LOCAL GOVERNMENT GUIDE TO POPULATION ESTIMATION AND PROJECTION TECHNIQUES

A Guide to Data Sources and Methodologies for Forecasting Population Growth

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About the Florida Planning and Development Laboratory

The Florida Planning and Development Laboratory (FPDL) was created in 2003 to reflect the Department of Urban and Regional Planning's responsibility to chronicle, examine, and reflect planning practice within the State of Florida. The FPDL is designed to support planning efforts and improve planning practice both within Florida and elsewhere. The FPDL is housed administratively and physically within the Florida State University Department of Urban and Regional Planning.

PURPOSE OF THIS REPORT

Chapter 9J-5 of the Florida Administrative Code contains the minimum criteria for review of local comprehensive plans. This rule specifically states that the "comprehensive plan shall be based on resident and seasonal population estimates and projections". Since many of the elements of each jurisdiction's comprehensive plan are directly or indirectly based upon the future population of an area, most especially the Future Land Use, Transportation, Capital Facilities, and Housing elements, accurate population estimates and projections are critical for assessing future needs for services and ensuring that the local comprehensive plan effectively guides development.

As per state statute, local planning agencies have the option of using official state population projections data or developing their own population estimates and projections. Any local government that chooses to use its own methodology is required by Chapter 9J-5 to submit a "description of the methodologies utilized to generate the projections and estimates". The intent of Chapter 9J-5, FAC, is that each local government's demographic effort be based on a logical, well-founded method of forecasting population growth. There are, in fact, many acceptable methodologies which may be used, and the intent of this document is permissive in that regard.

This guide is intended to provide an overview of the population estimation and projection process. The document describes where data on population and development trends can be acquired, details the methodology behind the state's official population projections, and summarizes alternative methodologies that can be used by local planning agencies to estimate and project resident populations. The guide is aimed at a professional planning audience, with a primary goal of acquainting planners with several simple means of forecasting population figures when trained specialists are not available for such a project.

SECTION 1.0 INTRODUCTION

> "*The future is generally considered to be a core concern of the planning profession. A central purpose of planning is to make decisions in the present that will guide future activities designed to make improvements for the benefit of the future community.*"
>
> Dowell Myers (2001, p. 365)

The success of local government comprehensive planning depends to a great extent on the accuracy of population estimates and projections. The rate of population growth within a community will determine future requirements for housing, transportation, recreation, schools, and other public and private facilities. Local planning agencies, therefore, should attempt to forecast as accurately as possible their projected growth by using the most appropriate techniques and methodologies and by applying their best professional judgment to the analysis of prevailing local conditions.

1.1 Understanding Population Change

The three components of population growth are births, deaths, and migration. By combining birth figures with mortality figures for a given area, planners can estimate the natural increase (or decrease) in a population. Data are readily available for estimating historical fertility rates and mortality rates, and these may be applied to local demographic information to compute projected natural increases, if desired. The third component, migration, is a much more elusive commodity. Net migration figures are the result of balancing in-migration and out-migration figures. In the case of Florida's local governments, which are facing volatile growth rates, this will be the predominant and most complex component of change.

Migration rates, additionally, are tied strongly to economic conditions and can be correlated with such variables as available labor force, per capita income, unemployment rates, and cost of living levels. Florida's migration figures are also determined in large measure by environmental factors, such as quality of life, temperate climate, and recreational opportunities. One can readily understand the state's booming population growth when viewed in these terms, while also realizing that the same factors would tend to moderate growth through migration in certain stabilized communities.

1.2 Population Forecasting Terminology

1.2.1 Estimates, Projections, and Forecasts

A key first step in producing useful and accurate forecasts is to ensure that planning staff understand the differences between estimates, projections, and forecasts. These terms are often used interchangeably (and therefore incorrectly) by planners, public officials, and the public.

Figure 1.1. Distinguishing Estimates, Projections, and Forecasts

Estimate: The calculation of a current or past value of a variable, typically based upon symptomatic indicators of change in that variable.

Projection: The numerical outcome of a particular set of assumptions regarding future values of a variable. A projection is essentially a conditional "If …, Then…" statement about the future.

Forecast: The projection selected as the one most likely to provide an accurate prediction of the future value of a variable. Forecasts are a judgmental statement about what the analyst believes to be the most likely future.

It is essential that planners understand that a population *estimate* is not the same as a population projection or forecast. An estimate attempts to define population for a specific time in the past, such as a period midway between the last two census counts – an "intracensal estimate", or for a specific date at or near the present. A *projection*, on the other hand, is a prediction about future population levels, conditioned upon a set of assumptions. The accuracy of the projection is directly affected by the validity of the assumptions underlying a projection; accurate assumptions yield accurate projections. Lastly, a *forecast* is the analyst's "best guess" about future population levels given their analyses of population trends, development trends, and other factors affecting the community of interest. A population forecast is typically derived from a series of population projections, with the analyst identifying a single projection (or combining several separate projections), and re-labeling this the forecast, which represents the analyst's prediction of future population levels in the area of interest.

1.2.2 Additional Forecasting Jargon

In addition to the above terms, it is useful to establish terminology that help to understand the methods utilized to generate population projections and forecasts. These terms provide a common language for describing the input data (base year, launch year, base period) and the outputs of the methodologies (target year(s), projection horizon(s), and projection interval(s)). These terms are derived from Smith, Tayman, and Swanson (2001). Figure 1.2 defines these terms and Figure 1.3 illustrates how these terms are used in a projection exercise.

Figure 1.2 Summary of Forecasting Technical Terminology

Base Year: The year of the earliest data used in the projection. In Figure 1.3, the Base Year for these projection series is 1940.

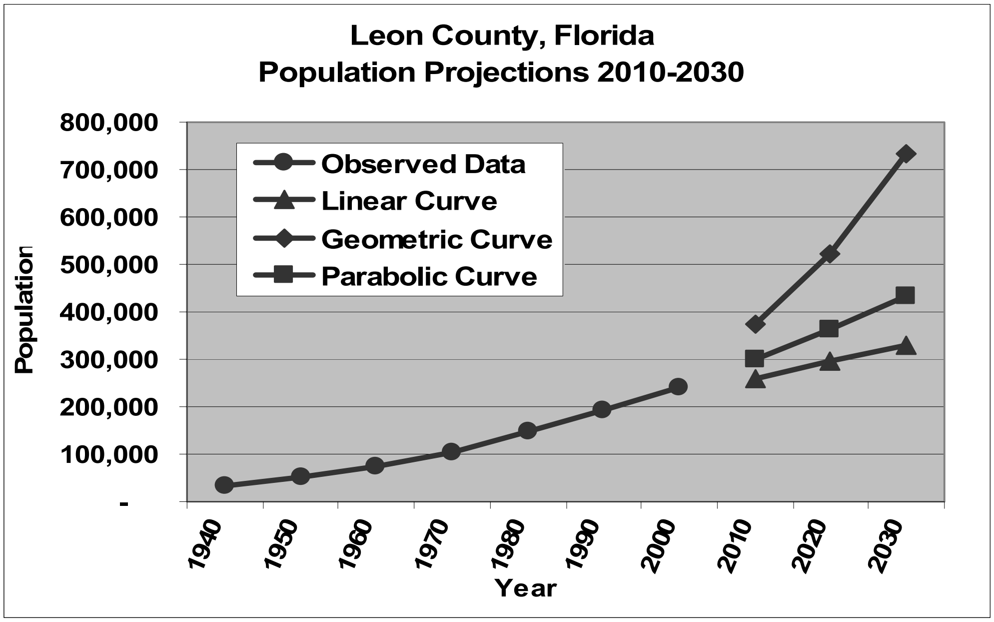
Launch Year: The year of the most recent data used in the projection. In Figure 1.3, the Launch Year for these projection series is 2000.

Base Period: The interval between the base year and the launch year. In Figure 1.3, the Base Period for these projection series is 1940-2000

Target Year(s): The year(s) for which population is projected. In Figure 1.3, the Target Years for these projection series are 2010, 2020, and 2030.

Projection Horizon(s): The interval between the launch year and the target year. In Figure 1.3, the Projection Horizons for these projection series are 2000-2010, 2000-2020, and 2000-2030.

Figure 1.3 Example Projection Results for Leon County



1.3 Geographic Issues in Population Forecasting

Each county and the municipalities located within each county must work together to ensure the total county population is appropriately apportioned between municipalities and the unincorporated county. In practical terms, this means that all individual city estimates and projections for a given time period, plus figures for unincorporated areas, should aggregate to the total county figure provided by official state data sources for the same time period. This will require a mechanism, mutually acceptable to the county and the several municipalities within the county's jurisdiction, whereby each unit agrees to use a proportionate share of the forecast population data in accordance with rational formulas for such pro-ration. This is not to say that historical proportions will necessarily apply for current and future time periods, but the responsibility for allocating populations must be shared by all local governments. Moreover, a determination of these formulas and allocation procedures must be made early in the planning process in order to preclude individual cities from possibly forecasting a grossly disproportionate share of its county's population. Failure to agree on this point could conceivably lead to distortions in internal population totals and, as a result, to inaccuracies in assessing the needs for infrastructure and services to support these populations.

Additionally, each county has a responsibility to generally control its population forecasts to a proportionate share of the official state total figures. Rule 9J-5 permits the county to use a high or a low projection figure from official state-provided sources, rather than the medium figure, so long as a "detailed description of the rationale" is provided to explain this section. Note that, in this case, the methodology need not be explained, since the figures themselves are from official state sources. However, to select other than the medium projection figures implies that the county has factored in certain assumptions which lead it to believe that its growth rate will exceed or lag the state's best forecast for the time period in question. There is nothing inappropriate in this process – indeed, the local planning agency may well have the better judgment and knowledge of local conditions – but, from the Department's perspective, all 67 counties must roughly aggregate to the state-wide total and, without rationale for using non-standard figures, the individual county's assumptions might be questioned during the review process.

1.4 Rules of Thumb for Population Forecasting

1.4.1 The Suitability of Input Data is Important

Both population estimates and projections, which are based on historical data series, rely upon statistical methods for their computations. The local planner, regardless of the methodology chosen, must ensure that they are using sound statistical procedures. For example, if the projection is to be made for fifteen years into the future, then at least fifteen years of historical data should be used as the basis for the projection. Also, at least three population counts from the past census enumerations (i.e. 1980, 1990, 2000) should be used whenever possible. Adherence to these qualities will normally yield more reliable results.

1.4.2 Methodological Complexity Does Not Increase Accuracy

It is important to understand that increased sophistication in projection methodology does not necessarily produce greater accuracy (Smith 1997). Some of the more complex models are designed to analyze voluminous amounts of data in order to yield detailed projections for specific age-sex-racial groups (or cohorts). Such detailed information at the county and city level, if generated through local resources, is likely prohibitively expensive to produce and, further, may be of questionable value for the general needs of the local planning agency. More importantly, all evidence indicates that projections based upon more complicated methodologies (such as the cohort-component and economic-demographic models) are not necessarily any more accurate than those produced by simpler methods (extrapolation or ratio techniques), which are feasible for any level of local government.

1.4.3 Accuracy Does Increase with Certain Characteristics

Demographers are in agreement that forecasting accuracy tends to increase as:

1. the size of the population group being observed increases (e.g., a projection of Florida's total population is typically more accurate than a projection for a single county),
2. as the projection time period decreases (forecasts for a ten year period are more accurate than a thirty year period), and
3. as the level of migration decreases (projections tend to be more accurate for slow growing counties than fast-growing counties).

These demographic principles result from the concept that changing conditions (economic, social, political) cause a shift in trends over time and these changes tend to affect smaller population groups more radically. Of fundamental importance to planners in Florida is the concept that *the local planning official who is prepared to recognize, analyze, or attempt to understand these changes will be able to more accurately project his community's growth rate*.

For example, a city which has largely built out its corporate limits and which plans no additional annexations, could reasonably expect its population growth projections to be fairly accurate over the next ten to fifteen years, barring any drastic changes in population densities, economic conditions, or environmental quality. On the other hand, a city with numerous large undeveloped areas, one that is actively attracting new industry, and one which currently enjoys a relatively low cost of living, could experience very high migration rates and, hence, a sizeable loss in accuracy in its population projections, even for a very short range forecast.

1.4.4 Forecasting is an Inaccurate Science

Despite the availability of very high quality data, powerful computers and software, and detailed, nuanced methodologies, it is essential that planners and public officials understand that population forecasting is an inaccurate science. Predictions about the future of any measurable outcome (be it weather patterns, system traffic levels, the economic performance of a company, or population levels in a county) rest upon a foundation of imperfect information, environmental uncertainty, and limited understanding of human behavior.

Planners and demographers attempt to predict the future based upon information about current population levels and ongoing development trends, but this information base is not and can never be perfect. This limited current information base is coupled by a fundamental lack of knowledge concerning future events and/or technological changes. Hurricane events, such as Katrina in New Orleans, can devastate a city or county and change regional population patterns almost overnight. New technology can make inhospitable places much more desirable as places to live and recreate; the proliferation of air conditioning was a major factor in the state of Florida's growth during the latter half of the Twentieth Century. Planners and demographers simply are incapable of predicting major events, like hurricanes, or major technological advancements, like air conditioning. Lastly, planners and demographers are hampered by a limited understanding of human behavior. While planners might reasonably expect that a combination of greater densities, mixed uses, and the presence of bike/pedestrian infrastructure will promote increases in walking and biking as modes of travel, these behaviors must be undertaken by individuals and, as history shows, individuals often do not behave as expected.

Combined, then, these factors yield population forecasts that are often well off the mark. For example, the county level population projections prepared by the Bureau of Economic and Business Research (BEBR) in 1980 for the year 2000 were, on average, off by 17%. Planners and demographers with experience in generating population forecasts recognize that a certain level of error is expected. Errors are inherent to any effort that is based upon imperfect information, uncertainty about the future, and a limited understanding of how and why people behave the way they do.

1.5 Why Forecast? The Utility of Population Forecasting for Planners

Given the fact that most population forecasts are incorrect, often missing the mark by a substantial percentage, it seems reasonable to inquire:

Why undertake population forecasts at all?

The foremost reason that planners in Florida undertake population forecasts is that these forecasts are required by the state. Under the Florida comprehensive planning approach a fundamental obligation of the planner is to continually monitor the various changes within their community and to assess the possible impacts of these changes in future population levels. The viability of the comprehensive plan is measured in terms of its ability to accommodate increasing population, and failure to foresee a period of explosive growth can render a plan ineffective as a growth management tool. Population forecasts are the foundation upon which comprehensive plan policies are developed, infrastructure systems are designed and built, and the future land use map is drawn.

However, it is essential that planners recognize that forecasts are valuable for other reasons as well. Population forecasts, even if they under-project or over-project a population by a certain percentage, are valuable because they:

- **Help planners to understand the determinants of population change**: Understanding how and why a local population is changing is fundamentally important to planners and public officials. Analyses of population changes and projections of future population changes allow planners to react to and plan for ongoing changes in the community. Because population changes are indicators of the economic and social health of communities, the forecasting process offers a prime opportunity to develop a more nuanced understanding of the forces affecting the community.
- **Sound warnings about impending problems**: Population forecasting is very valuable as it can send signals of an impending problem or crisis. For example, when population forecasts are linked to water demand or wastewater generation, a planning staff can identify shortages in water supply or wastewater treatment facilities years in advance of these problems. Population forecasting therefore represents planning at its most successful, with an anticipation of community needs and the subsequent development of

policy responses and infrastructure investments to meet these needs in an efficient and timely fashion.

- **Help to illuminate alternative futures**: Population forecasting is valuable as an input into the planning process. Population forecasts can provide a focus for major planning efforts and/or facilitate debate about the nature of growth and development in the community.
- **Promote fact-gathering and community input**: Lastly, if a population forecast is generated through a scenario building exercise (detailed in Section 4.0), then the process itself represents a tremendous learning opportunity for the planning staff and the local community more generally. The process of gathering data to document existing conditions and ongoing development trends provides a rich and detailed base of information that informs the population forecast, but also many other planning initiatives.

While most planners, public officials, and the public at large typically focus upon the actual outputs of the population forecast, there are many ancillary benefits of undertaking a forecasting process. Beyond meeting statutory requirements to plan for and accommodate the projected population for the area, the forecasting process makes for better informed, better connected, and more forward looking planning staffs. These benefits should not be lost in the minutia of the data inputs and the methodologies employed to generate a forecast.

SECTION 2.0 GUIDE TO KEY POPULATION DATA SOURCES

An important planning consideration to keep in mind is that population estimates and projections can, and should, be revised whenever more current or accurate data becomes available. Most relevant to any demographic effort, of course, is the decennial U.S. census, which provides the most detailed and accurate statistics available. When the 2010 census is published (approximately mid-2012), planners at all levels will be able to update their present population forecasts and, in turn, re-evaluate the adequacy of their comprehensive plans. In the meantime, the 2000 Census remains the best database upon which to build population forecasts. Official, state-generated demographics data are derived from the 2000 census count and are updated periodically by means of sophisticated methodologies and inputs from federal, state, and local agencies. The state estimates and projections become, in turn, the best available data for the local planner's purposes, since they are the most current.

In order to accomplish meaningful and accurate population estimates and projections, the planner must choose the optimal methodology for their purposes and then obtain the data necessary to employ this methodology. The following are the recommended sources of data that should be consulted when undertaking a population projection exercise.

2.1 U.S. Bureau of the Census

2.1.1 Decennial Census

The United State Census Bureau has conducted a Decennial Census since 1790, as required by the Constitution of the United States. This enumeration of the American population occurs on April 1 of every year ending in zero (1980, 1990, 2000, etc.). These data are used to allocate seats in the U.S. House of Representatives and to allocate funding from a variety of federal programs (over $200 billion annually). The Census Bureau spends billions of dollars in an effort to locate and count every American citizen, as well as legal and illegal immigrants in the borders of the United States. The Decennial Census represents one of the most ambitious, expensive, and successful data gathering exercises on the planet. For an excellent overview of the Decennial Census, see the document *Census 2000 Basics* (U.S. Census Bureau, 2002, available online at http://www.census.gov/mso/www/c2000basics/00Basics.pdf).

Beyond its constitutionally-mandated use, the Decennial Census has also traditionally been an extremely valuable dataset for state and local governments. The Census collects data on a wide ranging set of topics, many of which are of direct interest to planning practitioners, including household and personal income, mode and travel time to work, and housing characteristics. Data from the Decennial Census has been an integral part in the successful development of comprehensive plans and other local planning efforts in Florida and elsewhere.

Up until recently the Census Bureau had conducted the Decennial Census through two different survey instruments. The "short-form" gathered very basic information on each person in a household (age, gender, race, ethnicity, tenure status (owner vs. renter)). This information is captured for every person enumerated by the Census. The "long-form", which in 2000 was answered by roughly one in six households, included the short-form questions as well as a long list of additional questions. It is this sample data that lies behind much of the rich dataset that is the Decennial Census. Information is captured on individuals (educational attainment, citizenship, residence five years ago, etc.) as well as on the housing unit (age, value, number of rooms, etc.).

Because of the comprehensiveness of the data gathering effort and the very high quality of the data provided by the Census Bureau, these data have traditionally been the backbone behind local planning analyses and local comprehensive planning efforts. Further, as these data came available with each succeeding Census, local governments could update their socio-demographic data and analyze how their communities had changed in the intervening years. When it comes to any population-related analyses, including forecasting, the Decennial Census still represents the first and best dataset for undertaking this work.

However, the 2010 Census marks a major change to the Census Bureau's approach to the Decennial Census. For 2010 the Census Bureau has chosen to utilize only the short-form; the long-form data will no longer be collected during the Decennial Census. Instead, the Bureau has moved to the long-form questions to the *American Community Survey*. For more on the American Community Survey, see the following section.

2.1.2 American Community Survey

Beginning in 2005, the Census Bureau began an effort to obtain those data that were typically gathered on the "long-form" via a new American Community Survey (ACS). This data acquisition effort represents a major new source of valuable and quality data for planning professionals as they analyze population changes and forecast population sizes and population compositions. For an excellent overview of the strengths and weaknesses of the ACS, see MacDonald (2006). In addition, the Census Bureau's American Community Survey website provides excellent information about the ACS, its design, and guides on how to use these data. (http://www.census.gov/acs/www/)

When compared to the long-form model of data acquisition, the ACS has one significant advantage, timeliness. Because the ACS undertakes a survey of 3 million households each year, data for counties and sub-county areas are now available on an annual basis, providing much more accurate data to planners and public officials on things such as poverty rates and income levels, travel modes and commute times, and housing and household characteristics. No longer must planning staff utilize data on socioeconomic conditions from as many as ten years ago (the last Decennial Census). Instead, once it has been completely implemented the ACS will provide these data to users on an annual basis.

However, users of these data must recognize that the ACS has traded one advantage (timeliness) for one disadvantage (precision). Whereas the long-form of the Decennial Census surveyed one in every six households, or roughly 16 million households in 2000, the ACS annually surveys a much smaller number of households, roughly 3 million. A consequence of this smaller sample size is larger measurement error, especially in the cases of less populous communities and rural counties and for racial and ethnic groups that are a small percentage of a population (MacDonald, 2006). However, the fact that ACS data are less precise than the long-form data does not suggest that planners steer clear of these data. Rather, this fact reinforces the need to ground truth these data and triangulate key findings by using a range of data sources when undertaking analyses of local and regional population trends.

2.2 Bureau of Economic and Business Research (BEBR)

The state of Florida annually contracts with the University of Florida's Bureau of Economic and Business Research (BEBR) to update and produce population estimates and projections for the state and its component counties. According to the BEBR website (http://www.bebr.ufl.edu):

> *BEBR began making population estimates for Florida and its counties in the 1950s. The Population Program was formally established in 1972 when BEBR received the first of a continuous series of annual contracts from the State of Florida to produce the state's official city and county population estimates.*
>
> *The Population Program continues to produce Florida's official city, county, and state population estimates each year. These estimates are used for state revenue-sharing and many other planning, budgeting, and analytical purposes. The program also produces estimates of households and average household size and projections by age, sex, race, and Hispanic origin for the state and each county.*

Consequently, BEBR represents the primary population projections data source for the state and for local governments in Florida. BEBR produces the state's official population forecast, with annual updates that reflect changing conditions and incorporate the most recent population estimates.

As a matter of policy, DCA has encouraged local governments to utilize BEBR population projections to help meet their statutory requirement to account for and plan for their projected populations. BEBR's figures are generally accepted as a reasonable and appropriate set of population projections for use by local governments in the state. In contrast, if local governments wish to use a different population projection, DCA requires local governments to document how these projections were developed.

2.2.1 BEBR's Population Projection Series

BEBR actually produces several different population estimates and projection series.

1. *State of Florida Estimates of Population*: BEBR annually produces official population estimates for cities, counties, and the state. These estimates represent the best available state data on current population levels in the state.
2. *State of Florida Population Projection*: BEBR annually produces a state-level population projection that provides a roughly 25 year forecast of the state population (for example,

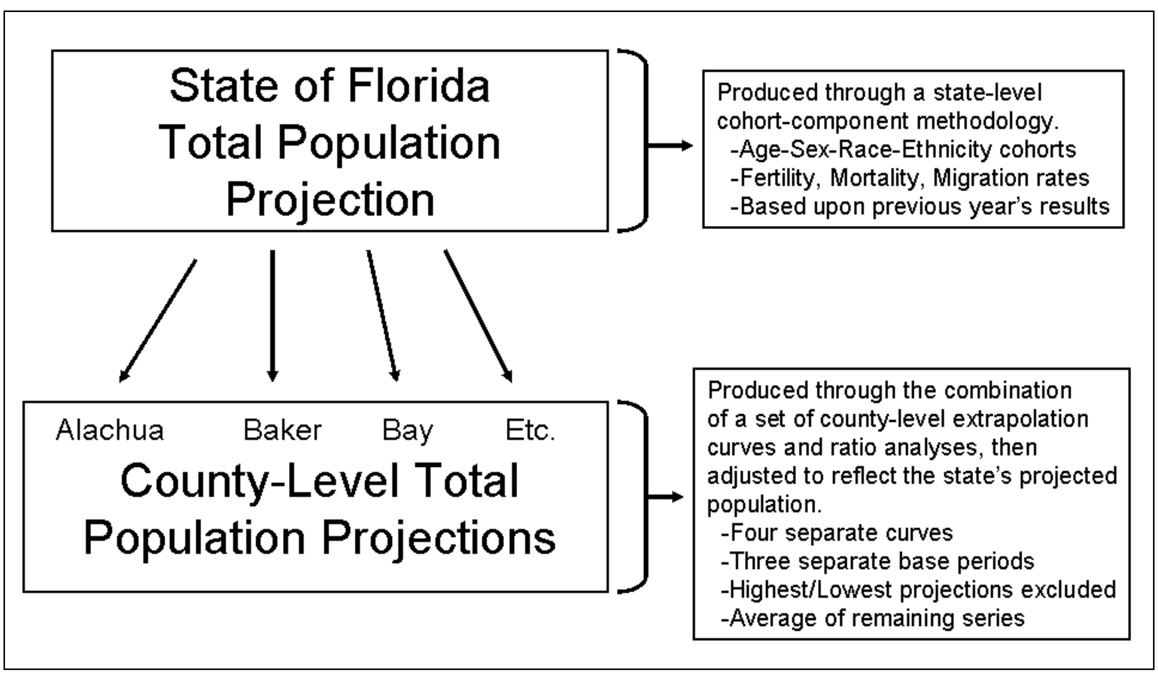
for the period 2005-2030). Based upon a cohort component technique, this series provides figures for the total number of permanent residents, as well as the number of people in different age-sex-race-ethnicity cohorts (for example, black, non-Hispanic males aged 10-14)

3. *County Total Population Projection*: BEBR annually produces a set of county-level population projections that provide a roughly 25 year forecast of each county's population. This is the projection series most often used by county and sub-county governments for planning purposes.
4. *County Population Projection by Age-Sex-Race-Ethnicity Cohorts*: BEBR has also begun producing county-level projections by age-sex-race-ethnicity cohorts.

