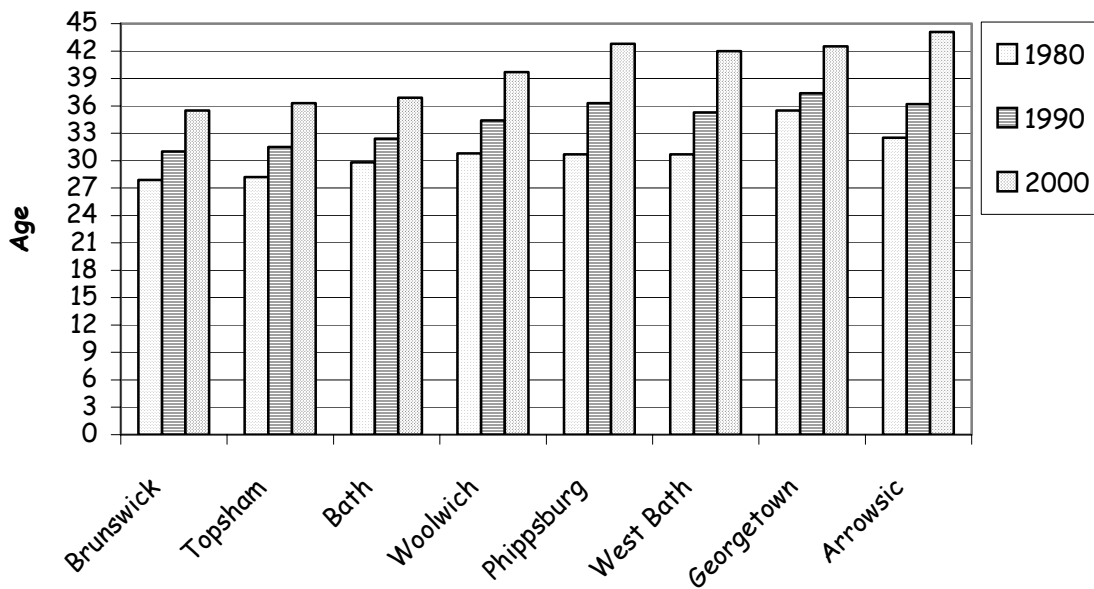
Just looking at Bath and the five towns around it (not including Brunswick and Topsham), significant growth took place between 1980 and 1990; however, this growth slowed between 1990 and 2000. Still, there were more people living in the Bath Region in 2000 than in 1990, even with Bath's decline of more than 500 people.

The characteristics of the population of the Bath Region are changing. The following two graphs show the median age of the population of the towns for 1980, 1990, and 2000, as well as the mean household size for the same years.



Source: U.S. Census

MEDIAN AGE BATH REGION 1980-2000



Source: U.S. Census

POPULATION DENSITY

Another interesting characteristic of the population of Bath and the Bath Region is the density of the population. The City of Bath's 9,266 people (i.e., the 2000 population) were occupying less than 10 square miles, which is a population density of almost 942 people per square mile.

The following table shows the population density for Bath, the Bath Region towns, and selected Service Center communities in 2000.

**POPULATION DENSITY
BATH, BATH REGION, AND
SELECTED SERVICE CENTER COMMUNITIES
2000**

Town/City	Population	Area in Square Miles	Population per Square Mile
Bath	9,266	9.84	941.6
Arrowsic	477	8.85	53.9
Brunswick	21,172	49.73	425.7
Georgetown	1,020	19.62	52.0
Phippsburg	2,106	30.96	68.0
Topsham	9,100	33.19	274.2
West Bath	1,798	12.33	145.8
Woolwich	2,810	37.60	74.7
Auburn	23,205	61.67	376.3
Augusta	18,560	57.35	323.6
Bangor	31,473	34.59	909.9
Lewiston	35,690	36.83	969.1
Portland	64,249	19.15	3355.0
South Portland	23,324	12.93	1803.9
Waterville	15,605	15.27	1021.9

Sources: 2000 U.S. Census; Maine State Planning Office; City of Bath Planning Office

BATH POPULATION FORECAST

Making many assumptions about population trends (i.e., mean household size, occupancy rate, and number of people living in group quarters), an estimate of the 2007 population of Bath was developed and is shown in the following table. (As discussed previously, in 2007, twenty-five new dwelling units were permitted; however, as of October 2008, only five had been constructed. Given the 2008 economic and housing situation, 2008 numbers have not been used in the population estimate and forecast. If the economic and housing situation continues in 2009, a new estimate and forecast is recommended.) The method used would be considered an extrapolation technique. Using this technique, a population decline since the 2000 U.S. Census count is estimated.