2.2.2 How BEBR Generates Their Total Population Projections

It is important for local governments to understand the process by which BEBR produces their annual total population estimates and projections. Figure 2.1 provides a summary of the BEBR methodology for producing projections of the state and county total populations. For more detail, readers are directed to the summary methodology overview produced by BEBR, *Methodology for Constructing Projections for Florida and Its Counties*.

Figure 2.1 Summary of BEBR's Population Projection Approach



State Projections: State-level projections are based upon a cohort-component methodology in which births, deaths, and migration are projected separately for each age-sex cohort in Florida, by race (white, nonwhite) and ethnicity (Hispanic, non-Hispanic). To reflect expected increases in life expectancy, survival rates are adjusted upwards over time, while fertility rates are adjusted downwards, also reflecting a longer-term trend in the United States. In addition, BEBR staff separate out domestic and international in-migration and out-migration rates. To account for uncertainty over migration rates, BEBR weight in-migration rates using different multipliers. When the different components are combined, BEBR produces Low, Medium, and High population projection series for the state.

County Projections: In part because of limitations to applying the cohort-component method to Florida's smaller counties, county-level population projections are produced using a combination of extrapolation and ratio techniques. For counties, BEBR currently uses a set of four techniques (linear curve, exponential curve, share of growth, and shift-share) and different historical base periods (ranging from 5-15 years). Population projections are produced using each method, with the highest and lowest projections for each county being excluded from further analyses. Each county's medium population projection is the average of the remaining projections. However, BEBR does adjust the county projections to be consistent with the total population change projected at the state level, resulting in some minor adjustments to projections for most counties. Lastly, BEBR staff do take into account "special populations" (prison inmates, military personnel, and university students) in numerous counties to account for local conditions that might not be adequately captured in the techniques employed.

It is important to note that the official state population figures published by BEBR include only data by individual county, they do not break out the unincorporated areas of the county. For purposes of analyzing incorporated versus unincorporated areas, or analyzing service districts within the county, each county must allocate population among its municipalities, unincorporated areas, and/or special districts.

2.2.3 How BEBR Generates Their Cohort Population Projections

Summarized below is the BEBR methodology for producing cohort-based population projections for all counties in the state. For more detail, readers are directed to a summary methodology overview annually produced by BEBR, *Methodology for Producing Population Projections by Age, Sex, Race, and Hispanic Origin for Florida and Its Counties*. It is important to note that these projections do not represent the official population projections by BEBR. Instead, this projection series is intended to provide insights into the age-sex-race-ethnicity make-up of the counties in the state over time.

> County-Level Age-Sex-Race-Ethnicity Cohort Population Projections: BEBR uses a combination cohort-component and extrapolation/ratio-based methodology for this projection series. These projections are produced for the three largest racial/ethnic groups in Florida; non-Hispanic whites, non-Hispanic blacks, and Hispanics. Using a variety of extrapolation and ratio techniques, BEBR first projects the total population by race/ethnicity (non-Hispanic whites, non-Hispanic non-whites, and Hispanics) through the projection horizon. Then county-level cohort-component models are utilized to generate population projections by cohort over the projection horizon.

2.3 Local Data Sources

Virtually every local government planning agency maintains or has access to a variety of data that are useful as indicators of population growth and demographic changes. Among the data most useful for tracking changes in a local community are: school enrollments, birth and death registrations, utility (telephone, water, and electricity) customers, housing permit applications, and voter registrations. Called "symptomatic indicators", these data can help planning staff track past and current trends, as well as provide vital inputs into forecasting formulas, as they are "symptoms" of population change. Local planners can generally make direct correlations between these symptomatic data and population growth rates. These data are also very useful inputs in the development of a population forecasting scenario building exercise (discussed more in Section 4.0).

SECTION 3.0 POPULATION FORECASTING METHODOLOGIES

This section describes, in general terms, the currently recognized methods by which population estimates and projections are made. An in-depth definition and sample calculation for each are beyond the scope of this guide, but the reader will be referred to recommended sources for further detail. Emphasis will be placed on the two types of methodologies which are appropriate to the majority of local planning agencies.

With regard to the provisions of Chapter 9J-5, the methodology groups listed below, including any of these subcategories or variations listed herein, or any composite form of these methodologies, such as averaging the results from two or more methodological approaches, will be considered by the Department to be professionally acceptable.

3.1 Population Estimation

Population estimates are concerned with present-day conditions. For the planner's purpose, a current estimate attempts to show "today's population figures", and is derived from the latest census count. The three main groups of estimation methodologies are:

a) Mathematical Extrapolation
b) Ratio, and
c) Cohort-Component

Annual estimates of current population are published annually by the Bureau of Economic and Business Research (BEBR) for both cities and counties, and these estimates are recognized as the state's official data. Using BEBR estimates, then, as the basis for the comprehensive plan constitutes compliance with Rule 9J-5, and all local governments are encouraged to do so. Should the local government choose to develop its own estimates in lieu of BEBR data, however, there are several available techniques under each methodology which are considered to be professionally acceptable. Examples are the arithmetic, geometric, and logarithmic variations of the extrapolation methodology. Also, ratio-based techniques such as pro-ration, apportionment, direct ratio, vital rates, administrative records, ratio-correlation, and the housing unit method are acceptable. The cohort-component method has few variations, but among them are the adjacent cohort technique, Component Methods I and II, and composite techniques of using extrapolation or ratio methods in conjunction with cohort-component data.

3.2 Population Projection Methodologies

The four major categories of projection methodologies are:

a) Mathematical Extrapolation Techniques
b) Ratio Techniques
c) Cohort-Component Method
d) Economic-Demographic Models

Each type has its distinctive advantages, limitations, data requirements, level of complexity, and applicability to the professional planner. For local government purposes, the mathematical extrapolation and ratio techniques are recommended and the most likely to be employed by local governments. These techniques have low data requirements, are simple to employ, and are capable of yielding accurate and useful results in a timely fashion. A brief description of each of these methods follows. For a much more detailed discussion of these methods, the reader is directed to two books:

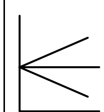
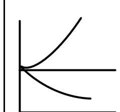
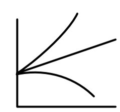
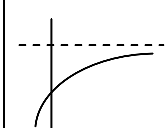
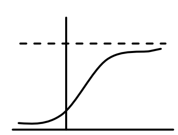
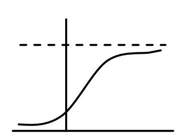
1) *State and Local Population Projections* (2001) by Stanley Smith, Jeffrey Tayman, and David Swanson; and
2) *Community Analysis and Planning Techniques* (1990) by Richard Klosterman.

3.2.1. The Mathematical Extrapolation Techniques

The Mathematical Extrapolation Techniques involve the manipulation of data on a given population, without any comparison to other populations, in order to calculate a continuation of a trend. Extrapolation techniques require historical data series, measured at two or more intervals, which can be plotted or arranged to show a pattern or trend. This technique is based upon a simple, three-step process: 1) looking at past data, 2) fitting a curve to the data, and 3) projecting future populations based upon the best-fitting extrapolation curve. Six curves are typically employed by planners when undertaking the extrapolation technique: 1) Linear, 2) Parabolic, 3) Gompertz, 4) Geometric, 5) Modified Exponential, 6) Logistic.

Typically a linear transformation is used to make projections for each curve except the Parabolic Curve (see Klosterman (1990) for details on this). *Table 3.1* lays out the curve formulas and assumptions associated with each extrapolation curve. Each curve has something different to offer when projecting population; the sample growth patterns illustrate the type of growth that a particular curve might be appropriate for modeling (e.g. The linear curve models slow, steady growth well; while the geometric curve is a better model of rapid growth).

Table 3.1 Extrapolation Curve Formulas and Growth Pattern Assumptions

Curve	***Formula***	***Growth Pattern Assumptions***	***Growth Patterns***
Linear	$Y_c = a+bx$	Growth rate remains constant	
Geometric	$Y_c = ab^x$	Constant growth rate is compounded	
Parabolic	$Y_c = a+bx+cx^2$	Growth rate changes constantly either positively or negatively without a limit	
Modified Exponential	$Y_c = c+ab^x$	Growth rate increases or decreases constantly according to an upper or lower limit	
Gompertz	$Y_c = ca \exp (b^x)$	Growth rate increases or decreases constantly according to an upper or lower limit	
Logistic	$Y_c = (c+ab^x)^{-1}$	Growth rate increases or decreases constantly according to an upper or lower limit	
Source: Klosterman, 1990			

In order to decide on which extrapolation curve best fits a particular set of historic data, two methods are typically used: curve evaluation statistics and direct observation of the plotted projections in comparison to the observed data (also known as "eyeballing the data"). Evaluation statistics are quantitative techniques that are used to evaluate how well the curves fit the actual data. There are three evaluation statistics that are used to choose a best-fitting curve: 1) the Coefficient of Relative Variation (CRV), 2) the Mean Error (ME), and 3) the Mean Absolute Percentage Error (MAPE). In terms of evaluation, some of these statistics are given more weight than others – but all should be looked at carefully when choosing the best-fitting curve. Klosterman (1990) illustrates how to calculate these statistics and discusses the utility of these statistics in evaluating the results generated by a set of extrapolation curves.

Generally speaking, the techniques of extrapolation are best suited to measurement of population totals only. They are, however, very simple to apply, and require comparatively little data or technological complexity. These methods are referred to as direct, in that they obtain desired data (total population figures) from existing data of the same category.

Overall, extrapolation techniques are a suitable methodology for local planning agencies in many cases, so long as the limitations of the techniques are understood. The basic assumption is that past trends, as depicted by the historical series of data used, will not change in the future. Depending upon the growth potential and characteristics of a particular community, this is often not a valid assumption. For this reason, projections derived from extrapolation techniques should be employed only in tandem with a scenario building exercise that helps planning staff to understand the local, regional, and national trends that may be contributing to changes in population in the area.

3.2.2. Ratio Techniques

Ratio techniques express the population of a smaller area (the "target area") as a proportion of the larger area (the "pattern area") in which it is located. Also referred to as share techniques, they encompass a wide variety of methods and approaches. As opposed to extrapolation methods, the ratio techniques are a means of indirect measurement in that they rely on measurement of trends and data from a pattern area population for comparative purposes.

The primary assumption of the ratio techniques is that the growth of the smaller sub-area will imitate the growth of the larger geographic area due to similar factors affecting both regions. The primary benefit of the ratio techniques are that a target area's population projections are based upon accurate and available population projections for the larger areas. These techniques rely upon more stable and statistically accurate projection data from the pattern area population. Moreover, the projection data for the pattern area are published and updated frequently and planners with access to these data sources can easily apply ratio techniques to derive their appropriate share.

Along with extrapolation, ratio-based techniques comprise the vast majority of estimation methods used by local governments. Ratio techniques come in many different forms:

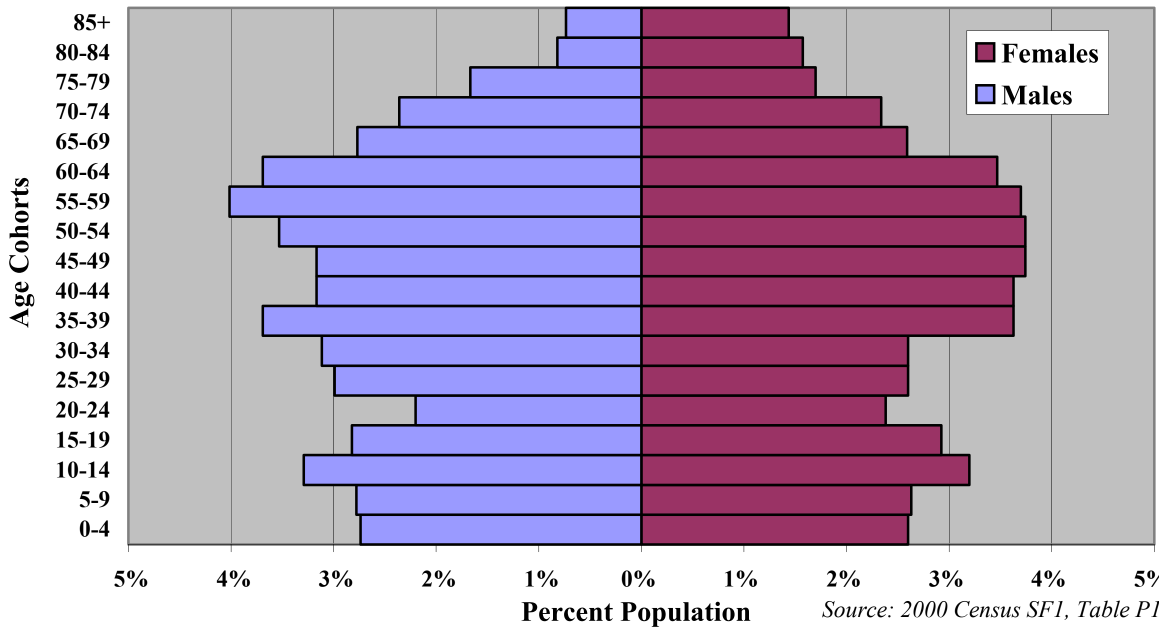
1) *Constant-share*: The constant-share method assumes the target area's current share (ratio) of the larger area's population is held constant at a particular historical level. For example, if Leon County was determined to have 3% of the state of Florida's population in 2000, then we can generate a projection for the Leon County 2030 population by multiplying this share (3%) by the state's 2030 projected population.
2) *Shift-share*: The shift-share method also assumes that the target area's past and current share (ratio) of the larger area's population is a foundation upon which to project a target area's population. However, the shift-share technique attempts to account for changes in population share over time by incorporating a "shift term" in the projection model. For example, if Hardee County grew at a 10% faster rate than the state during a given period, then this method assumes that the county will continue to grow at this accelerated rate over the forecasting horizon.
3) *Share-of-growth*: The share-of-growth method uses the target area's share of growth during a given time period as the primary factor in calculating and predicting future population levels. The target area's share of growth is defined as the proportion of the pattern area's growth that occurs within the target area during a period of time. For example, if Alachua County captured 2% of the state's net population growth during the period 2000-2005, then the share-of-growth method assumes that the county will continue to capture 2% of the state's net growth during the forecasting horizon.

3.2.3. Cohort Component Method

The cohort component method involves the separate calculation of births, deaths, and migration data (components) by age, sex, and racial groups (cohorts). The basic procedure of this method involves projecting populations – one cohort at a time – through the application of the appropriate fertility, mortality and migration rates. In order to make projections using this method, age-sex cohorts are traced over five year periods (0-4, 5-9, … 80-84, 85+). Usually different projections are made for whites and non-whites because they experience different rates of fertility, mortality, and migration. The effects of mortality and migration are considered to affect all cohorts while fertility affects only specific, at-risk groups.

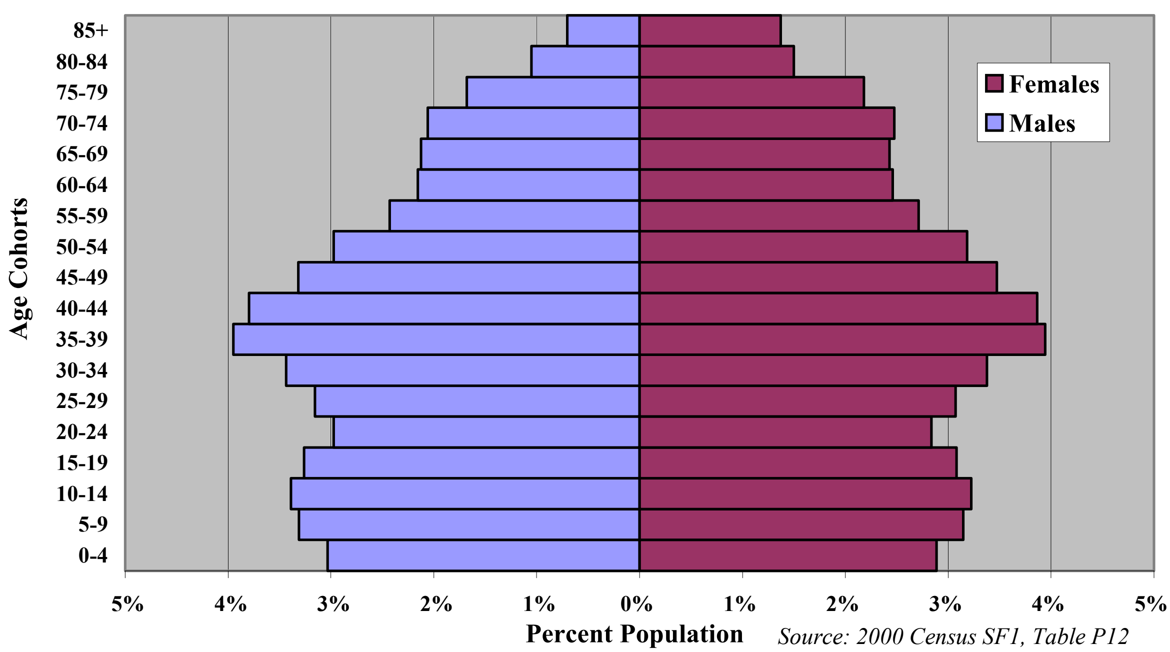
The major advantage of the cohort-component method is the analytical value of the derived data, which may be disaggregated to show detailed characteristics of the population. Underlying assumptions (such as specific fertility rates) can be varied to produce differing results. The availability of this detailed information to the local planner, who can use it for his own estimation and projection purposes, is an obvious advantage. In addition, this method allows for the production of "population pyramids", a graphic technique that summarizes the age-sex structure of a population. For example, Figures 3.1 and 3.2 show population pyramids for Franklin County and the State of Florida in 2000, respectively. These figures would help a planner in Franklin County to understand that their population is much older and "top-heavy" than that of the state. In addition, Figure 3.1 illustrates that Franklin County is losing a high percentage of its young adults (see the 15-19 and 20-24 cohorts).

Figure 3.1 Franklin County
Percent Population by Age and Sex, 2000



Source: 2000 Census SF1, Table P12

Figure 3.2 State of Florida
Percent Population by Age and Sex, 2000



Source: 2000 Census SF1, Table P12

Although the cohort component method produces more detailed, disaggregated outputs, this method is typically not appropriate for use by local governments. The cohort component approach is an extremely complex and sophisticated methodology, as it entails computation of natural increase and net migration data, while incorporating adjustments made for shifts in institutional and military populations during the period of analysis. In addition, the cohort component method has much more extensive data requirements than the extrapolation and ratio techniques. Lastly, birth, death, and migration rates can vary tremendously at the local level, sometimes yielding population projections that. For these reasons, the cohort component method is best employed to generate projections at the state and national levels, where data sources, technical capacity, and smoothed trends are in existence.

3.2.4. Economic-Demographic Models

Economic-demographic methodologies can be used for projecting future population levels and are based on economic factor analysis. Economic variables, such as unemployment rates, per capita income, labor supply, and production rates, are tied to birth, death, and migration components by means of complex computer programs. Thus, different assumptions can be used in the formula to project different set of outcomes, depending on estimates of future economic conditions. Like cohort-component methodologies, economic models are extremely complex and costly to employ, and therefore not normally appropriate for use at the local level.

3.3 An Overview of the Population Forecasting Process in Florida

With respect to official state estimates and projections, county governments have much more data available to them than do cities. For example, BEBR produces annual inter-censal estimates and population projections for each county, forecasting twenty-five to thirty years ahead. Counties may rely upon state-generated county data alone, if they choose to do so, and not be concerned with developing their own methodologies. Cities, on the other hand, are required to at least make population projections, since the only official state data available for their use is the annual estimate of total population. Recall, also, that these data are based on 2000 census counts and have become less and less reliable each year since then, barring any special census counts. While the 2010 census will once again update the database and provide a new benchmark, during these inter-censal periods cities must either be content with using state data sources or actively develop and maintain their own data. In the coming decade, the American Community Survey will provide some subcounty population and economic data to local governments, but these data will be of less accuracy for less populous counties due to the smaller sample size.

Once basic assumptions have been agreed upon, the process of developing population estimates and projections can begin with higher levels of confidence. Current estimates of population, as noted above, are computed annually for all Florida counties and cities by BEBR, and are the recommended first source of data that a local government consults when undertaking a population projection and forecasting exercise. If local governments compute their own estimates, they must use a professionally accepted methodology and document this process in their comprehensive plans and EAR updates, in accordance with Rule 9J-5 requirements. An accurate, well-founded estimate of current population characteristics will indicate the present status of the community and the needed thrust of the comprehensive plan elements. For example, if the population estimate demonstrates conclusively that recent growth has far exceeded earlier projections, then the government's capital improvements construction schedule, based on the earlier projections, would need to be immediately revised. Other planning goals and objectives would undoubtedly need revision, as well.

Population projections, which attempt to assess future growth levels, should then be developed. These figures will be essential in forecasting future demands for services and facilities, and, therefore, must be applied in a consistent manner in each of the plan's elements. Although perfect accuracy is a desirable goal, realistically we must be content with reasonably close approximations, which are based on our best analysis of current and emerging trends. Using the current estimate as the base population figure, county planners must choose between using official state-generated projections and developing their own. City planners do not have this option, but must select an appropriate methodology and make their own projections. The choice of methodology will be based on the level of complexity required of the projected data, the data-processing resources of the community, and the availability of skilled demographic analysts to perform the desired computations. Simple, relatively accurate, cost-effective methodologies and techniques, such as the extrapolation and ratio methods, are available to the local planners, so only rare cases would a local government need to employ a high level of sophistication in making population projections.

Generally speaking, the timeframes for population estimates and projections should reflect the adoption date of the comprehensive plan or the most recent update to the plan. In addition, Rule 9J-5 requires at minimum that local governments use planning timeframes of five years and ten years from adoption or most recent update of the local comprehensive plan. For land use planning and infrastructure planning purposes, however, a longer-term timeframe may be necessary.

SECTION 4.0 SCENARIO BUILDING AS A FORECASTING TOOL

4.1 What is Scenario Building?

There is increasing recognition that to be successful as forecasters, planners and other public officials must become authorities on the areas for which they are undertaking forecasts. Knowledge of the local culture, the local economic base, the existing and changing political climate, and a deep understanding of regional development and socio-demographic trends allow the analyst to more effectively test and refine their assumptions and to generate population projections with face validity and a greater likelihood of accuracy. One of the leading planning scholars on population forecasting, Isserman (1984, p. 214) writes that "being able to draw relationships between current events and the area's future is essential" to effective forecasting. There is no substitute for detailed local knowledge.

Working for the RAND Corporation in the early 1940s, noted futurist Herman Kahn, coined the term "scenario planning", from which modern day scenario building can trace its roots. Under "scenario planning", organizations attempt to engage the future by analyzing possible future events and considering alternative versions of future conditions, or scenarios. While scenario building is used in this report, this term is often used interchangeably with "scenario planning", "scenario-based planning", and "scenario analysis".

At its core, "scenario building" represents a systematic approach to gathering a broad range of data about a local area and analyzing these data to understand those trends that are currently shaping the community and to identify emerging trends that will shape the area in the foreseeable future. Scenario building is undertaken:

1. **To Provide a Detailed Information Base**: Generally speaking, scenario building centers upon an effort to learn as much about the local community as possible. Much like the comprehensive planning process, a detailed information base provides the basis from which a better prediction about the future can be made. All things being equal, better forecasts result when based upon more and more detailed information inputs about local conditions and trends.

2. **To Combat Uncertainty About the Future**: On a related front, scenario building helps to confront the most prominent obstacle to good forecasting; uncertainty. Simply put, the future is largely unknown to us. However, better forecasts can result from efforts to diminish the level of uncertainty surrounding existing conditions, near-term trends, and efforts to actively think about long-term changes to local, regional, national, and international conditions. Scenario building is designed to push planners and public officials to "engage the future" by asking them to think about future conditions in the local community.

In some ways, scenario building is like strategic planning. In a strategic planning exercise, also known as a SWOT analysis, individuals are asked to identify:

- Existing Strengths in the current conditions of the local community (or firm or agency)
- Existing Weaknesses in the current conditions of the local community (or firm or agency)
- Potential Opportunities to improve the local community (or firm or agency)
- Potential Threats to the long-term viability of the local community (or firm or agency)

SWOT analyses are designed to get communities (or organizations) to identify and think about local, existing strengths and weaknesses, as well as potential, external opportunities for development and threats to long-term health.

Scenario building is similarly designed as an exercise to engage planners in thinking about the future along both the local – non-local dimension and the positive – negative dimension. However, unlike strategic planning, a scenario building process is not necessarily designed to influence policy, but rather to identify likely future population levels given the current state of knowledge about a community.

4.2 Why Scenario Build?

4.2.1 Building Upon the Comprehensive Planning Process

Scenario building represents a potentially very useful planning tool because this effort can easily build upon existing data sets and existing community connections. Under Florida's growth management laws, local governments are directed to capture a broad array of data on local conditions and report these in their comprehensive plans, in the evaluation and appraisal report

(EAR) process, as part of the plan amendment process, and when undertaking any special planning efforts, such as sector plans or corridor studies. These laws also require that the planning process be inclusive of input from affected parties, including citizens, business leaders, interest groups, and non-profits. As such, local planners have available to them a very detailed dataset and a set of connections with a broad spectrum of interests, both of which represent primary inputs into the scenario building process. In some ways, scenario building is simply an extension of the comprehensive planning process to the development of a population forecast (Avin, 2007).

4.2.2 Indirect Benefits of Scenario Building

A second reason that scenario building represents a vital activity for local planning staff rests in the indirect benefits associated with this planning effort. Harwood (2007) notes that scenario building can build local planning capacity by:

1. Providing opportunities for residents and other affected parties to engage in a planning process that involves more than just disputes about local land uses, and
2. Stimulating discussion about community values and getting parties to “engage the future”.

These and other indirect benefits make scenario building a valuable exercise for local governments.

4.2.3 Inadequacy of BEBR’s County-Level Projections

Lastly, scenario building is useful as it offers the potential to improve upon our forecasts. As detailed earlier in this report, each year the Bureau of Economic and Business Research (BEBR) produces a set of population projections for the state of Florida and its counties, figures which represent the state’s official population forecast. These projections are prepared by an exceptionally well-trained and nationally recognized set of experts in demography and population analysis. However, despite the credentials of the BEBR staff and the technically sound work produced by the Bureau, it is important that local governments understand that historically BEBR’s population projections have been off by a substantial percentage. These errors are due in part to unforeseen changes in local and regional economies, the impacts of natural disasters (such as hurricanes) on cities and counties, and changes in real estate housing patterns, consumer preferences, and land development.

Table 4.1 presents information on the level of error in BEBR's population projections 1975-2000. This table presents the percentage error for the year 2000 medium series population projection for the state and each county, at five different points in time; 1975, 1980, 1985, 1990, 1995. For example, BEBR's projected population for the state produced in 1975 was -8.91% less than the actual population in the year 2000.

These data are not intended to suggest the that population projections generated by BEBR are of little use to local governments, nor are these data intended to suggest that BEBR's work is of poor quality. Quite to the contrary, this information is intended to illustrate that projections produced by the state's leading experts are prone to significant error. This information should provide a note of caution to planners and public officials as they utilize BEBR's population figures in their planning efforts and within their comprehensive plans.

Table 4.1 reveals that BEBR's population projections became more accurate as the projection horizon decreased. Projections generated in 1990 and 1995 (with projection horizons of 10 years and 5 years, respectively) were generally more accurate than the projections generated in 1975 and 1980 (with projection horizons of 25 years and 20 years). This reflects one of the basic tenets of population forecasting, forecast accuracy increases as the projection horizon diminishes.

Beyond illustrating that its much easier to project population levels five years from a launch year than twenty-five years from a launch year, Table 4.1 provides evidence of the fallibility of BEBR's population projections. This table illustrates that on average BEBR's twenty year population projections, with 1980 as the base year, were low by over 15%. For specific counties the level of error was much greater, as projections for both Flagler County and Osceola County under projected their year 2000 populations by over 50%. For a county by county overview of the historical accuracy of BEBR's projections, see Appendix B.

Table 4.1 Projection Errors for BEBR Year 2000 Medium Series Projections

AREA	1975	1980	1985	1990	1995
Florida	-8.91%	-14.76%	-8.21%	0.04%	-2.85%
Alachua	3.23%	-12.96%	5.11%	3.05%	-3.24%
Baker	9.17%	-11.50%	0.63%	6.92%	-1.61%
Bay	2.35%	-8.92%	5.32%	16.86%	1.61%
Bradford	-21.04%	-14.52%	7.71%	8.48%	-1.87%
Brevard	-16.89%	-21.42%	3.25%	12.05%	5.18%
Broward	4.46%	-6.43%	-12.55%	-7.81%	-9.36%
Calhoun	-27.02%	-12.42%	-26.25%	1.41%	-3.97%
Charlotte	-12.23%	-27.91%	-4.26%	0.62%	7.39%
Citrus	-10.32%	-32.68%	4.92%	11.53%	3.15%
Clay	-27.85%	-31.26%	-8.32%	1.20%	-1.71%
Collier	-35.20%	-37.66%	-22.03%	-17.89%	-10.89%
Columbia	-22.14%	-22.85%	-11.17%	-7.45%	-3.21%
Desoto	13.94%	-8.41%	-15.55%	-8.72%	-5.00%
Dixie	-13.94%	-15.38%	0.53%	-2.36%	1.25%
Duval	1.50%	-16.19%	-16.07%	3.43%	-1.63%
Escambia	2.88%	-2.25%	6.55%	13.48%	1.93%
Flagler	-56.45%	-65.08%	-39.80%	-23.34%	-6.29%
Franklin	-0.30%	8.86%	-7.42%	-4.36%	10.90%
Gadsden	2.91%	-8.18%	13.11%	10.45%	6.02%
Gilchrist	-18.96%	-30.04%	-19.65%	-36.27%	-3.72%
Glades	4.01%	-12.07%	-25.30%	-10.17%	-2.61%
Gulf	-11.40%	-7.97%	-21.70%	-0.41%	5.08%
Hamilton	-24.96%	-19.71%	-28.72%	-15.96%	6.55%
Hardee	49.23%	-11.28%	-15.73%	-4.22%	-12.39%
Hendry	-6.38%	-20.74%	-12.18%	-8.86%	-9.42%
Hernando	-39.91%	-39.91%	-0.77%	6.27%	9.63%
Highlands	-6.83%	-6.71%	-4.08%	4.27%	0.04%
Hillsborough	-9.42%	-9.90%	-6.52%	3.51%	-3.53%
Holmes	-22.43%	8.27%	-7.89%	12.04%	-3.04%
Indian River	-11.46%	-18.37%	14.21%	9.25%	-1.19%
Jackson	1.81%	0.31%	-11.45%	9.29%	3.09%
Jefferson	-17.84%	-3.12%	6.96%	11.61%	8.51%
Lafayette	-34.49%	-1.74%	-13.13%	-8.86%	-1.74%
Lake	-31.93%	-32.69%	-18.73%	-9.18%	-5.00%
Lee	-16.74%	-21.18%	-3.40%	2.25%	-2.79%
Leon	7.91%	-17.85%	-5.70%	-0.94%	-1.65%

Table 4.1 Projection Errors for BEBR Year 2000 Medium Series Projections (continued)

AREA	1975	1980	1985	1990	1995
Levy	-26.27%	-23.66%	-14.37%	-9.43%	-3.63%
Liberty	-24.51%	-15.97%	-30.21%	-24.51%	3.97%
Madison	-12.45%	-8.72%	-12.45%	-3.91%	0.36%
Manatee	-13.83%	-17.65%	-15.72%	-9.55%	-1.97%
Marion	-26.23%	-33.61%	-3.87%	1.89%	-0.82%
Martin	26.57%	-18.88%	1.55%	2.42%	1.16%
Miami-Dade	-5.92%	-7.04%	-17.61%	-5.52%	-5.00%
Monroe	-22.35%	-13.68%	0.64%	17.86%	12.08%
Nassau	14.80%	-14.50%	-11.38%	10.12%	-8.43%
Okaloosa	-1.29%	-9.27%	9.44%	18.42%	3.93%
Okeechobee	2.48%	-6.99%	-1.70%	10.28%	6.38%
Orange	-21.80%	-33.43%	-21.44%	-5.88%	-6.01%
Osceola	-55.19%	-57.62%	-14.49%	-15.65%	-3.24%
Palm Beach	-23.69%	-16.40%	-4.99%	3.69%	-5.02%
Pasco	-0.34%	-11.01%	5.17%	5.46%	-1.88%
Pinellas	12.11%	14.49%	2.61%	6.72%	-0.73%
Polk	-2.61%	-13.97%	-4.96%	4.19%	-0.15%
Putnam	-10.26%	-14.23%	-1.45%	7.21%	7.78%
Santa Rosa	-36.98%	-40.96%	-35.11%	-33.24%	-9.29%
Sarasota	4.00%	-3.51%	6.15%	1.06%	1.24%
Seminole	-13.88%	-20.56%	-4.35%	7.48%	2.11%
St. Johns	-39.70%	-41.14%	-4.88%	1.15%	-4.88%
St. Lucie	-22.26%	-28.90%	3.01%	3.53%	2.91%
Sumter	-28.02%	-32.51%	-33.83%	-25.58%	-18.46%
Suwannee	-35.14%	-15.34%	-5.58%	-4.43%	-7.30%
Taylor	-13.27%	-1.33%	12.69%	19.96%	-1.85%
Union	16.05%	1.92%	-9.24%	-11.47%	2.66%
Volusia	-9.55%	-18.44%	-3.64%	5.79%	1.68%
Wakulla	1.04%	-36.14%	-18.21%	-20.83%	-11.21%
Walton	-44.58%	-36.21%	-14.53%	-8.62%	-10.10%
Washington	11.10%	6.33%	-23.23%	-9.88%	-1.30%
Median	-12.23%	-15.34%	-6.52%	1.20%	-1.65%
Average	-11.86%	-17.33%	-8.30%	-1.20%	-1.20%
St Deviation	18.84%	14.73%	12.15%	11.97%	5.83%
Minimum	-56.45%	-65.08%	-39.80%	-36.27%	-18.46%
Maximum	49.23%	14.49%	14.21%	19.96%	12.08%

Table 4.2 underscores the finding that there is a significant level of inaccuracy in BEBR's population projections. This table reports the number of counties within a certain range of projection accuracy for the five time periods of interest; 1975, 1980, 1985, 1990, and 1995. For example, in 1990, BEBR's population projections for the year 2000 were within 5% of the actual figure in twenty-two of the state's sixty-seven counties, and between 5% and 10% for another twenty-two counties. This table also underscores the finding that forecast accuracy increases with shorter projection horizons.

Table 4.2 Number of Counties by Level of Absolute Projection Error

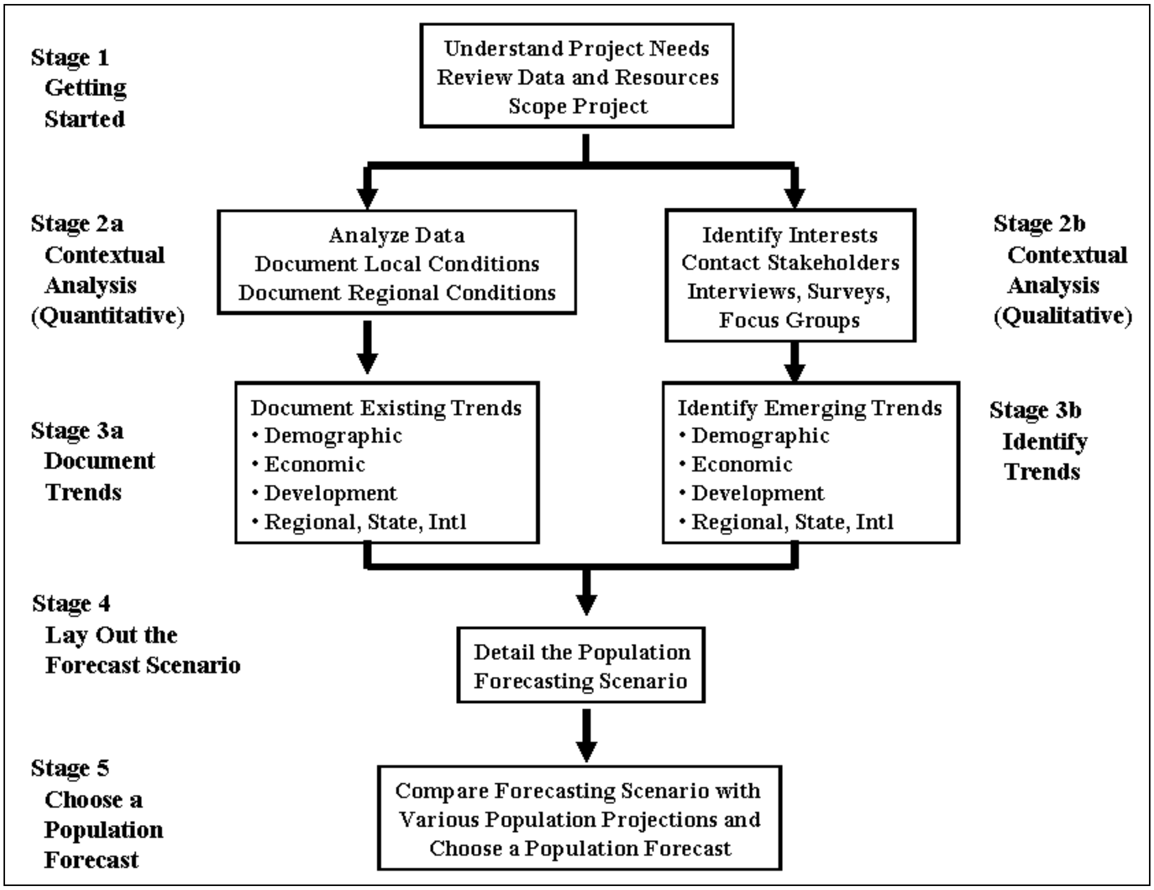
# of Counties	1975	1980	1985	1990	1995
>35%	9	8	2	1	0
20%-35%	17	15	9	5	0
10%-20%	19	23	21	17	7
5%-10%	7	14	15	22	18
0-5%	15	7	20	22	42

Probably of greatest interest to local government planners are the results for the twenty year projection horizon (the year 1980 medium projection series), as twenty years is the typical planning horizon for the comprehensive planning process. BEBR's medium series county population projections from 1980 were within 10% for only twenty-one of the state's counties. For the remaining forty-six counties, half were off by between 10% and 20% and the other half missed the mark by over 20%.

4.3 The Scenario Building Process

While scenario building has gained a foothold in local planning departments throughout the country, a common and established step-by-step set of guidelines for undertaking this process does not yet exist. However a review of the experiences of communities spread throughout the nation (see Hopkins and Zapata, 2007) and the work of Avin (2007) is suggestive of a generalized process. Figure 4.1 presents this generalized process.

Figure 4.1 Summary of the Major Steps in a Scenario Building Process



Note: Adapted from Avin (2007)

4.3.1 Stage One: Establishing Procedures

The first stage in the scenario building process centers upon developing a plan of action. Appropriate attention and energy at this stage is essential, as decisions made at this point in the process will affect future efforts. While there may be some push toward getting started in gathering data and issuing findings, at this stage planning staff should focus upon identifying useful and appropriate data sources, obtaining necessary documents and materials, and establishing a workplan for the process. It is also imperative that there be general agreement about the scope of the project and the actual outputs from this process.

4.3.2 Stage Two: Establishing the Context

Stage two centers upon efforts to understand the current community context, with attention paid to reviewing current demographic, economic, political, social, and cultural conditions in the community. Table 4.3 presents Bendavid-Val's (1991) "HINCO" framework for identifying the data needed to support this type of analysis. He suggests that local planning staff needs to have a broad understanding of local conditions in five main areas:

- *Human aspects*: Attributes of the community's people
- *Institutional aspects*: Identification of major institutional actors in the community
- *Natural aspects*: Environmental opportunities and constraints
- *Capital aspects*: Conditions of the local capital facilities, urban service, and budget
- *Other aspects*: Conditions in areas outside of the community's boundaries

Some of these data should already be available to planning staff, as it is captured as part of the comprehensive planning process. Other data can be acquired from other public sector agencies.

Table 4.3 Summary of Types of Data to Be Acquired in the Scenario Building Process.

Analytical Rubric	Typical Subjects Explored
Human Aspects	Population (Size, race, age, etc.), Education, Health, Housing, Employment (by type, #, income), etc.
Institutional Aspects	Governments, Universities, Chambers of Commerce, Medical complexes, etc.
Natural Aspects	Water resources, Forestland/Farmland, Topography, Scenery, Historic sites, etc.
Capital Aspects	Infrastructure, Public resources, Private resources, Land holdings, Land use potential
Other Aspects	Regional setting, Regional linkages, Planning milieu, Trade areas, Local culture

Source: Bendavid-Val (1991)

Paralleling the work of planning staff to capture, analyze, and report on the existing conditions, should be an effort to reach out to local institutions, non-profits, and community groups to solicit their views on trends that will affect the local community in the coming years. Unlike the

HINCO-based work, much of this work will be of a qualitative nature, involving interviews and focus groups. The goal of this effort is to help planning staff think more broadly about existing conditions and the trends (both existing and emerging) that will affect the local community.

4.3.3 Stage Three: Documenting Trends

The third stage in the process centers upon a distillation and interpretation of the wealth of data and information gathered as part of the work in Stage Two. Certain trends will be evident from the data collected, such as population growth, changes in the local economic make-up, rising numbers of housing starts, etc. However, other trends will emerge only from a broader, more holistic review of the information obtained via interviews and discussions with actors knowledgeable about regional or national trends, such as regional/state planning staff, chamber of commerce representatives, environmental groups, and industry representatives. These trends should be documented and utilized as a primary input into the forecast scenario.

4.3.4 Stage Four: Putting the Forecast Together

Stage four centers upon the development and enumeration of the forecast scenario. It is during this stage in the process that tools such as brainstorming and "futurecasting" prove to be very useful. Each of these techniques encourages planning staff to engage the future and think through the implications of the combination of existing conditions with existing/emerging trends.

Ultimately, this process will yield a "forecast scenario", or the set of assumptions about future conditions, specified for the area being studied and for the projection method(s) utilized, across the projection interval (Isserman, 1984). The forecast scenario shapes planning staff's understanding of the range of projections generated from the application of the methods discussed in Section 2.0. For all practical purposes, then, the scenario is the population forecast. Appendix C presents an example forecast scenario for Franklin County, Florida.

4.3.5 Stage Five: Selection of a Population Forecast

The final stage in the process involves using the forecast scenario as the primary input in the selection of a reasonable, plausible population forecast for the community. More specifically, in this final stage, different population projection series are measured against the forecast scenario.

The most obvious value of the forecast scenario is that any implausible projections can be quickly discarded and analysts can focus upon a much smaller set of reasonable projections. In addition, the forecast scenario sharpens the focus of the analysts upon the most reasonable of the projection series and aids in the selection of the final population forecast.

SECTION 5.0 TOWARDS BETTER FORECASTING PRACTICES

The success of Florida's local comprehensive planning process is based in part upon the accuracy of the population estimates and projections that lie at the heart of these plans. These planning documents attempt to capture the expected impact of population growth on the demand for housing, transportation facilities, recreation facilities, schools, and other capital facilities. To be successful, then, these plans require timely and accurate population forecasts.

This report is intended to support the efforts of local governments as they undertake their own demographic analyses and produce in-house population forecasts. Based upon a diverse scholarly and practitioner-oriented literature (with key references summarized in Appendix A), this section pulls together the key conclusions from this literature and presents a set of local government "Do's" and "Don'ts" as they pursue the development of their own population forecasts.

5.1 Do Start with BEBR's Population Projections

The Bureau of Economic and Business Research (BEBR) produces an excellent set of state-level and county-level population projections on an annual basis. These figures are generated by a team of well-trained and highly-skilled professionals employing an appropriate set of population projection methodologies. Generally speaking, BEBR provides quality projections at a very low cost to local governments.

> *Rule #1: BEBR's population projections should be the starting point for local government planning staff as they undertake any sort of demographic analysis.*

5.2 Do Not Stop at BEBR's Population Projections

When planning for future population levels, the most common mistake that local governments make is to assume a very high degree of accuracy in BEBR's population projections. Many local governments utilize BEBR's official medium series population projections, which is specifically allowed by Chapter 9-J5. As Tables 4.1 and 4.2 make clear, however, the assumption that BEBR's medium series projections are highly accurate can be incorrect, especially as the time horizon for these forecasts increases. Too often local governments utilize BEBR's figures with little to no consideration of the potential accuracy of these figures and no "ground truthing" to determine whether these figures make sense given local development trends, local economic changes, and local efforts to promote or slow growth.

> *Rule #2: Local government planning staff must recognize the limitations of BEBR's population projections and, at minimum, assess the likely accuracy of these figures given their knowledge of local conditions and trends.*

5.3 Do Rely Upon a Range of Data Inputs

As summarized in Section 2.0, there is a wealth of demographic and economic data available to local planning staff if they undertake the effort to project future population levels. While many planners are aware of and make use of data provided by the decennial census, they are often unaware of the wealth of other socio-demographic and economic data that is available to them. In the coming years the American Community Survey will provide increasingly useful and more timely data to local governments. In addition to their demographic data, the Census Bureau collects and makes available a wide range of data on economic activity, including data on employment trends and building activity. Planners should also recognize that other enterprises within their local government likely collect data that are extremely valuable in assessing changes in population and development activity. These symptomatic indicators of population change can be obtained from the local school board, local utilities, the public works department, the elections office, and within the planning department itself.

> *Rule #3: Local government planning staff should obtain and make use of a broad range of demographic data and development-related data to aid them in tracking local population changes and to identify emerging development trends.*

5.4 Do Build Capacity with Basic Forecasting Methodologies

Underlying most population forecasts are a few basic methodologies (summarized in Section 3.0), most of which can be learned and employed by planning practitioners. For example, BEBR's projections rely upon a combination of extrapolation curves, ratio techniques, and cohort-component methodologies. Given the power of computers, the utility of spreadsheet software, and the availability of demographic data, these methodologies can be employed at low cost by even the smallest local planning departments. In addition, detailed overviews of these methodologies are available (see Klosterman, 1990 and Smith et al, 2003) and training is sometimes available through planning organizations such as the American Planning Association.

Rule #4: To appropriately and accurately utilize the range of population forecasting methodologies, local government planning agencies should invest in the technical capacity of their staff.

5.5 Don't Undertake Forecasting Work Behind Closed Doors

While many planners have a detailed knowledge of local conditions and an excellent grasp of local political realities, no one individual has a complete understanding of the full range of factors that may be influencing the local economy and shaping an area's future. It is therefore imperative that any forecasting work seek and incorporate input from a range of local experts. At minimum, planning staff should seek input from major local institutions (e.g. large employers, universities, and medical complexes), representatives from the development and real estate industry, and leaders of influential community groups.

Rule #5: When undertaking population forecasting work, local government planning staff should seek input from a broad range of local experts.

5.6 Do Use Tools Like Scenario Building to Engage the Future

As detailed in Section 4.0, one useful tool available to planning staff as they develop their own population forecasts is scenario building. This tool offers planning staff a structured, detailed way of engaging the future by taking stock of current conditions, assessing any changes in these conditions, and recognizing emerging demographic, development, and economic trends. Scenario building requires planning staff, and other involved in the process, to think about the future in a much more meaningful way than is typically undertaken by local governments.

Rule #6: Local government planning staff should regularly (every few years at the least) allocate resources to a scenario building exercise.

5.7 Engaging the Future: The Time is Now

In conclusion, Florida's growth management and comprehensive planning process rests in part upon the ability of local governments to gaze into the future and make reasonable forecasts about future population levels within the community. This can be done most successfully when appropriate and technically sound methodologies are combined with a detailed understanding of the context within which projections are being prepared. Given the wide availability of high-quality demographic data, powerful computers, spreadsheet software, and training on basic forecasting methods, local governments can no longer claim that they do not have the tools or cannot afford the costs of undertaking demographic analyses and population forecasting. Additionally, given their role in reviewing development projects, their role as a clearinghouse for information, and their connections to many community interests, planning staff are ideally placed to understand the local context and interpret changes in local conditions.

At its core planning, and by extension the comprehensive planning process, is intended to be the place within the public sector in which the future is engaged and actively considered. Comprehensive plans, and the population projections contained within these plans, represent the ideal place for a community to actively and more effectively engage the future. All the tools necessary to do so are now readily and cheaply available to local governments. The only remaining obstacle to more accurately forecasting future population levels and more effectively engaging the future is the lack of will to do so.

APPENDIX A ANNOTATED BIBLIOGRAPHY

This Appendix is intended to direct planners and public officials to useful sources of information on population data, forecasting methods, and the accuracy of these methods. Starred items (*) are particularly useful and recommended as a first source of information.

1.0 General Readings on Population Forecasting

Bendavid-Val, Avrom (1991). *Regional and Local Economic Analysis for Practitioners, Fourth Edition.* New York: Praeger Press.

> This book provides a broad overview of methods for understanding and analyzing a local economy.

*Hobbs, Frank, and Nicole Stoops (2002). Demographic Trends in the 20th Century: Census 2000 Special Reports. *U.S. Census Bureau*, Retrieved July 3, 2007, from http://www.census.gov/prod/2002pubs/censr-4.pdf.

> The authors present an analysis of demographic trends in the United States in along many variables, including population size and composition by age, sex, and race. They also detail trends in housing, household composition and household size.

*Isserman, Andrew M. (1984). Projection, Forecast, and Plan: On the Future of Population Forecasting. *Journal of the American Planning Association*, 50: 208-221.

> The article presents arguments in favor of changing the way population forecasts are made and used in the planning process. The author argues that current trends analyses are insufficient to obtain reliable population forecasts, thus it is necessary to introduce scenario-building and other new analytic methods that are not usually considered in formal models.