BATH POPULATION ESTIMATE 2007

2000 year-round housing units	4,315
New year-round housing units 2000-2006	+ 77
Year-round housing units 2007	= 4,392
Assumed occupancy rate 2007	x 92.2%
Estimated year-round households 2007	= 4,049
Assumed persons per household 2007	x 2.12
Assumed persons living in households 2007	= 8,584
Assumed persons living in group quarters 2007	+ 118
Estimated population 2007	= 8,702

Sources: 2000 U.S. Census; City of Bath Planning Office

Using the same method, the population for 2010 was projected, which is shown in the following table. Again, it shows a population decline.

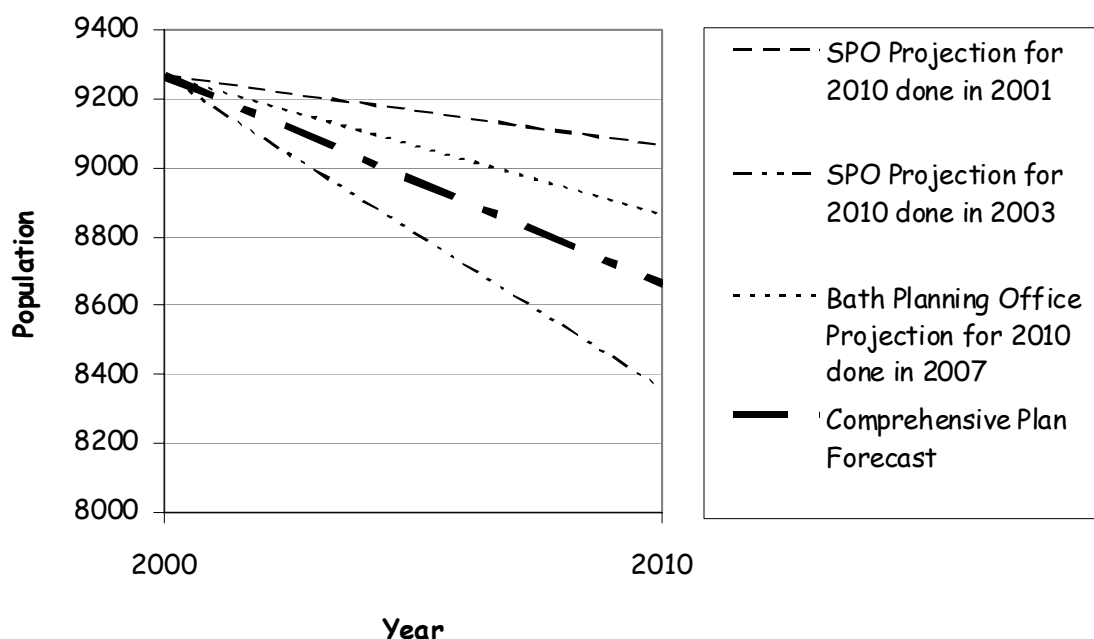
BATH POPULATION PROJECTION 2010

2000 year-round housing units	4,315
Assumed year-round housing units 2000-2010	+ 110
Assumed year-round housing units 2010	= 4,425
Assumed occupancy rate	x 92.2%
Assumed year-round households 2010	= 4,080
Assumed persons per household 2010	x 2.07
Assumed persons living in households 2010	= 8,446
Assumed persons living in group quarters 2010	+ 118
Population projection 2010	= 8,564

Sources: 2000 U.S. Census; City of Bath Planning Office

The following graph shows the SPO projections of Bath's 2010 population done in 2001 and in 2003 and the City of Bath Planning Department projection done in 2007. The population forecast most likely to happen according to this Comprehensive Plan is also shown.

BATH POPULATION PROJECTION AND FORECAST TO 2010



Sources: Maine State Planning Office; City of Bath Planning Department

PLANNING IMPLICATIONS OF THE DEMOGRAPHICS INVENTORY

1. The size of Bath's population has remained relatively unchanged (except for a large temporary increase in 1920) for the last 100 years, hovering just above or just below 10,000 people. It has been declining since 1980 and this decline is forecast to continue into the near future.
2. Surrounding towns have grown in population. In some cases, this growth has been substantial, at least in percentage terms.
3. Bath's population decline is due to a combination of various factors:
 - Bath's relatively small size in land area
 - higher tax rate in Bath compared to neighboring rural towns
 - relatively high density of population in built-up parts of the City
 - decreasing household size

4. A key trend that affects demand for housing, community facilities, and services such as schools is the aging of Bath's population.
5. Trends in percentages show Bath is growing significantly in the 45- to 64-year-old age groups and losing population in the under-45-year-old age groups.
6. Based on recent trends, the number of school-aged children (i.e., ages 5-17) is predicted to decline in the future. This trend can strain the maintenance of enrollment levels in public schools and the levels of public facilities and services for senior citizens in later years.
7. Data from the 2000 U.S. Census (i.e., 1999 income data) show that Bath lags behind the remainder of the Bath Region in family income and has a larger percentage of families living below the poverty level. Bath also has a relatively high percentage of family households headed by single mothers with children under the age of eighteen. These factors strain the families as well as many of the City's public facilities and services.