Isserman, Andrew M. (1993). The Right People, The Right Rates. *Journal of the American Planning Association*, 59(4): 45-64.

> The article introduces and describes improvements to the cohort component method, including refinements to birth and survival rates and an overview of an interregional migration method that improves upon the net migration method.

*Klosterman, Richard E. (1990). Community Analysis and Planning Techniques. Lanham, MD: Rowman & Littlefield Publishers, Inc.

> The author introduces and describes the major analysis techniques that are important for planners and demographers. The extrapolation technique, the cohort

component method and constant/shift share techniques are included with examples, limitations, assumptions and application.

Lavin, Michael R. (1996). Understanding the census: A guide for marketers, planners, grant writers and other data users. Kenmore, NY: Epoch Books.

The book provides an overview of the U.S. Census with easy-to-follow explanations to provide planners with more tools to generate efficient analysis of the information they have available.

*MacDonald, Heather (2006).The American Community Survey: Warmer (more current), but Fuzzier (less precise) than the Decennial Census. *Journal of the American Planning Association*, 72(4): 491-503.

The American Community Survey has been introduced by the U.S. Census Bureau as a replacement for the Census long-form. The author evaluates the advantages and disadvantages of this new tool for planners like having more current data but with smaller sample sizes.

*Myers et al (2001). Symposium: Putting the Future in Planning. *Journal of the American Planning Association*, 67(4): 365-401.

Four different authors discuss how planners might more successfully link current planning efforts to the. First, a review of contributions made to the planning field. Second, similarities and differences between forecasting and envisioning are discussed. Third, new demographic alternative interpretations for demographic trends are shown. Finally, a summary is included to provide a perspective for the future to planners.

*Smith, Stanley K. 1997. Further Thoughts on Simplicity and Complexity in Population Projection Models. *International Journal of Forecasting*, 13: 557-565.

As a response to an issue of *Mathematical Population Studies* that investigates the value of simpler vs. more complex population projection methods, the author discusses the value of simplicity versus complexity, analyses evidence regarding population forecast accuracy, describes the costs and benefits related to disaggregate population forecasts, discusses the potential benefits of combining forecasts, provides information on criteria for evaluating projection models, and details issues of economic efficiency in the production of population projections.

*Smith, Stanley K. and Stefan Rayer (2007). Methodology for Constructing Projections of Total Population for Florida and Its Counties, 2006–2030. *Bureau of Economic and Business Research,* University of Florida.

This document summarizes the state and county total population projection methodologies utilized by the Bureau of Economic and Business Research.

*Smith, Stanley K. and Stefan Rayer (2007). Methodology for Producing Population Projections by Age, Sex, Race, and Hispanic Origin for Florida and Its Counties, 2006–2030. *Bureau of Economic and Business Research,* University of Florida.

The authors present a description of the methodology they used to generate 2030 population projections estimates for Florida by age, sex, race and ethnicity.

*Smith, Stanley K., Jeffrey Tayman and David A. Swanson (2001). *State and Local Population Projections: Methodology and Analysis.* New York, NY: Kluwer Academic/Plenum Publishers.

This is by far the best available book that provides a detailed overview of the methodology and analysis of state and local population projections. The book provides an overview of the most commonly used data sources and estimation techniques while also covering other issues relating to these concepts (scenario building, assumptions, evaluation criteria, etc.)

U.S. Census Bureau, U.S. Department of Commerce: Economic and Statistics Administration (September 2002). Census 2000 Basics. Retrieved July 3, 2007, from http://www.census.gov/mso/www/c2000basics/00Basics.pdf

The document provides a general overview of Census basics, including a summary of the questionnaire, results, and analysis. Also, definitions for each geographic area are provided along with a summary of the different approaches to utilizing the 2000 Census data.

Yen, Maria, and Grace York (2003).Information from Secondary Sources. In Hemalata C. Dandekar's (Ed.) *The Planner's Use of Information*. Chicago, IL: Planners Press: American Planning Association.

This chapter describes the sources of relevant information for planners that has already been collected by local and state governments and by other agencies.

2.0 Publications on Scenario Building

*Avin, Uri. (2007). Using Scenarios to Make Urban Plans. In. Lewis D. Hopkins and Marisa A. Zapata's (Eds.) *Engaging the Future: Forecasts, Scenarios, Plans, and Projects.* Boston, MA: Lincoln Institute.

This chapter presents an approach to scenario building, with specific attention paid to this process in a public planning setting.

Coates, Joseph F. (2000). From My Perspective: Scenario Planning. *Technological Forecasting and Social Change*, 65: 115-123.

The author discusses the evolution of scenarios, their rise in popularity, and wrestles with the question of what scenarios actually are.

*Harwood, Stacy A. (2007). Using Scenarios to Build Planning Capacity. In. Lewis D. Hopkins and Marisa A. Zapata's (Eds.) *Engaging the Future: Forecasts, Scenarios, Plans, and Projects.* Boston, MA: Lincoln Institute.

This chapter describes the indirect benefits of the scenario building process when undertaken by local and regional governments.

*Hopkins, Lewis D. and Marisa A. Zapata (Ed.). (2007). *Engaging the Future: Forecasts, Scenarios, Plans, and Projects*. Cambridge, MA: Lincoln Institute of Land Policy.

This book focuses upon issues relating to the forecasting of population and the development of scenarios as part of this process. The book is a compilation of chapters that provide a detailed overview of scenario building and why planning and forecasting are important for a community and its future.

Provo, Joanne, Wendy E. A. Ruona, Susan A. Lynham, and Roger F. Miller (1998). Scenario Building: An Integral Methodology for Learning, Decision-making, and Human Resource Development. *Human Resource Development International*, 1(3): 327-340.

The history of scenario building and processes for creating scenarios are presented in the paper, along with a discussion of different areas within organizations that might benefit from using scenario building as a tool for understanding the future.

Smith, Eric. (2007). Using a Scenario Approach: From Business to Regional Futures. In. Lewis D. Hopkins and Marisa A. Zapata's (Eds.) *Engaging the Future: Forecasts, Scenarios, Plans, and Projects.* Boston, MA: Lincoln Institute.

This chapter details the history and uses of scenario building as applied by industry leaders, private businesses, and the public sector.

3.0 Publications on Seasonal Population Methodologies

Happel, Stephen K. and Timothy D. Hogan. (2002). Counting Snowbirds: The Importance of and the Problems with Estimating Seasonal Populations. *Population Research and Policy Review* 21: 227-240.

This paper describes why and how to count Arizona "snowbirds", residents that spend the winter season in the state because of the weather. It focuses in defining the seasonal population under study and developing effective ways to gather information on this type of population.

Hogan, Timothy D. and Donald N. Steinnes. (1996). Arizona Sunbirds and Minnesota Snowbirds: Two Species of the Elderly Seasonal Migrant Genus. *Journal of Economic and Social Measurement* 22: 129-139.

The article focuses on "sunbirds" and "snowbirds" from Arizona and Minnesota, describing issues relating to age difference and permanent migration as a precursor of seasonal migration.

*Smith, Stanley K. (1987). How to Tally Temporary Populations. *American Demographics*, 9 (7): 44-45.

Defining and measuring temporary populations can be difficult and expensive, but can benefit businesses and state and local planning agencies. This paper details various ways of accounting for temporary populations, including direct estimates through censuses and sample surveys or indirectly through contacts such as realtors, chambers of commerce, sales tax collections, electric and water company customer lists, and tourist facility occupancy rates.

*Smith, Stanley K. (1989). Toward a Methodology for Estimating Temporary Residents. *Journal of the American Statistical Association,* 84: 430-436.

This paper analyzes the problems of defining and estimating temporary residents and provides direction to planners and other public officials tasked with identifying and enumerating temporary or seasonal residents.

Smith, Stanley K. and Mark House (2007). Temporary Migration: A Case Study of Florida, *Population Research and Policy Review*, 26(4): 437-454.

The authors analyze temporary migration streams in Florida, focusing on moves that include an extended stay. Using several types of survey data, they examine the characteristics of non-Floridians who spend part of the year in Florida and Floridians who spend part of the year elsewhere.

4.0 Publications Relating to Forecast Accuracy

*Murdock *et al* (1991). Evaluating Small-Area Population Projections. *Journal of the American Planning Association*, 57(4): 432-443.

Methods for evaluating small-area population projections have received little attention but are critical to their development and use. In this paper the author develops a model, illustrates measures and methods for evaluating small-area projections, and presents examples of the evaluation process.

Smith, Stanley K. (1987). Tests of Forecast Accuracy and Bias for County Population Projections. *Journal of the American Statistical Association*, 82: 991-1003.

Two different sets of projections are created using three projection techniques and data from 1950-1980 and then compared to actual U.S. Census counts to verify the accuracy of the forecasts.

Smith, Stanley K. and Jeff Tayman (2003). An Evaluation of Population Projections by Age. *Bureau of Economic and Business Research,* University of Florida.

The precision and bias of a variety of age-group projections at the national and state levels in the United States and for counties in Florida is investigated by the authors. Of most interest is the finding that no matter how simple or complex the methodology, there is little impact on the accuracy and bias of the age-group projections.

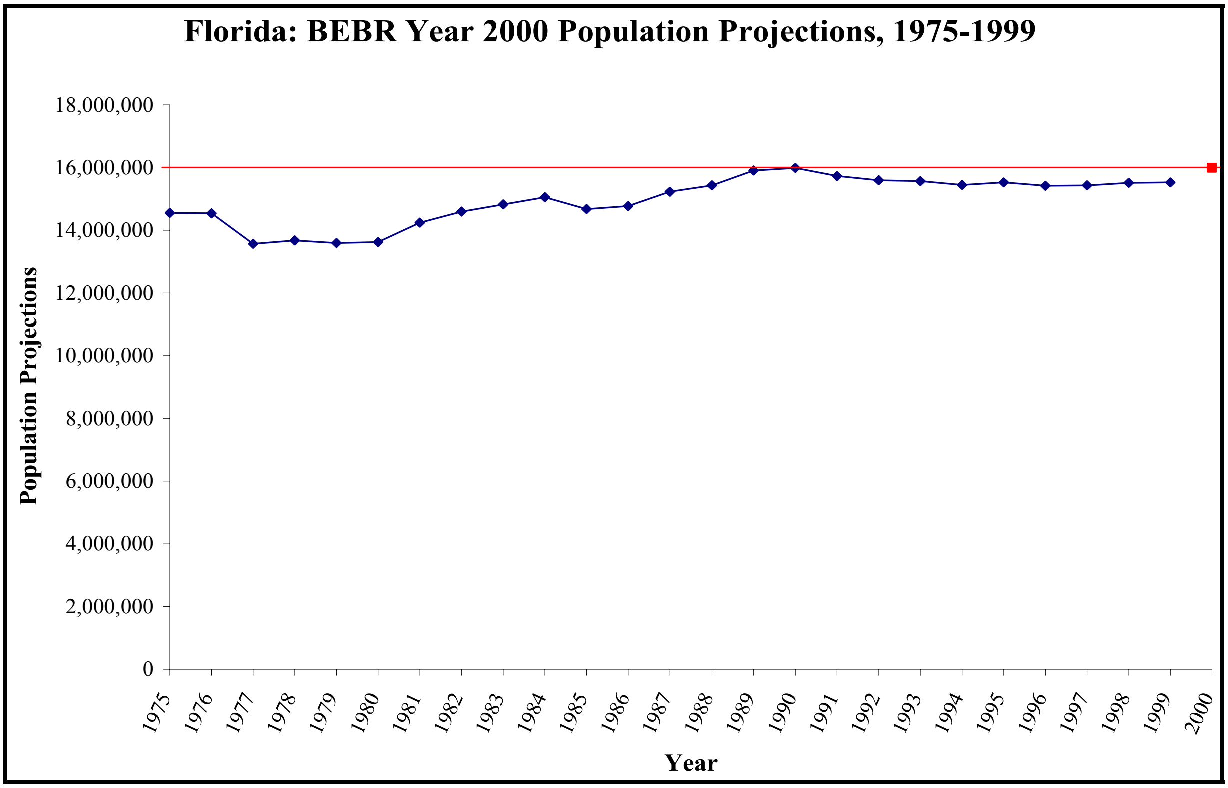
Smith, Stanley K and Scott Cody (2004). An Evaluation of Population Estimates in Florida: April 1, 2000. *Population Research and Policy Review*, 23: 1-24.

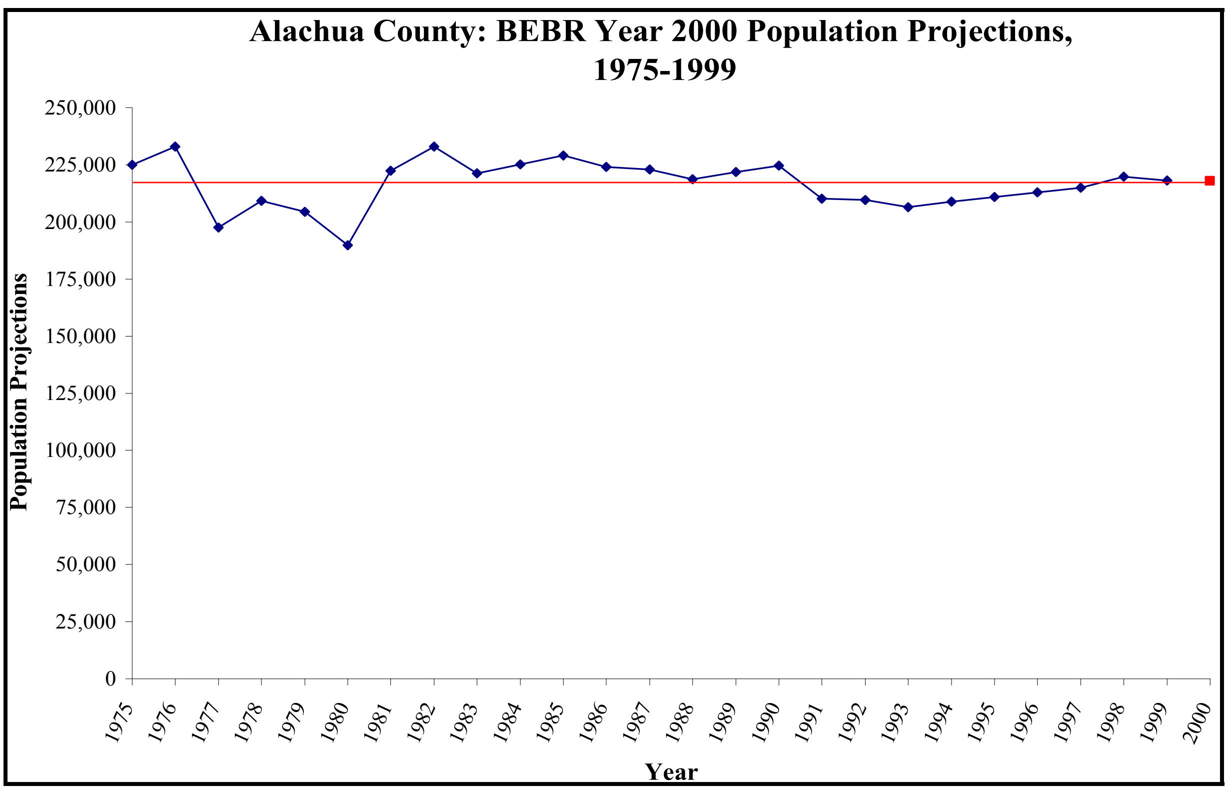
An evaluation of population estimates for counties and subcounties in Florida was performed by the authors, estimates that rely upon the housing unit method. This method is commonly used in small-area population estimates, thus an analysis of their accuracy is useful for planning and demographic analyses.

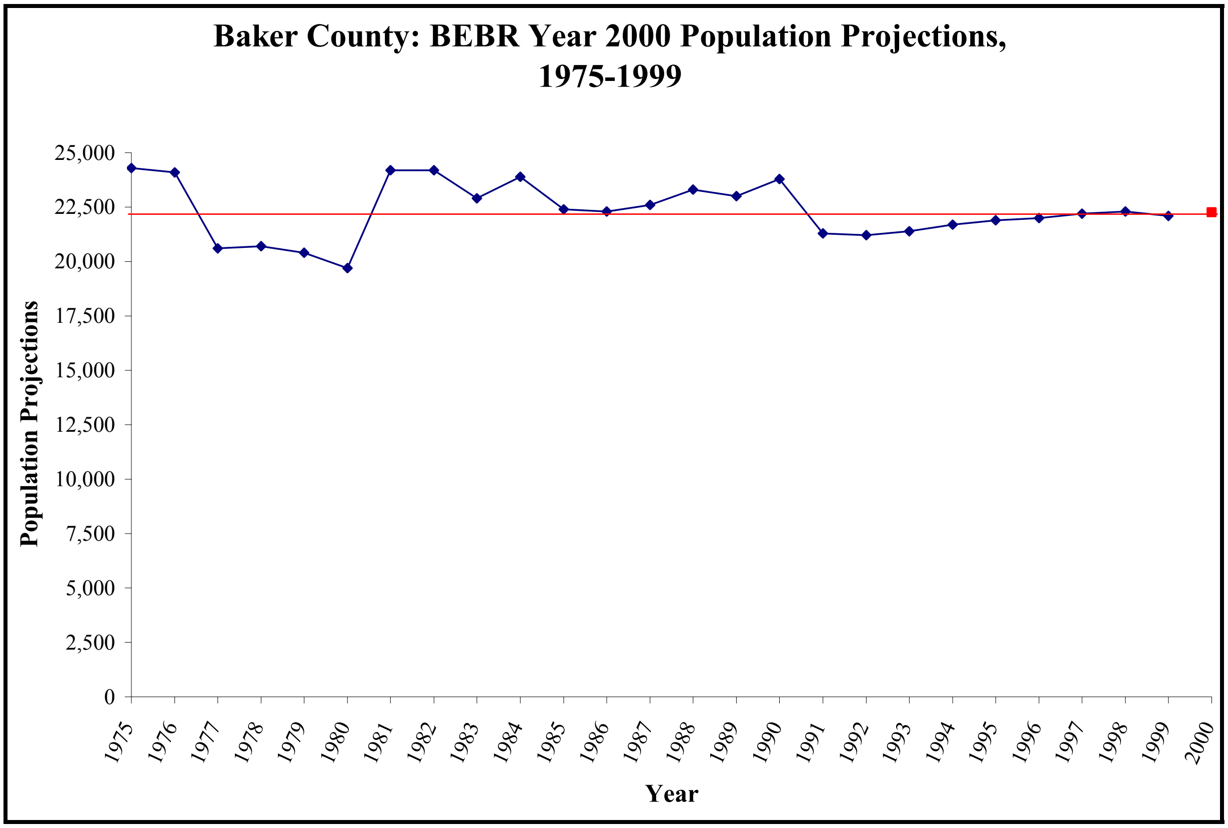
Smith, Stanley K and Terry Sincich (1990). The Relationship between the Length of the Base Period and Population Forecast Errors. *Journal of the American Statistical Association*, 85: 367-375.

A study of the relationship between the length of the base period (time period from which historical information is gathered to forecast future trends) and population forecast errors is presented by the authors. They use three forecasting techniques and data from 1900 to 1980 for states in the U.S.

APPENDIX B BEBR PROJECTION ERROR CHARTS



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2,500
0
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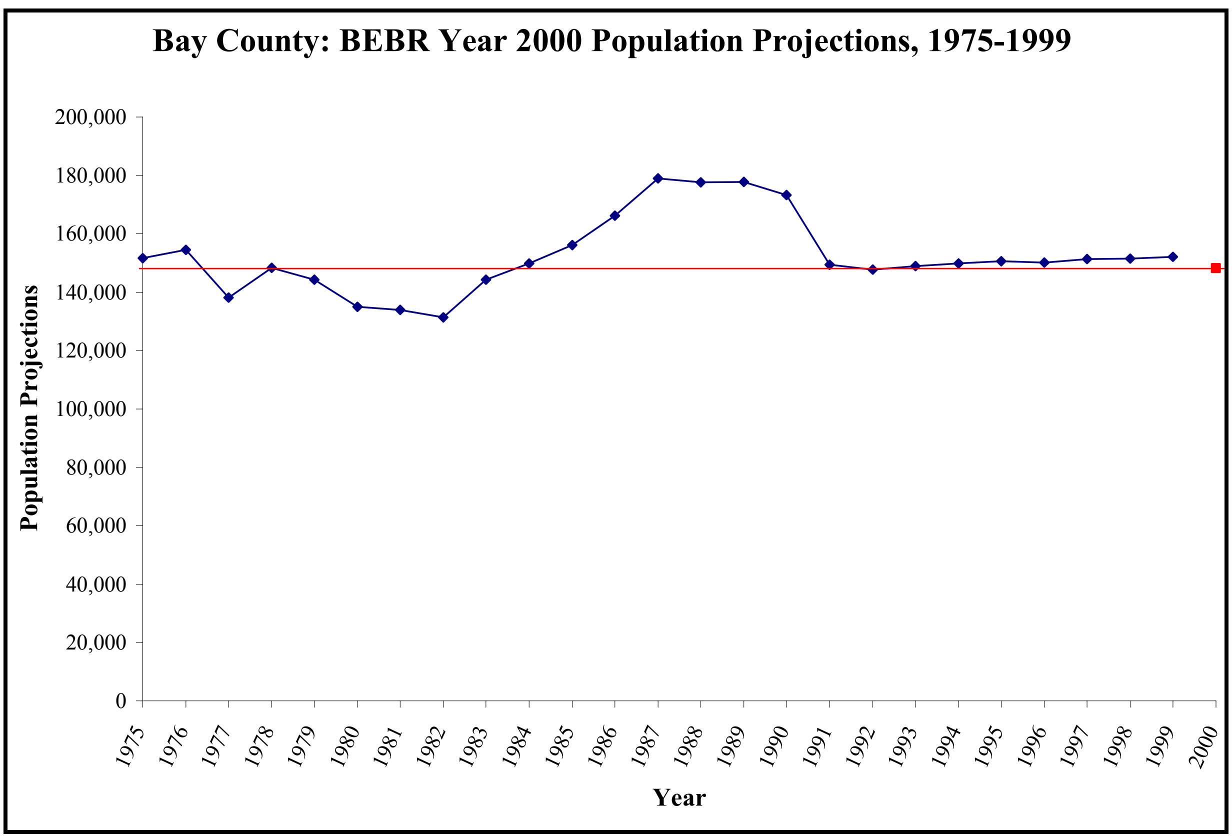
Year


Bay County: BEBR Year 2000 Population Projections, 1975-1999
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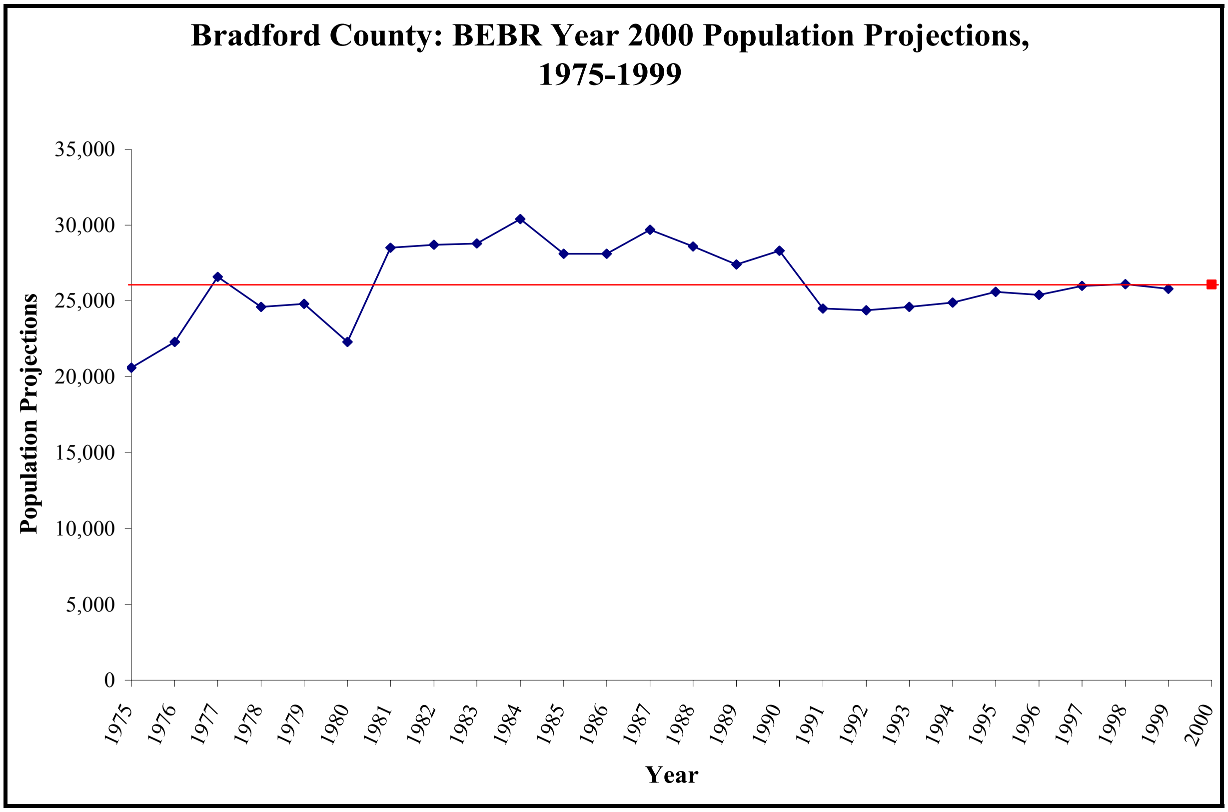
Year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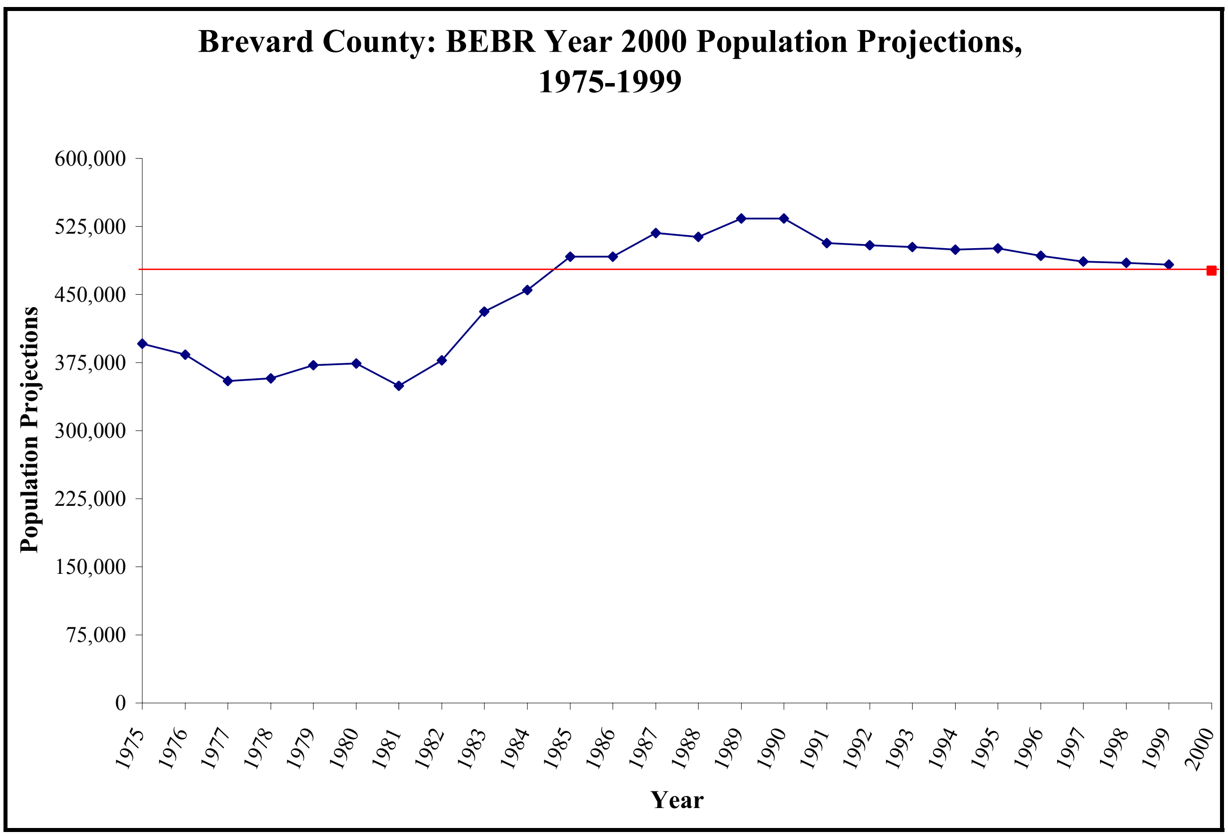
Year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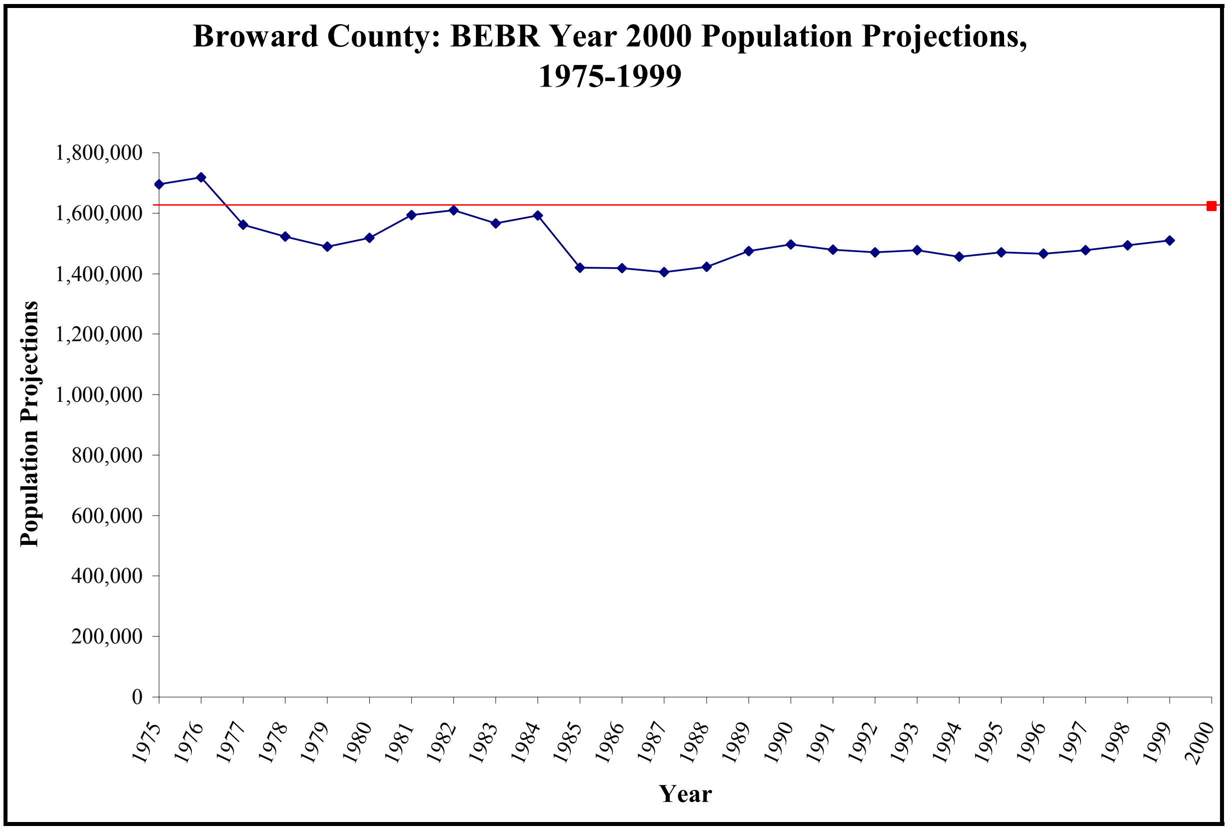
Year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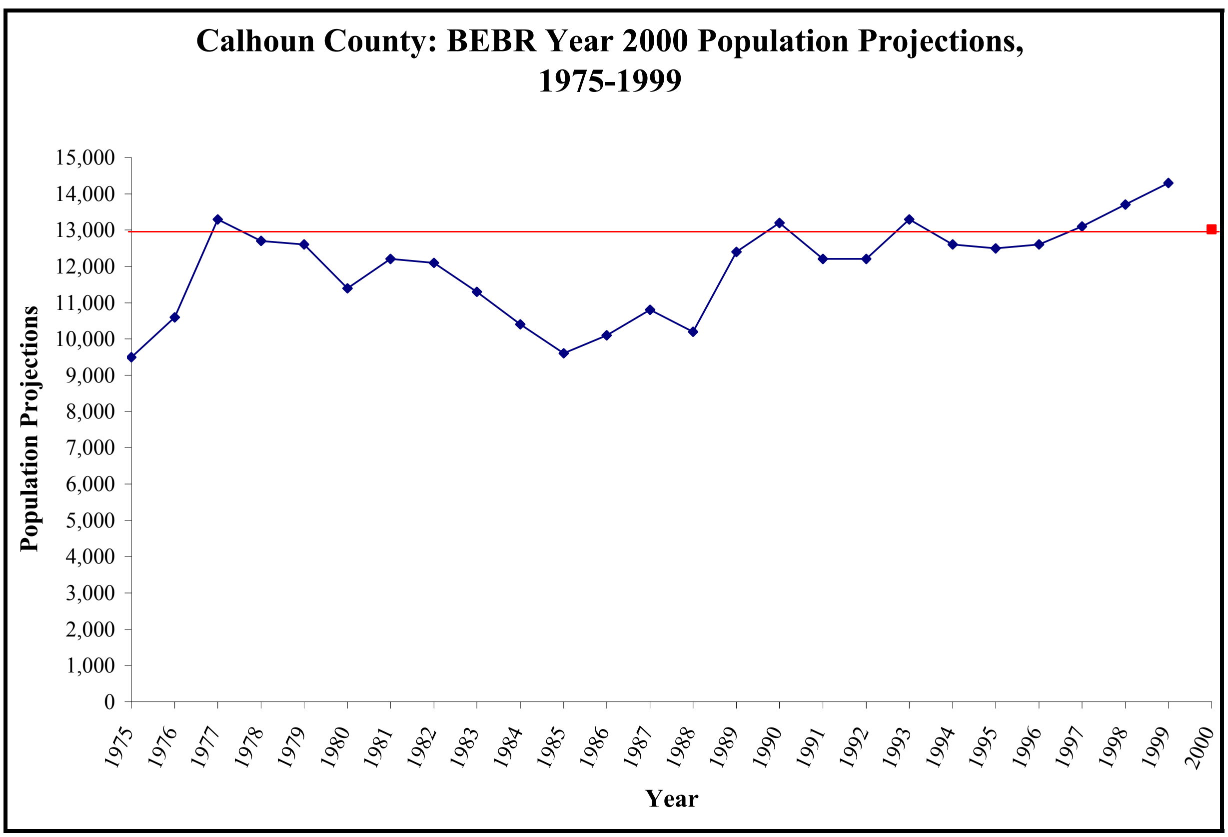
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Population Projections
Year
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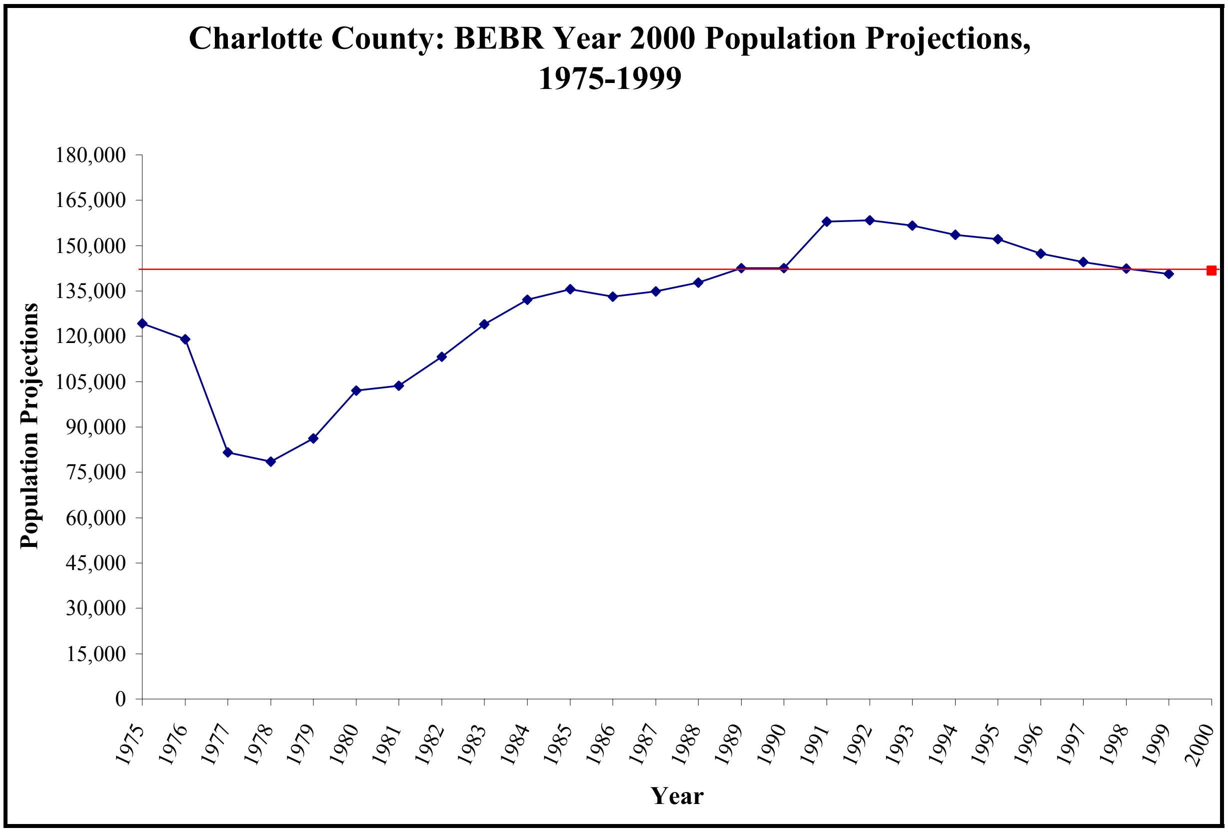
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Population Projections
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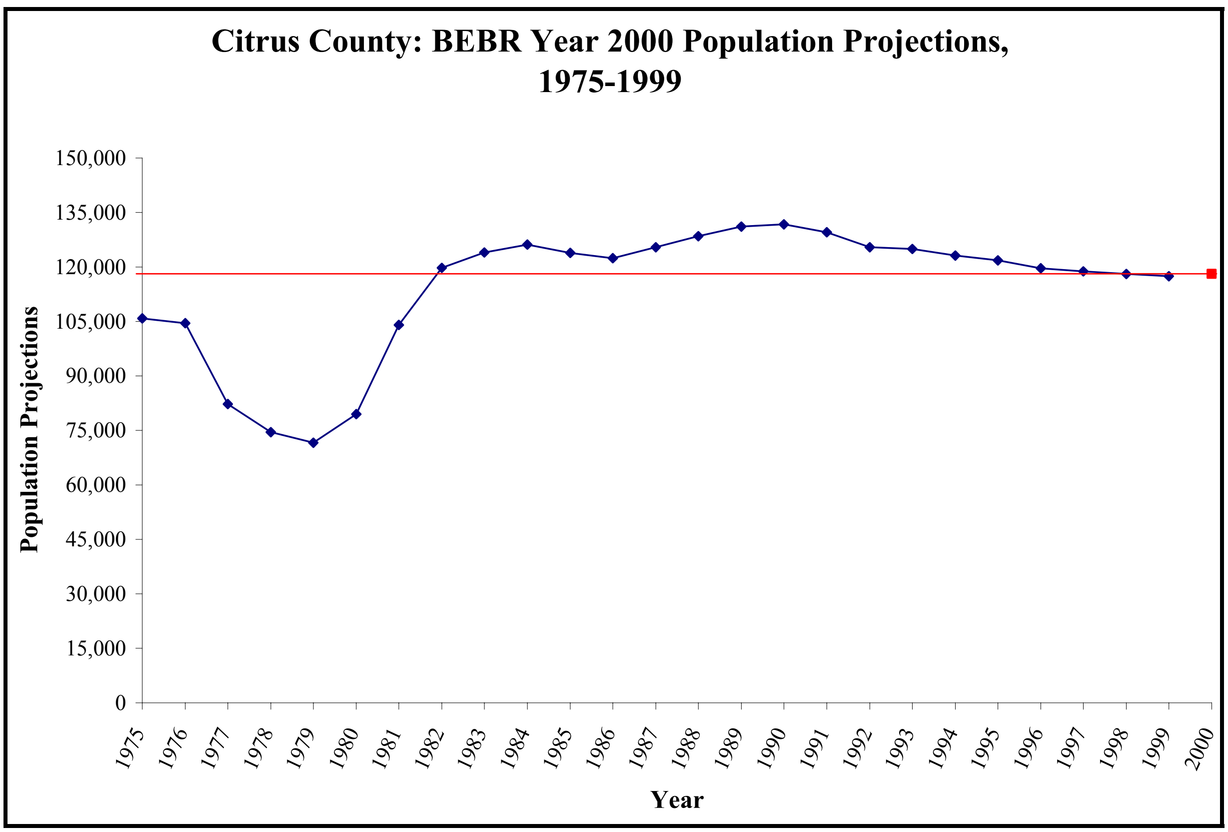
Year


Citrus County: BEBR Year 2000 Population Projections, 1975-1999
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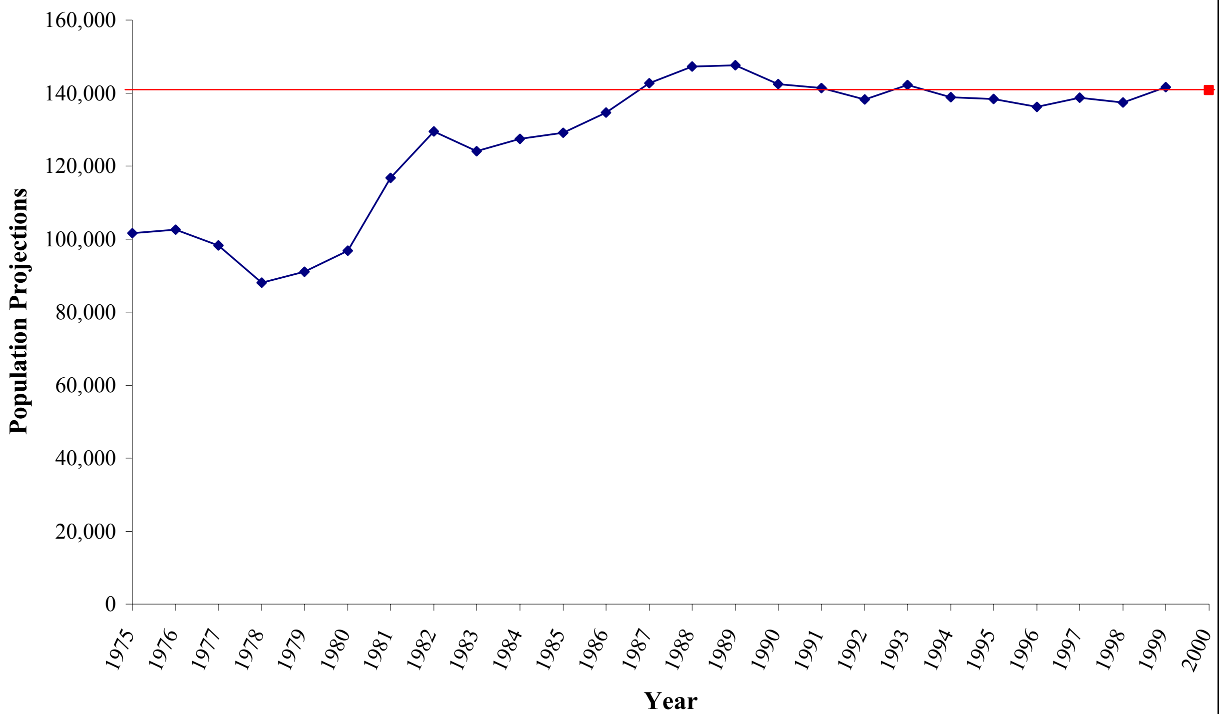
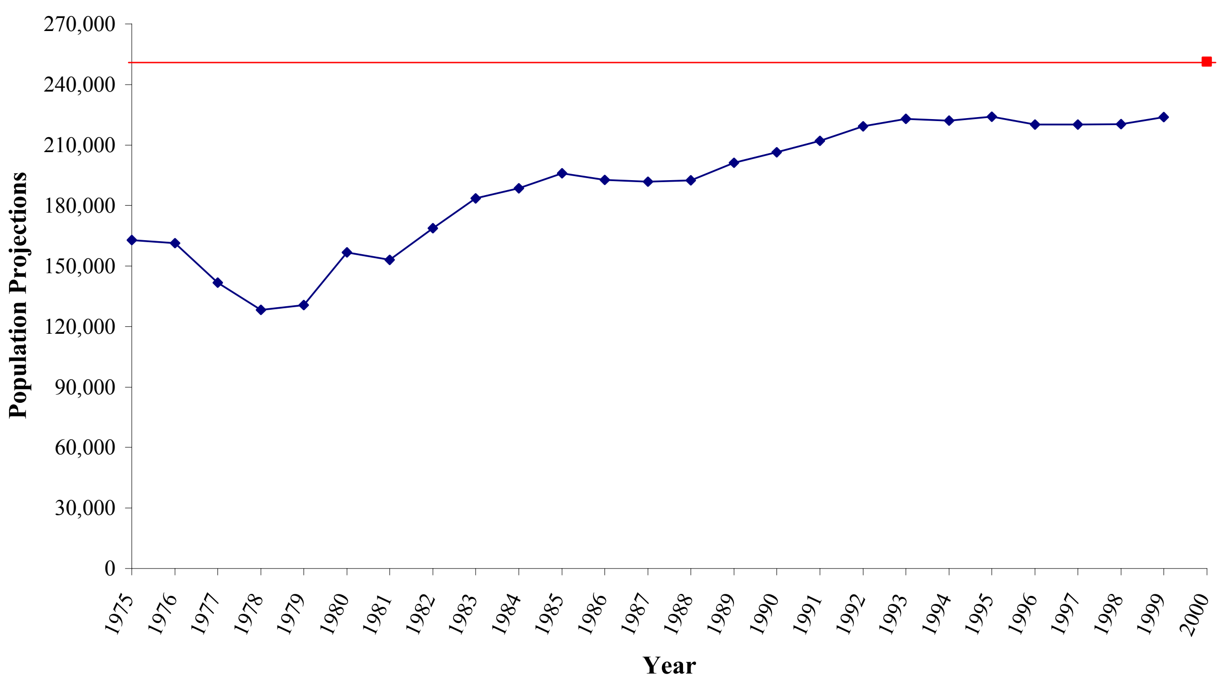
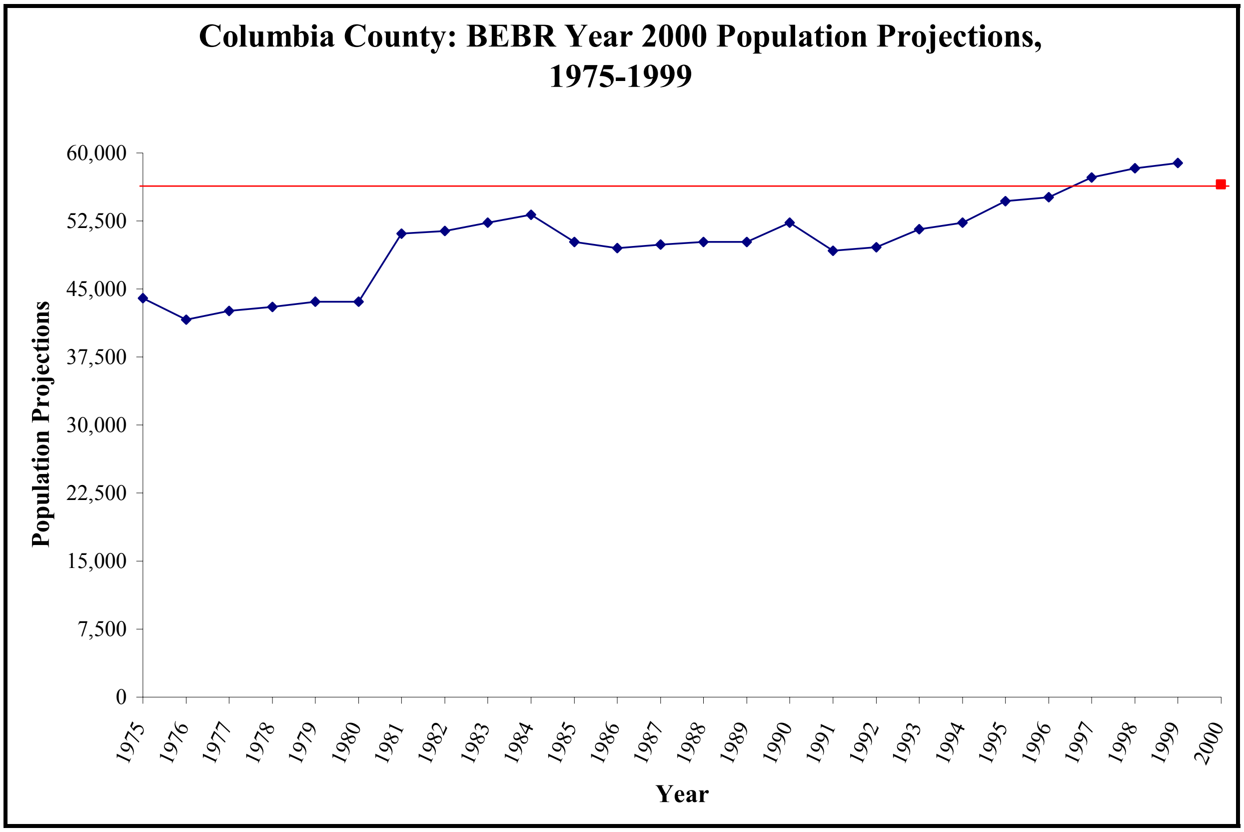
Population Projections
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

Clay County: BEBR Year 2000 Population Projections, 1975-1999



Collier County: BEBR Year 2000 Population Projections, 1975-1999




Columbia County: BEBR Year 2000 Population Projections, 1975-1999
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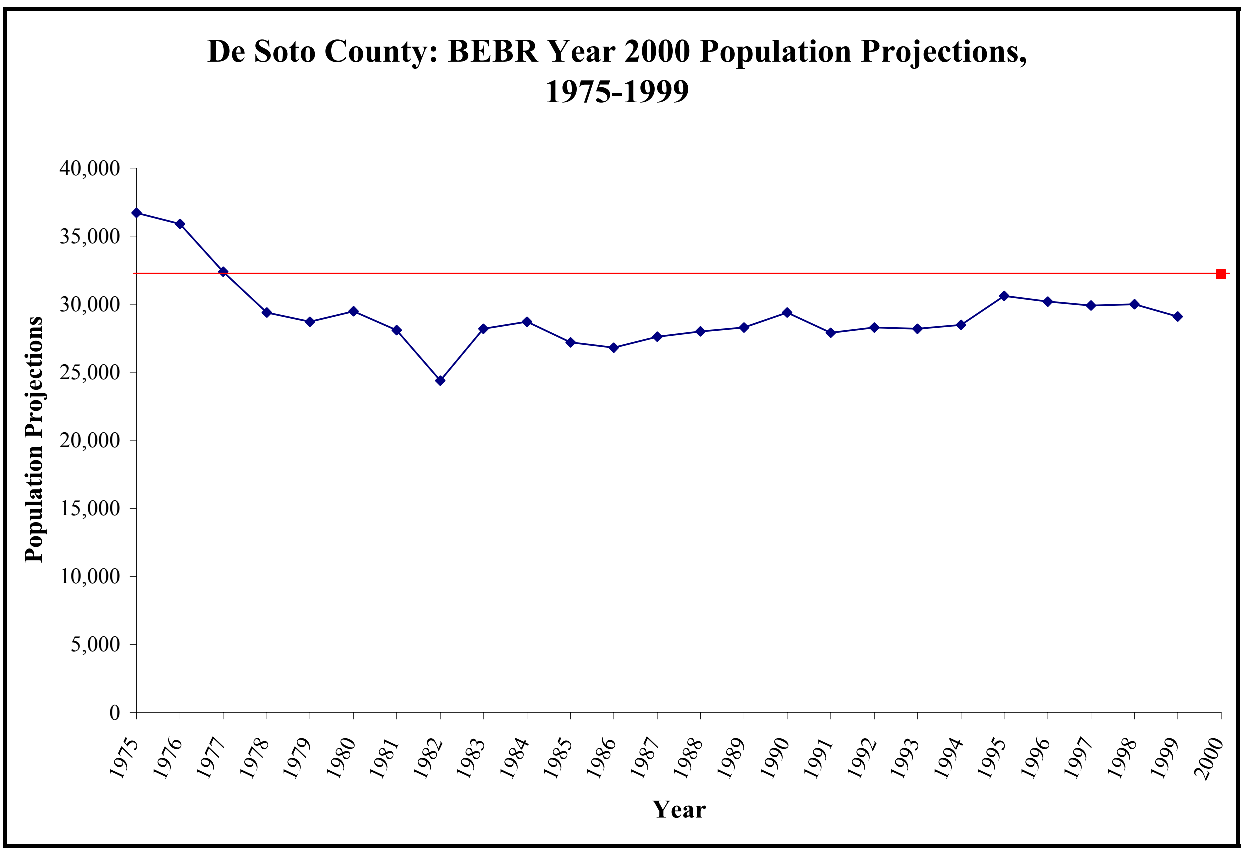
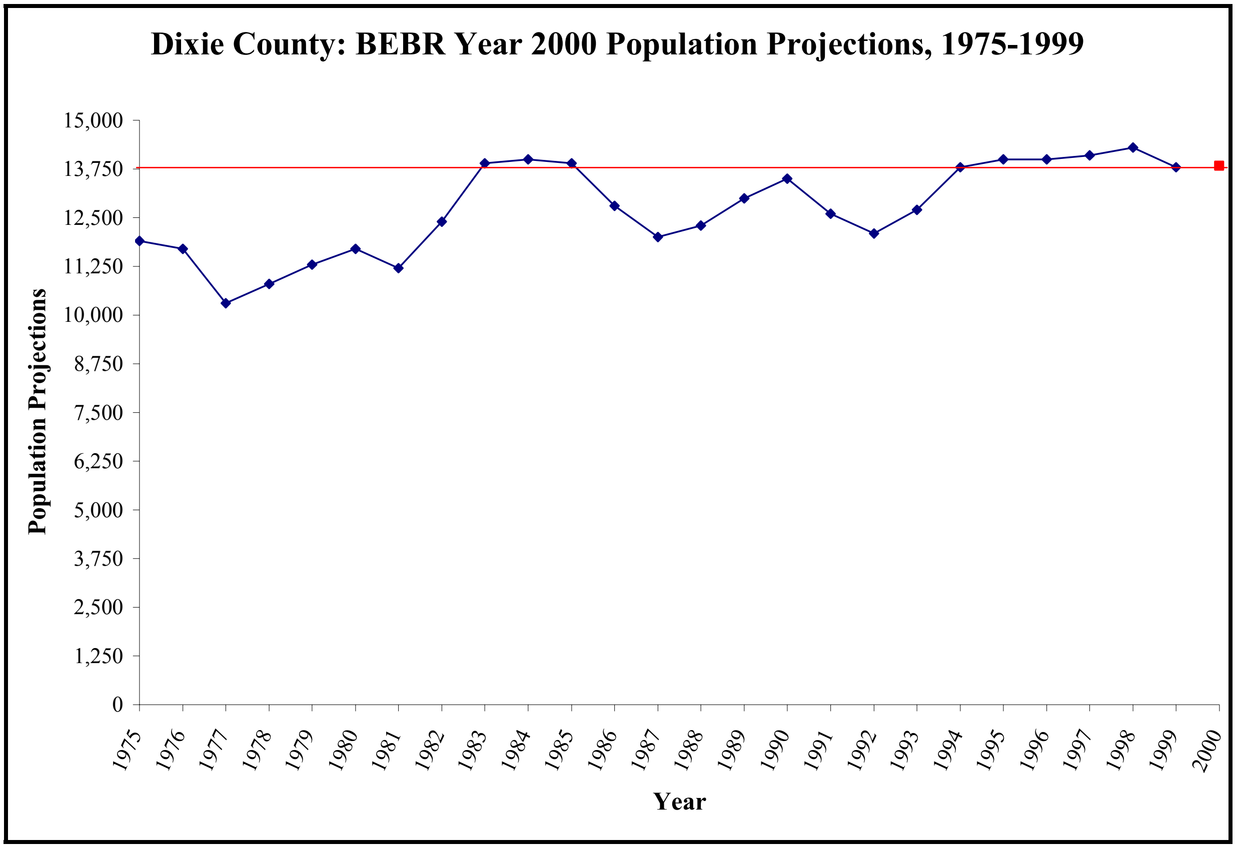
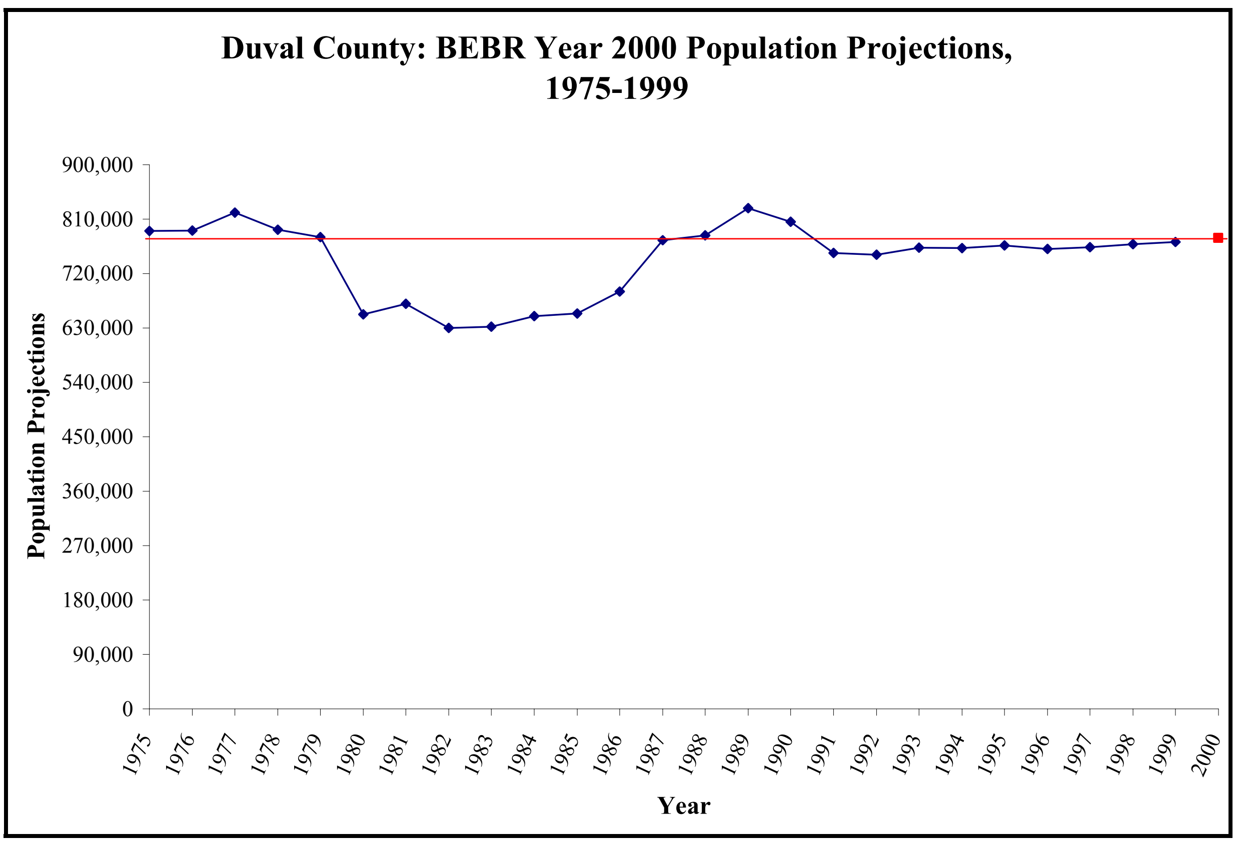
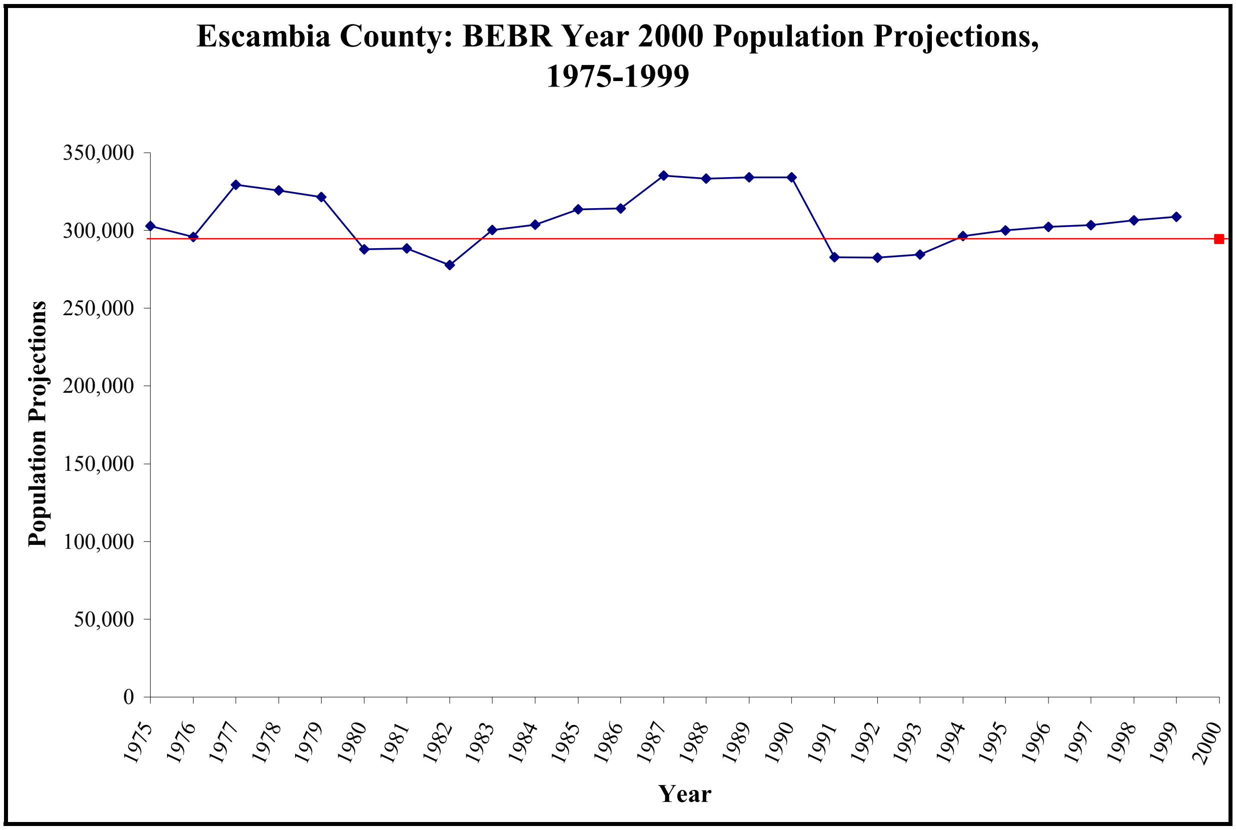
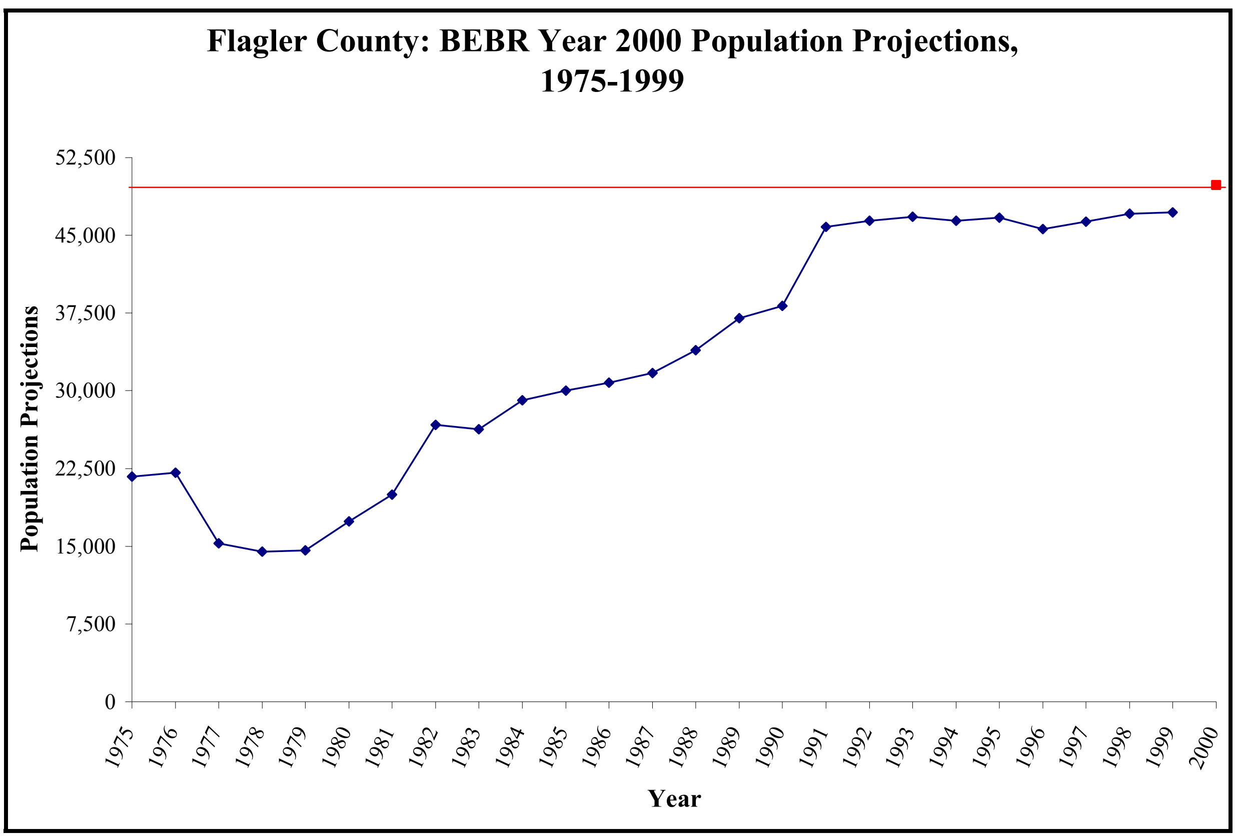
52,500
45,000
37,500
30,000
22,500
15,000
7,500
0
Population Projections
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

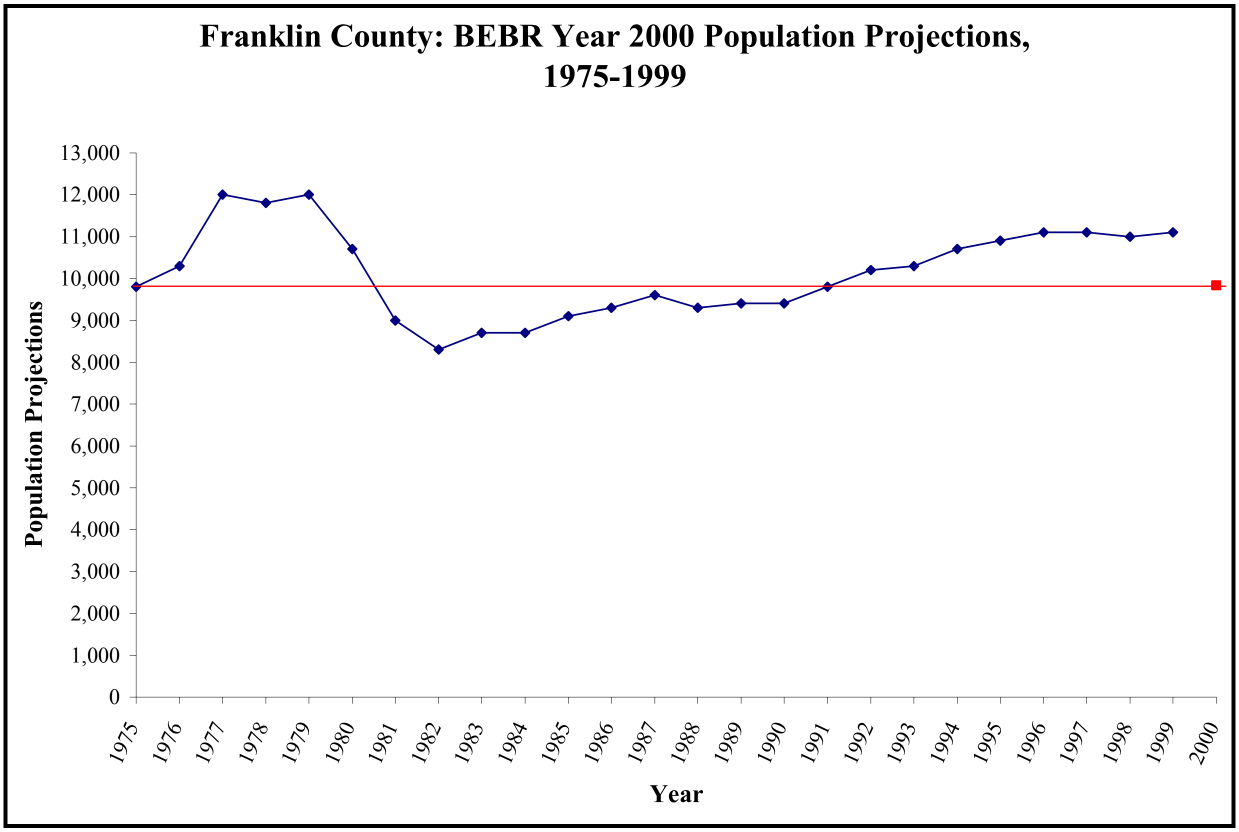

De Soto County: BEBR Year 2000 Population Projections, 1975-1999
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Population Projections
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year


Dixie County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
15,000
13,750
12,500
11,250
10,000
8,750
7,500
6,250
5,000
3,750
2,500
1,250
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

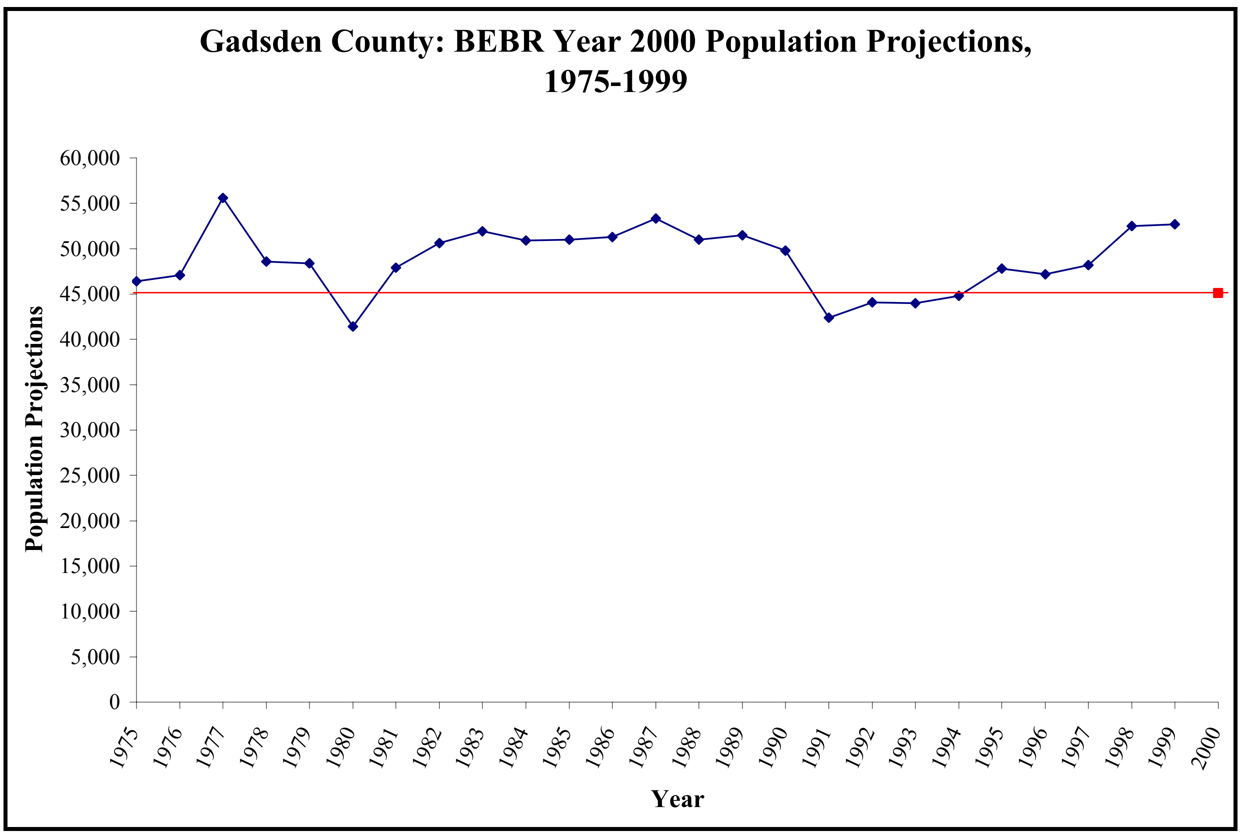

Duval County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
900,000
810,000
720,000
630,000
540,000
450,000
360,000
270,000
180,000
90,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year


Escambia County: BEBR Year 2000 Population Projections, 1975-1999
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Population Projections
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

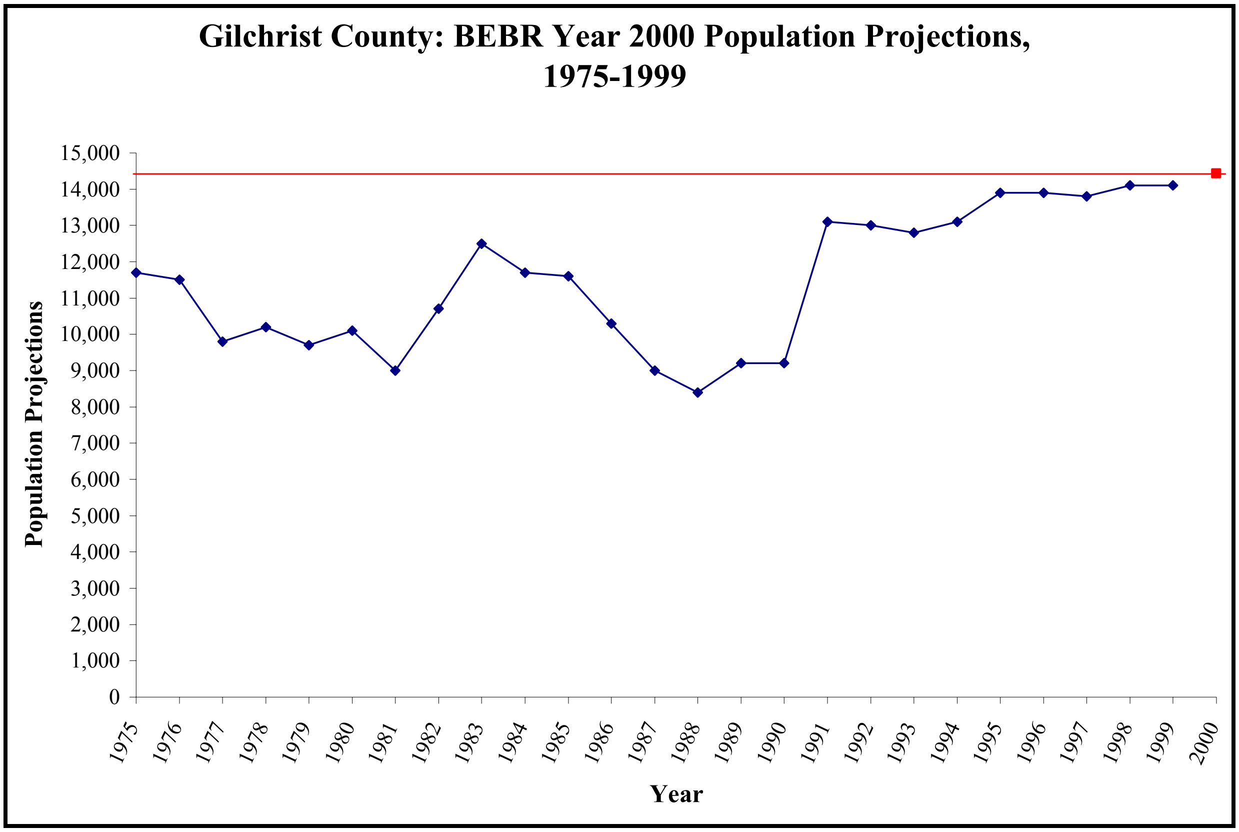

Flagler County: BEBR Year 2000 Population Projections, 1975-1999
52,500
45,000
37,500
30,000
22,500
15,000
7,500
0
Population Projections
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

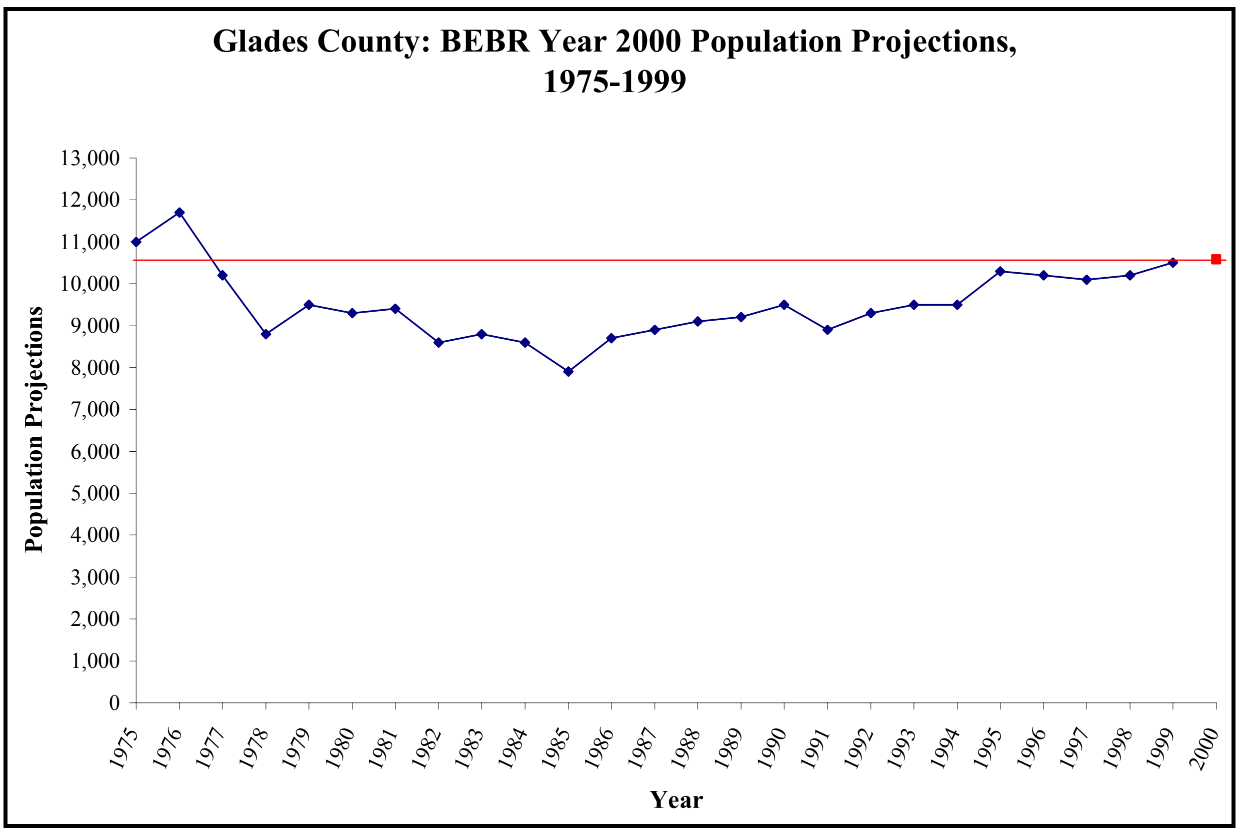


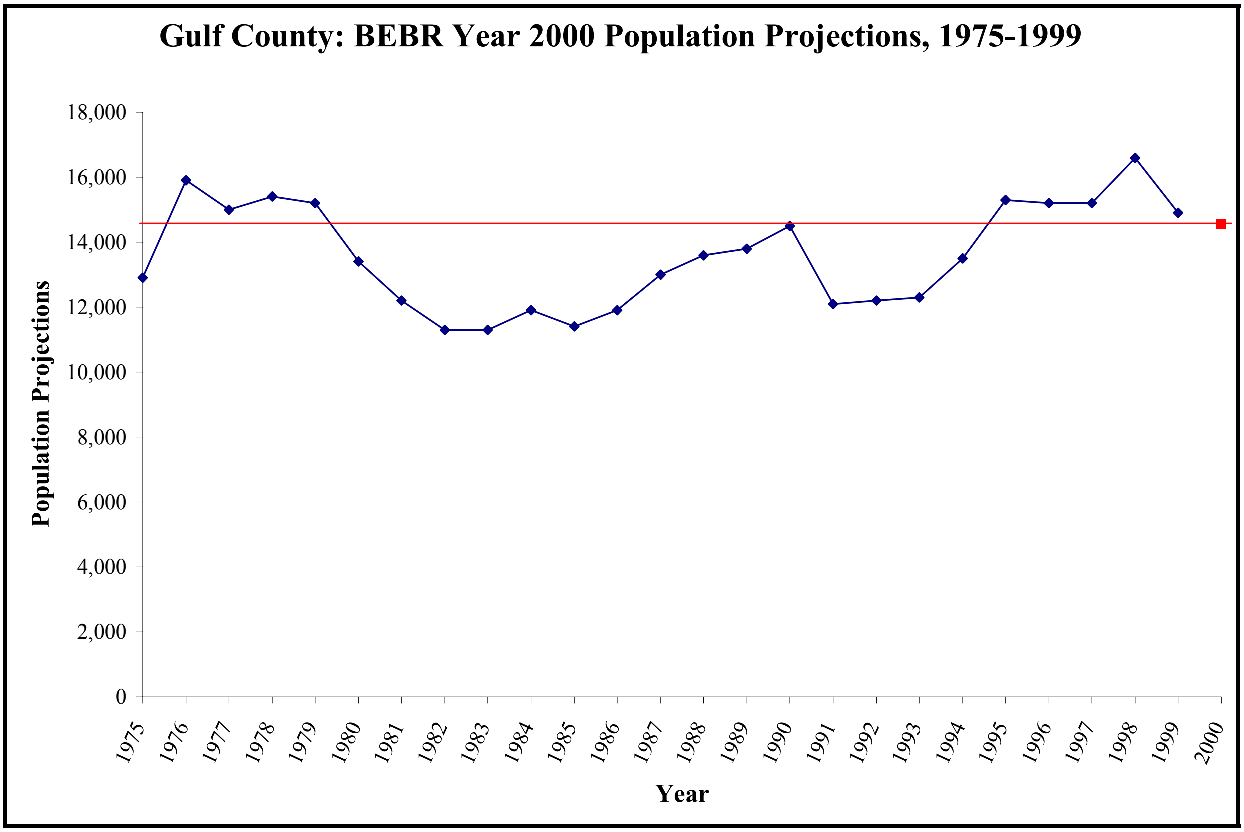
Franklin County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

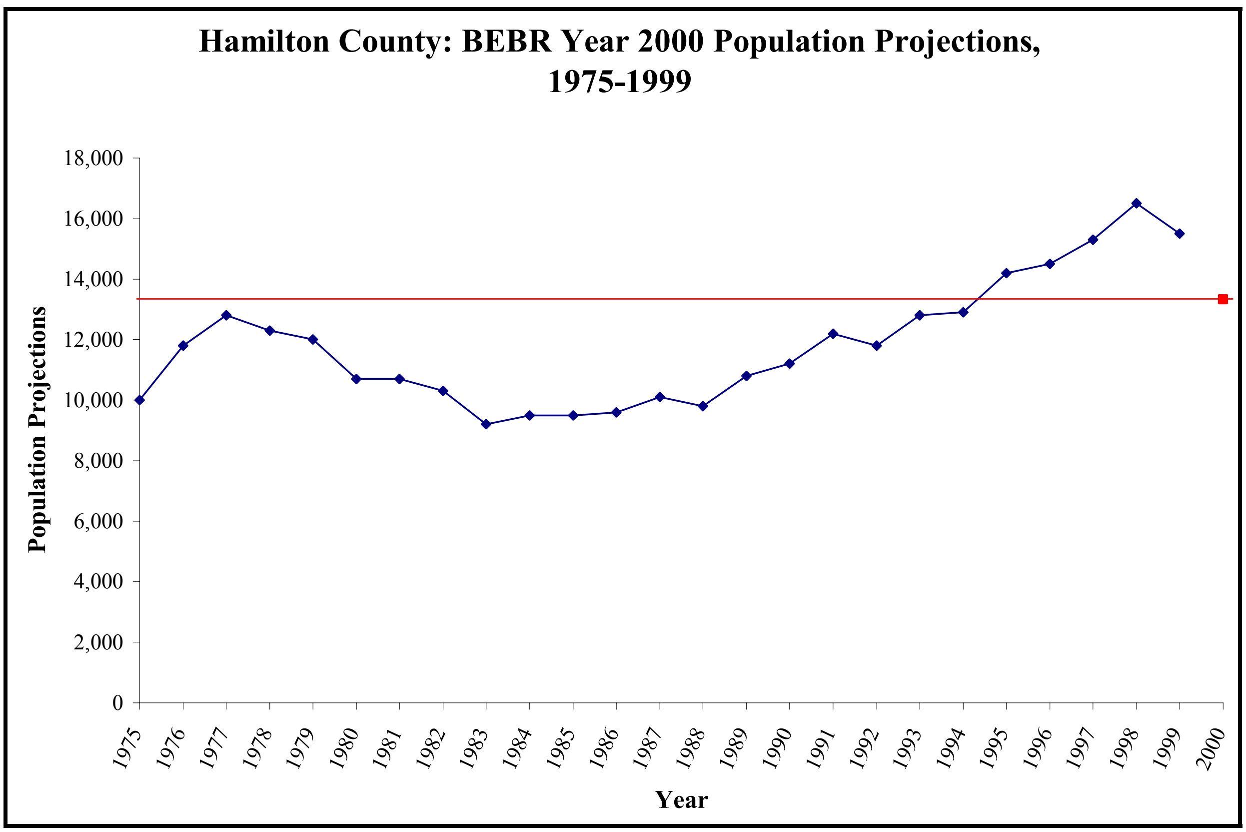


Gadsden County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
60,000
55,000
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

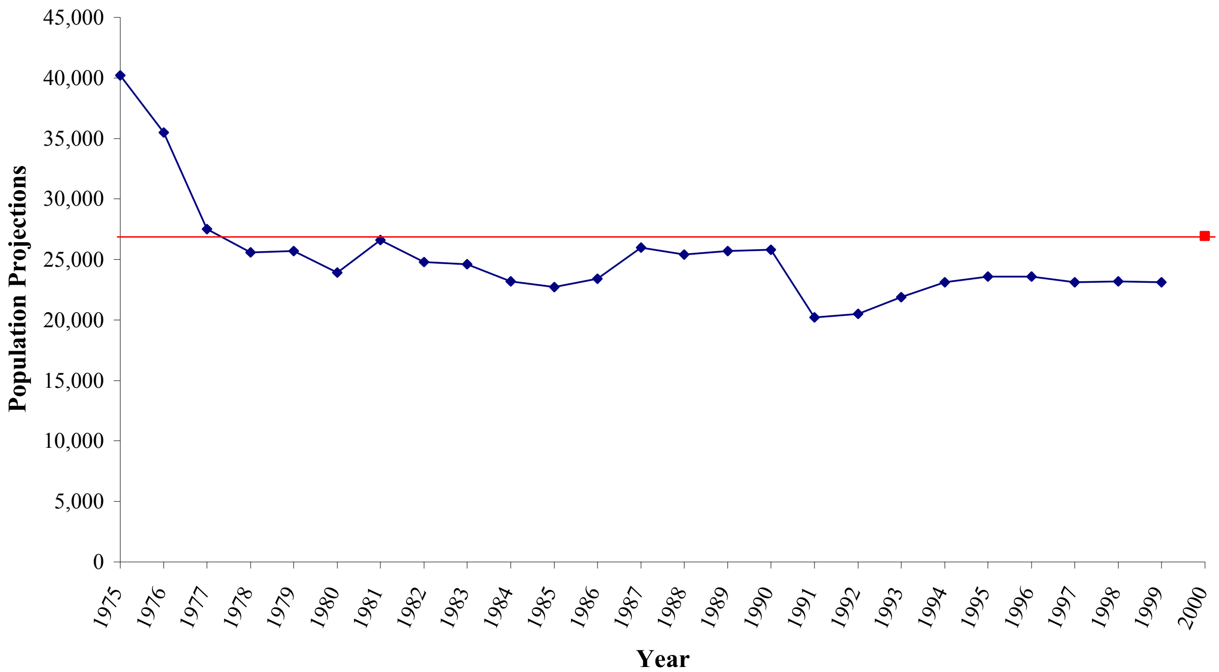

Gilchrist County: BEBR Year 2000 Population Projections,
1975-1999
Population Projections
15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year


Glades County: BEBR Year 2000 Population Projections,
1975-1999
Population Projections
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

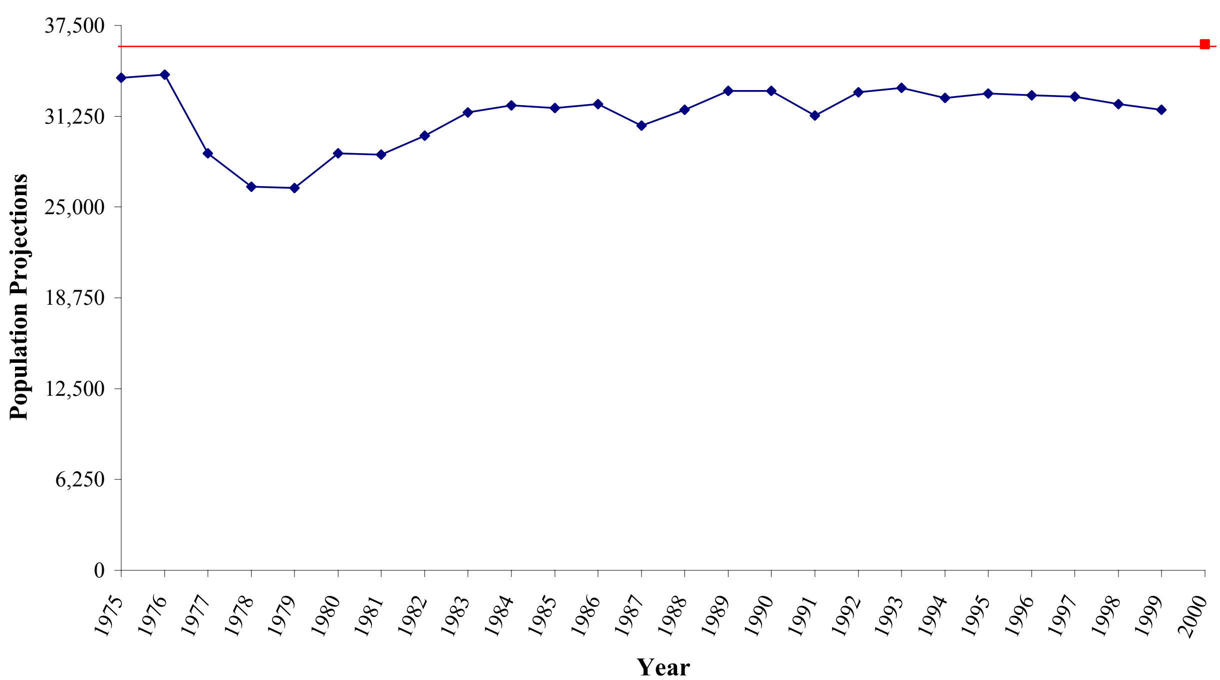

Gulf County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
16,000
18,000
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

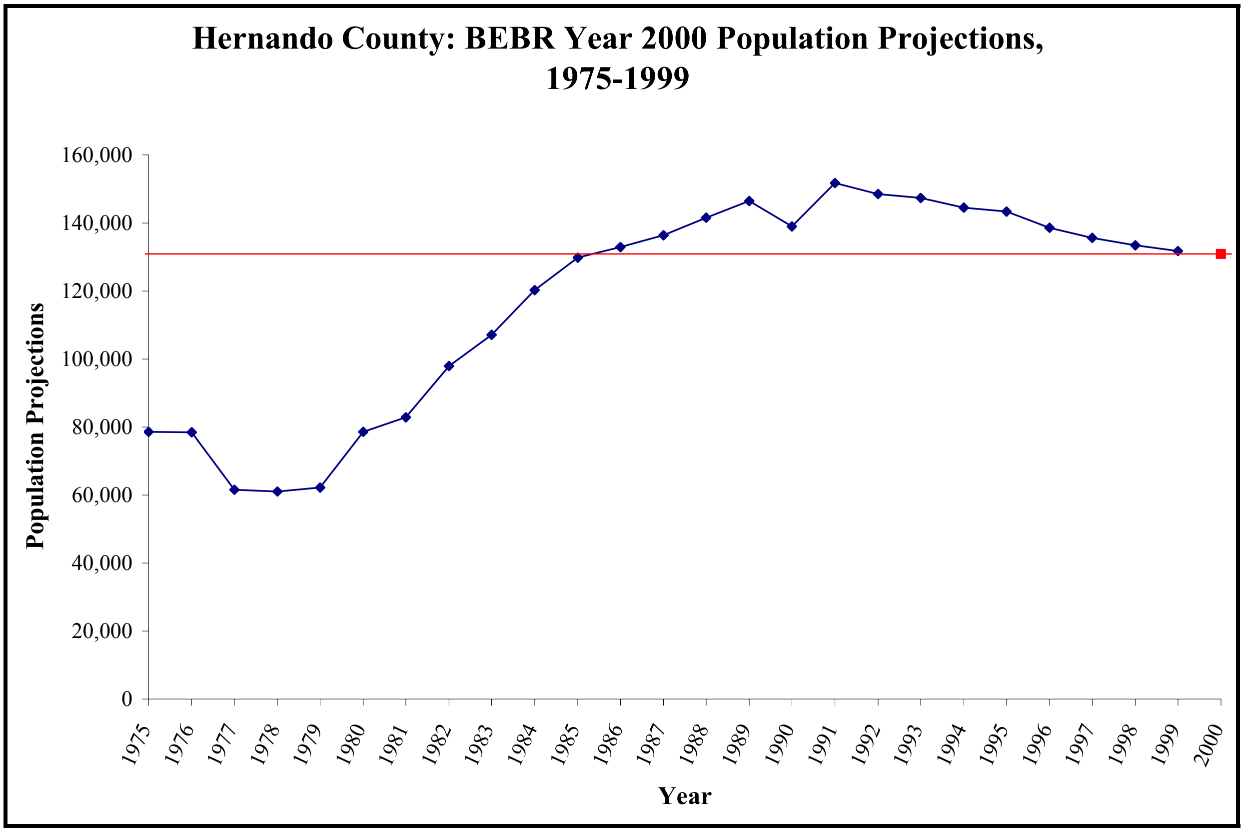

Hamilton County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
16,000
18,000
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

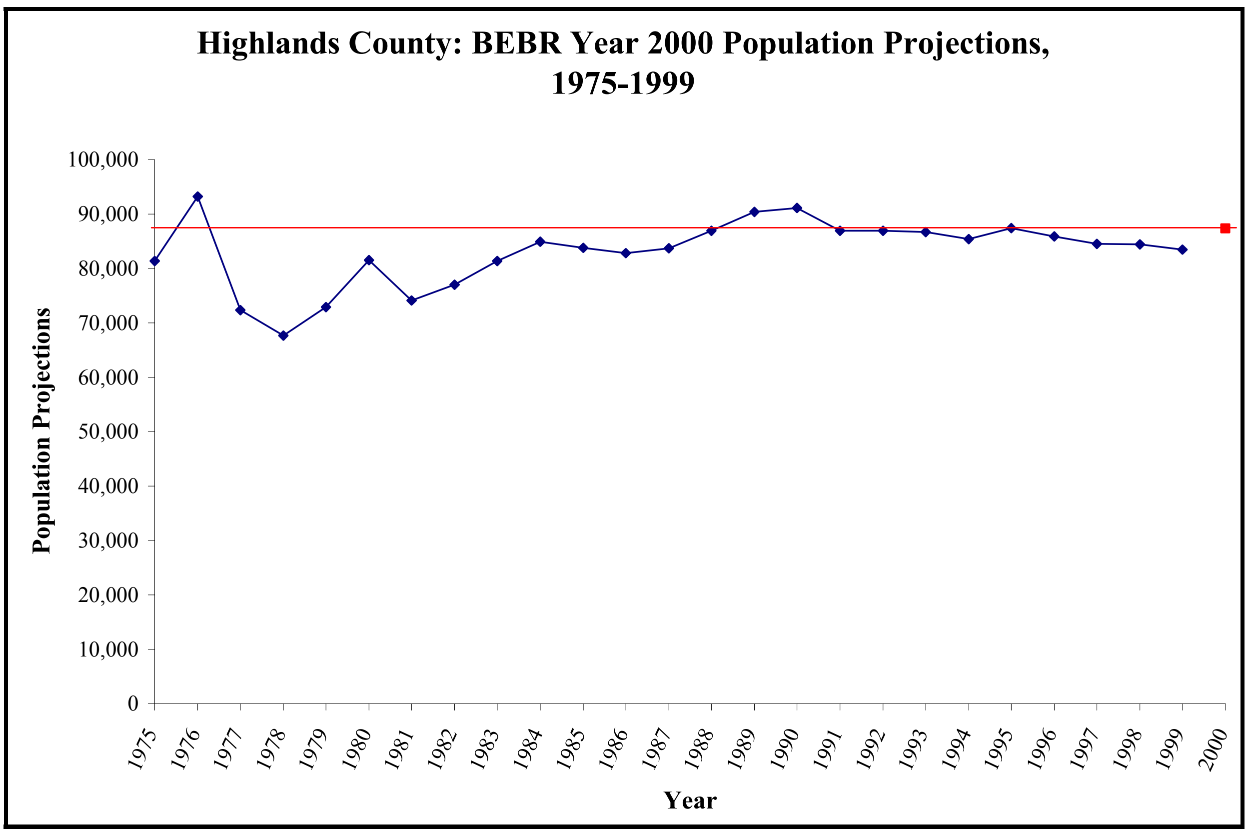
Hardee County: BEBR Year 2000 Population Projections, 1975-1999

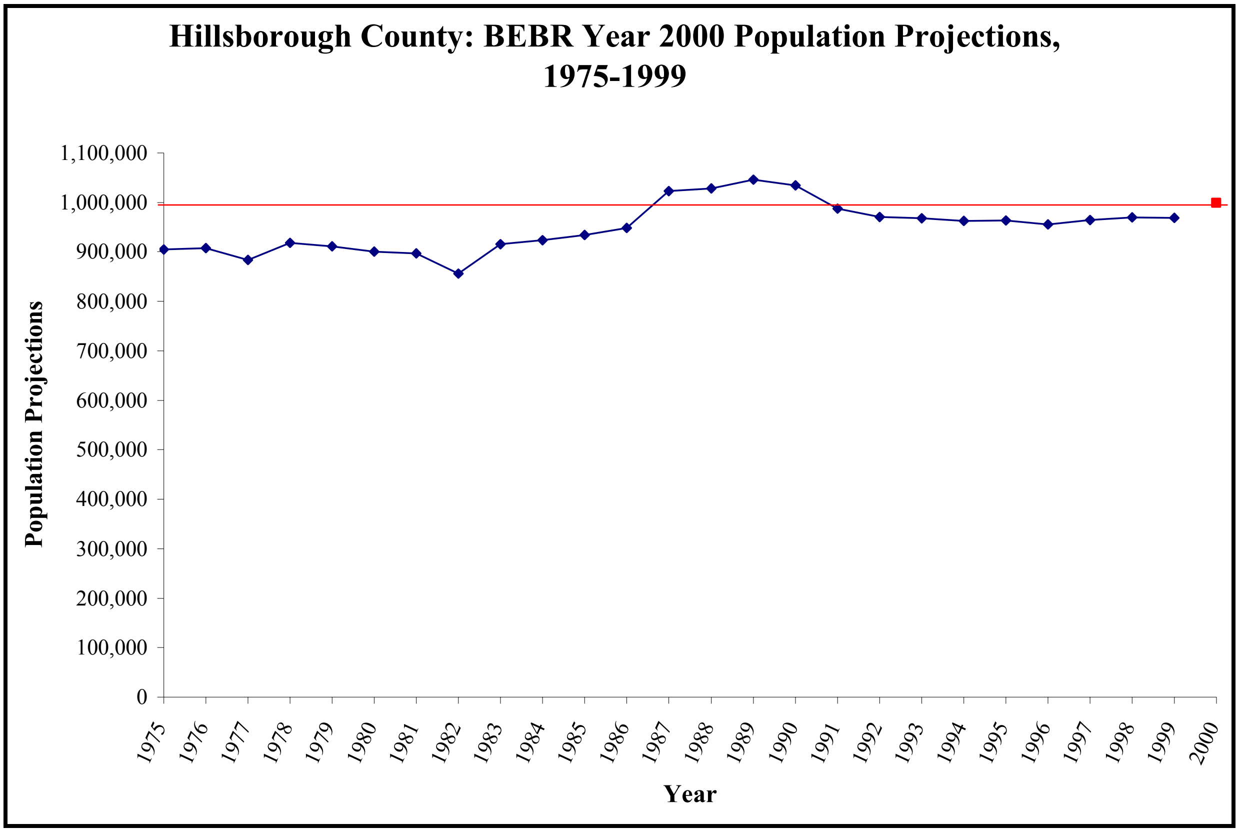


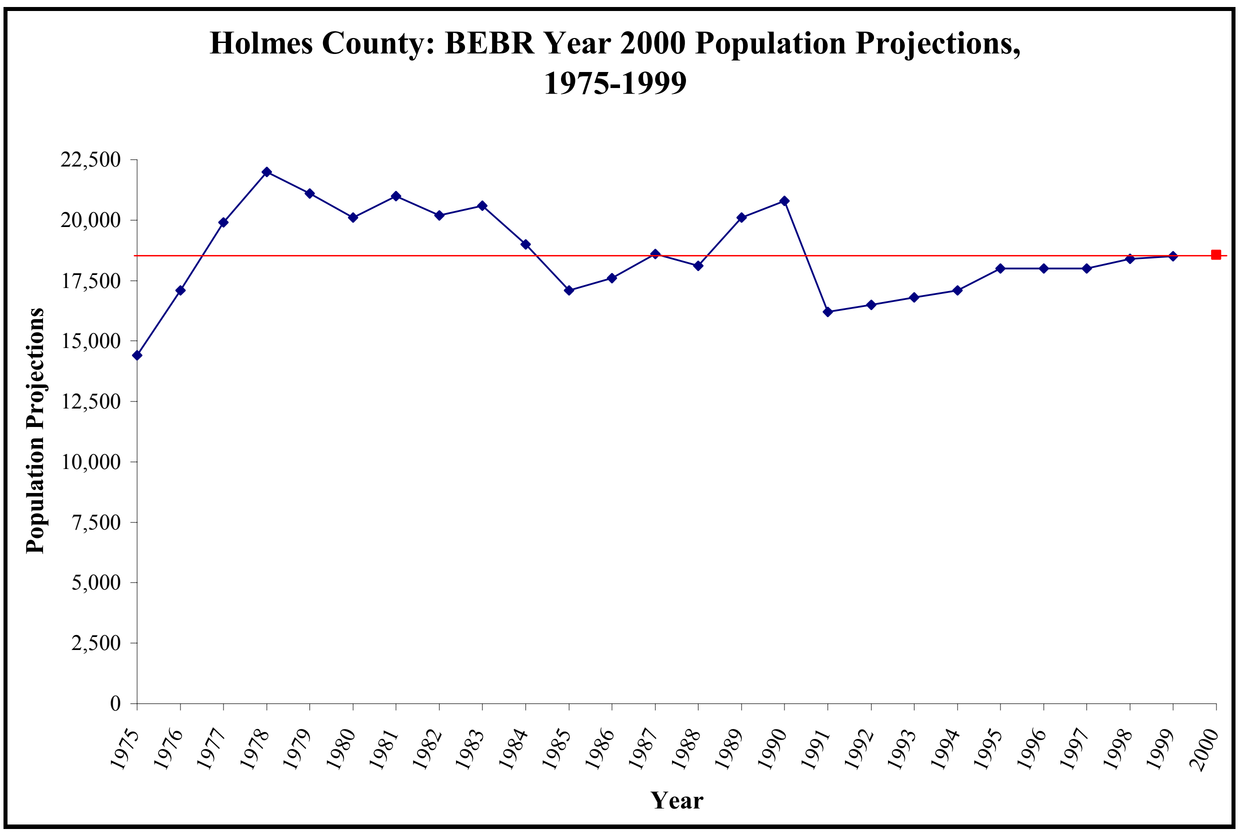
Hendry County: BEBR Year 2000 Population Projections, 1975-1999

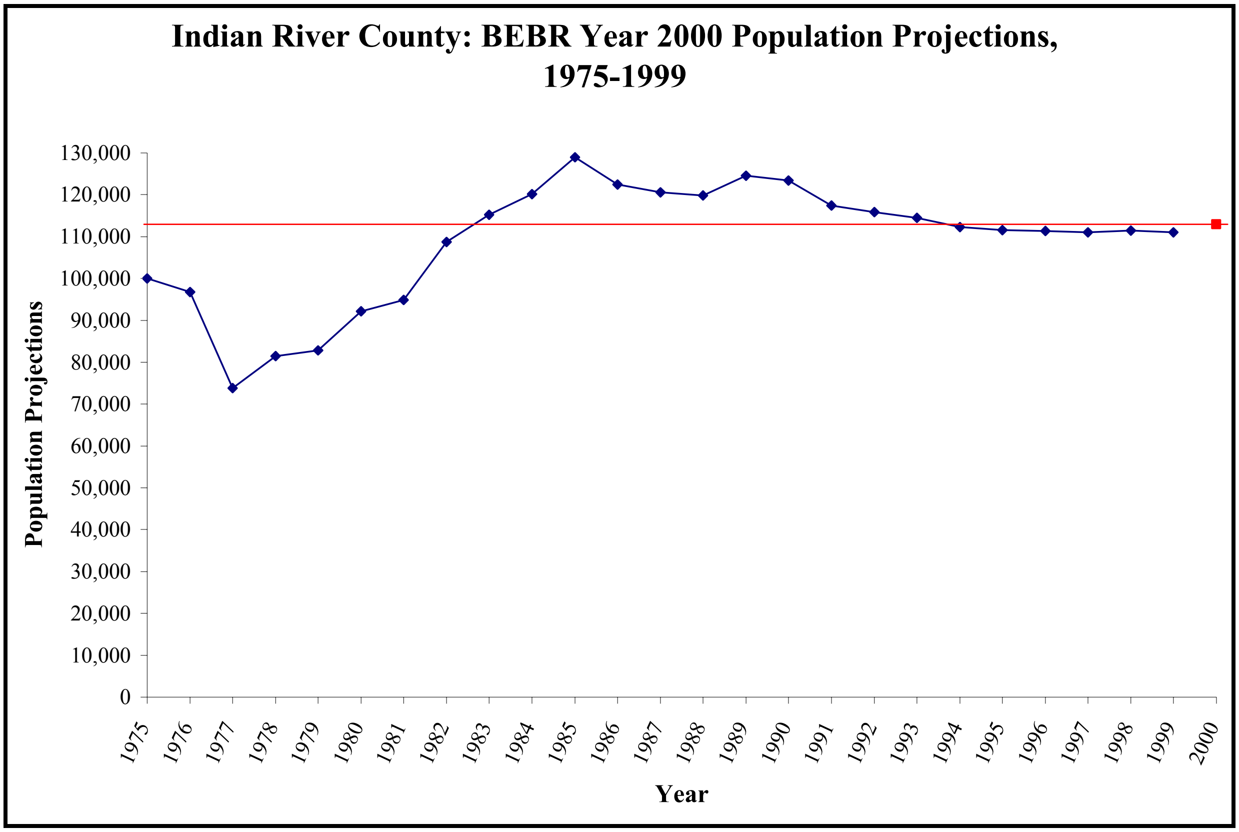


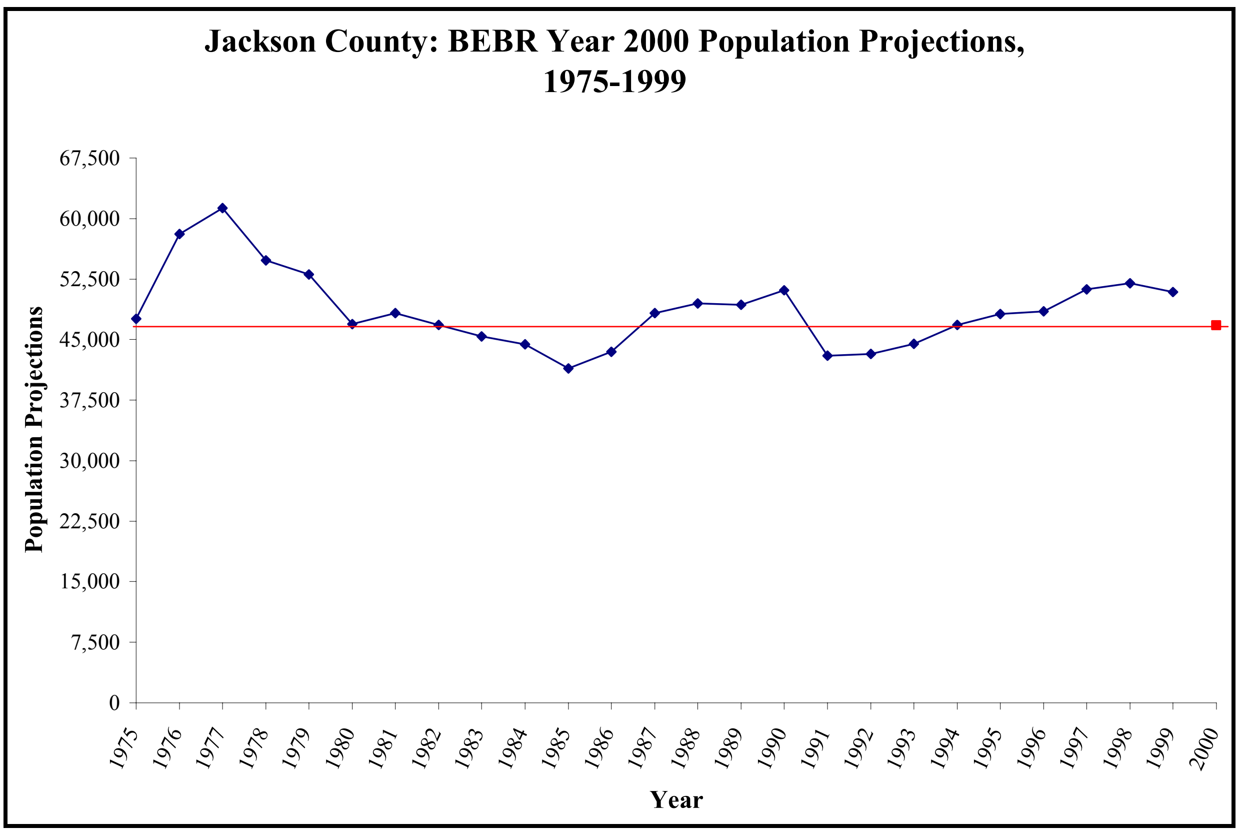

Hernando County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

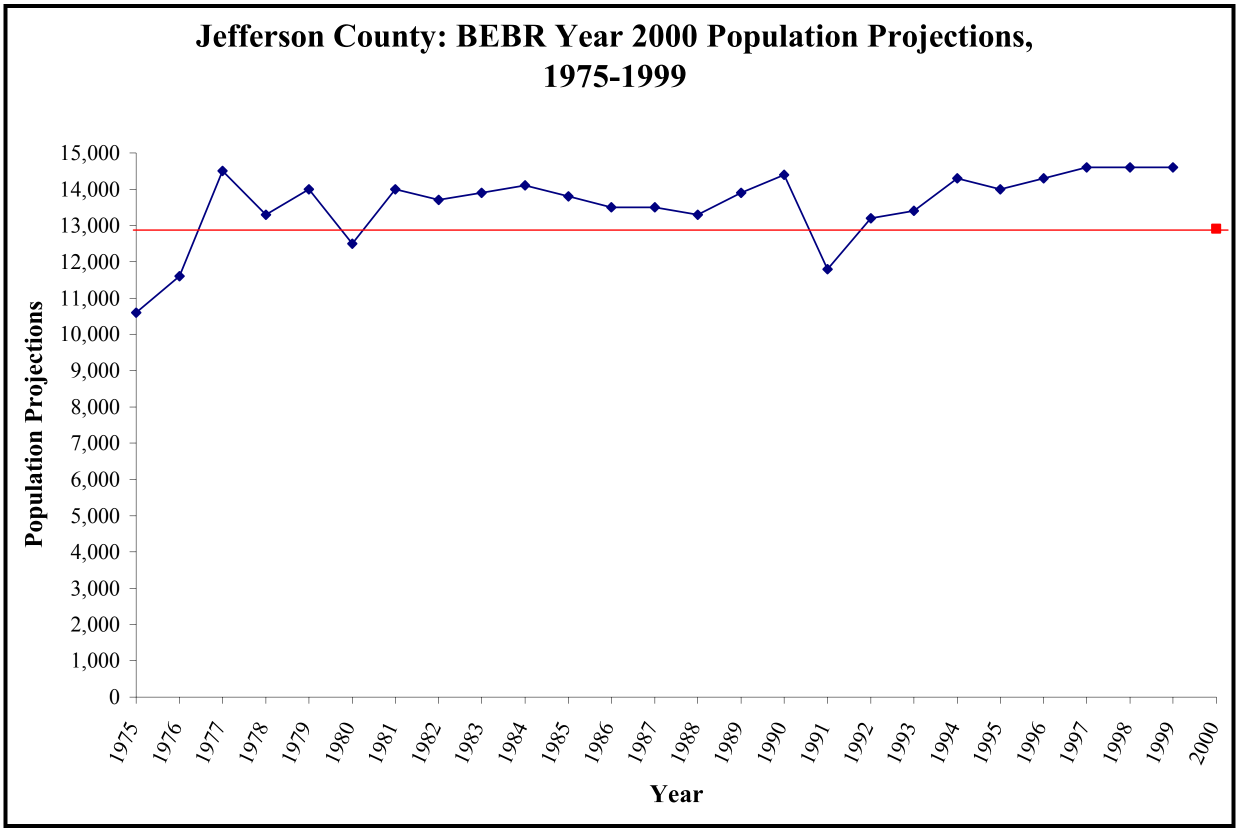

Highlands County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

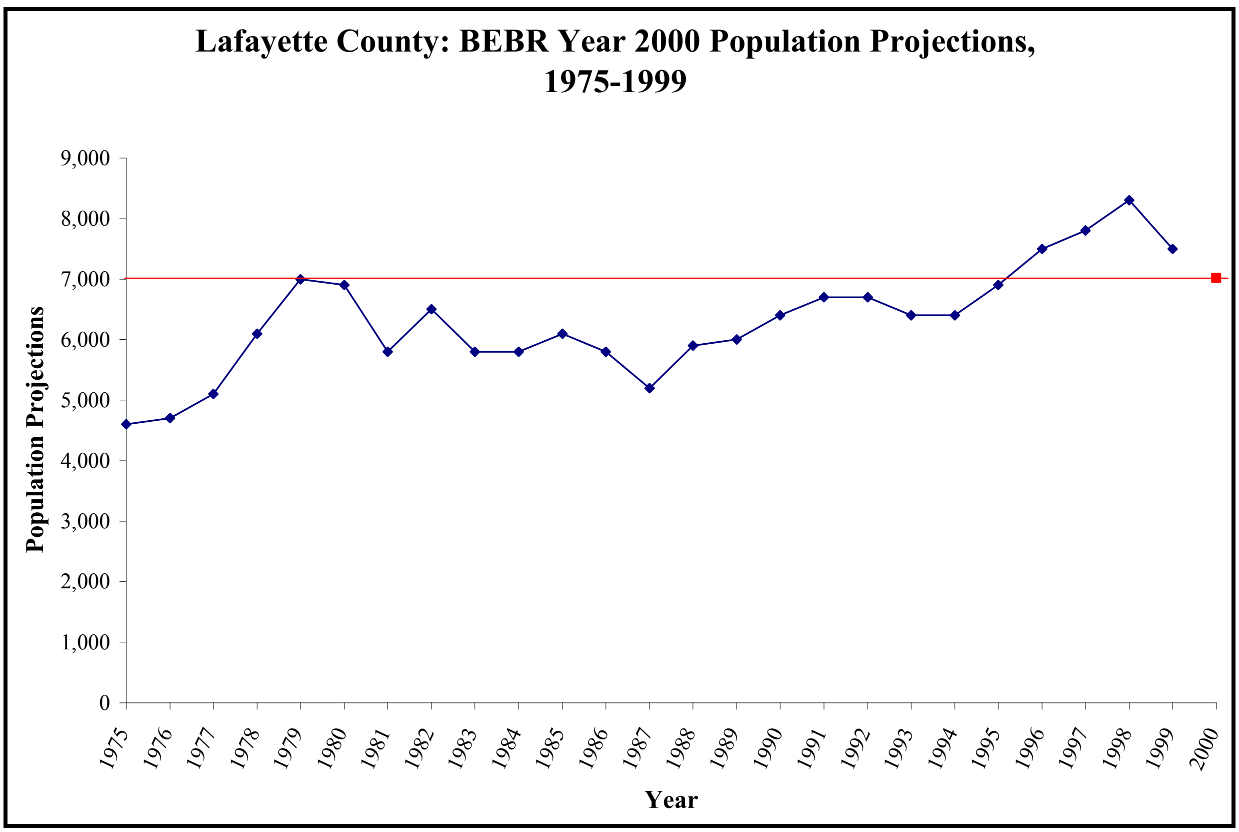

Hillsborough County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

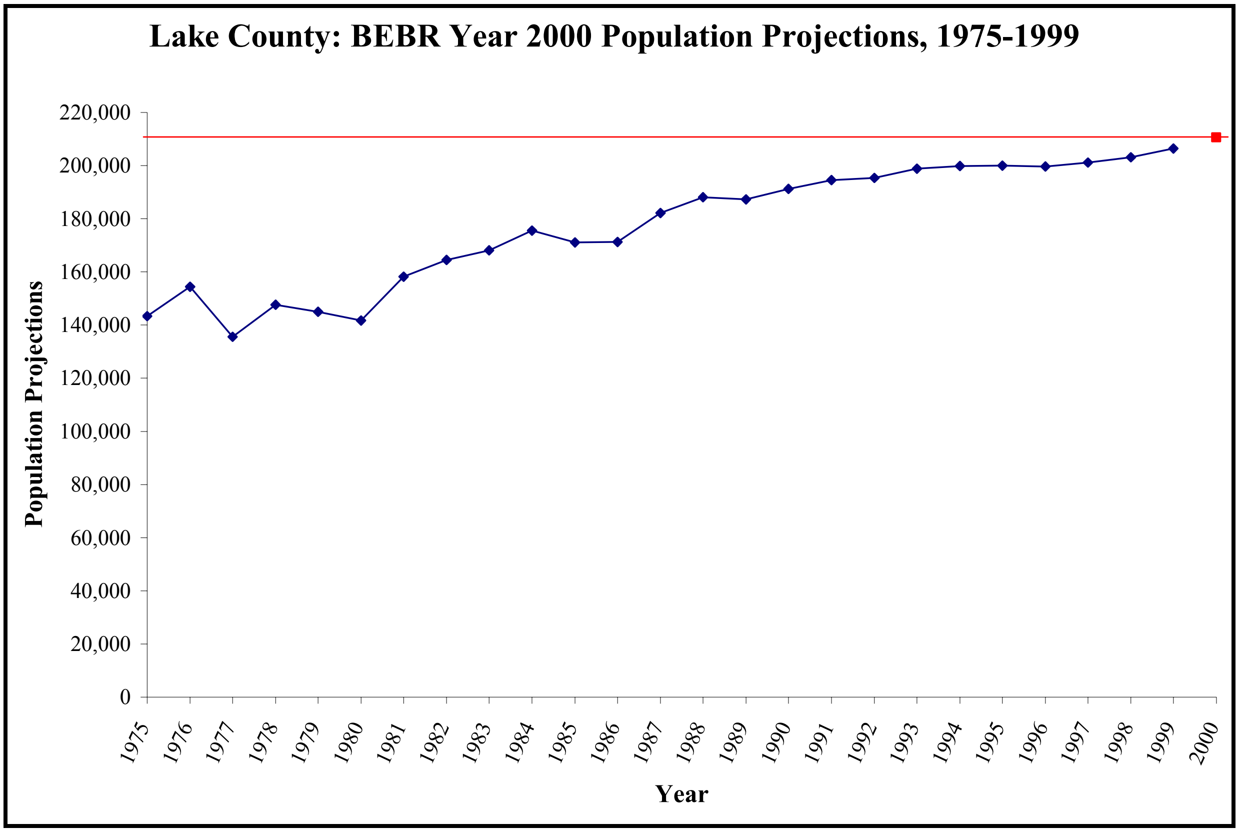

Holmes County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
22,500
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

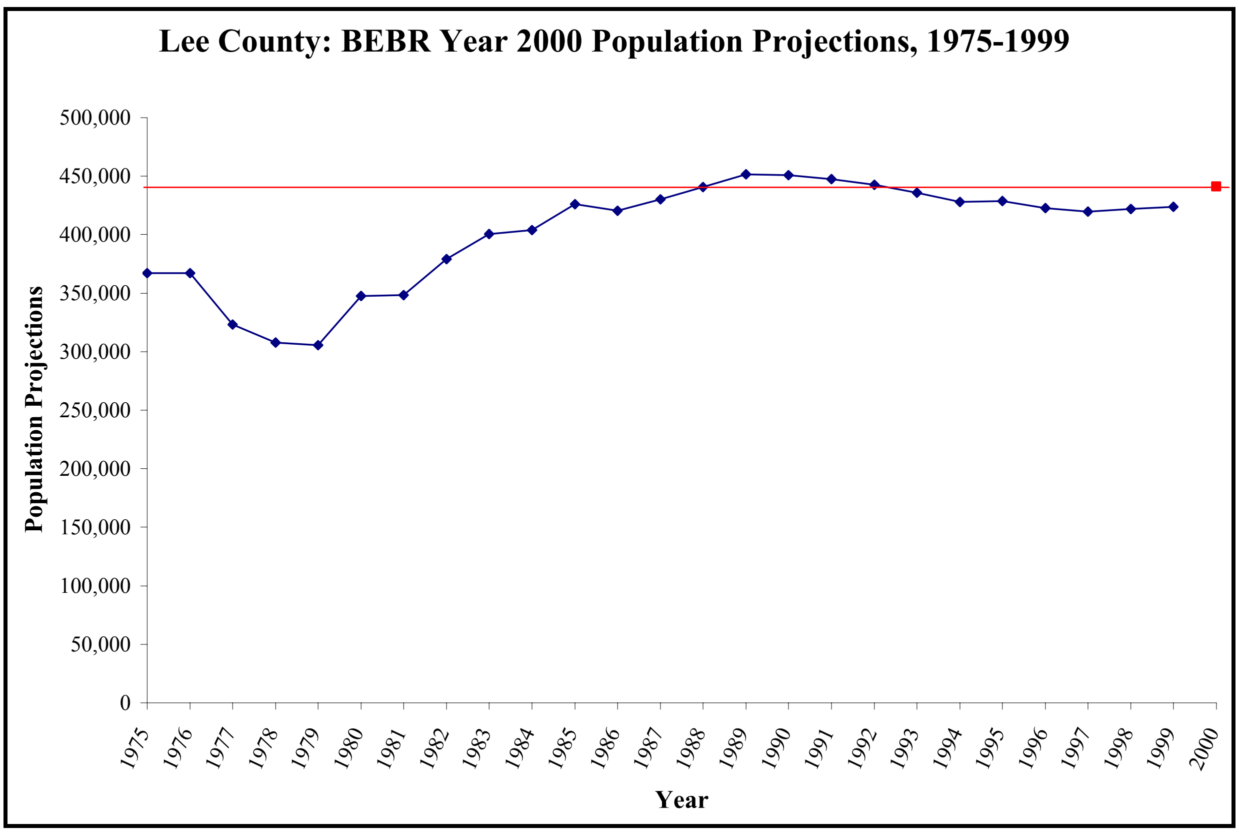

Indian River County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

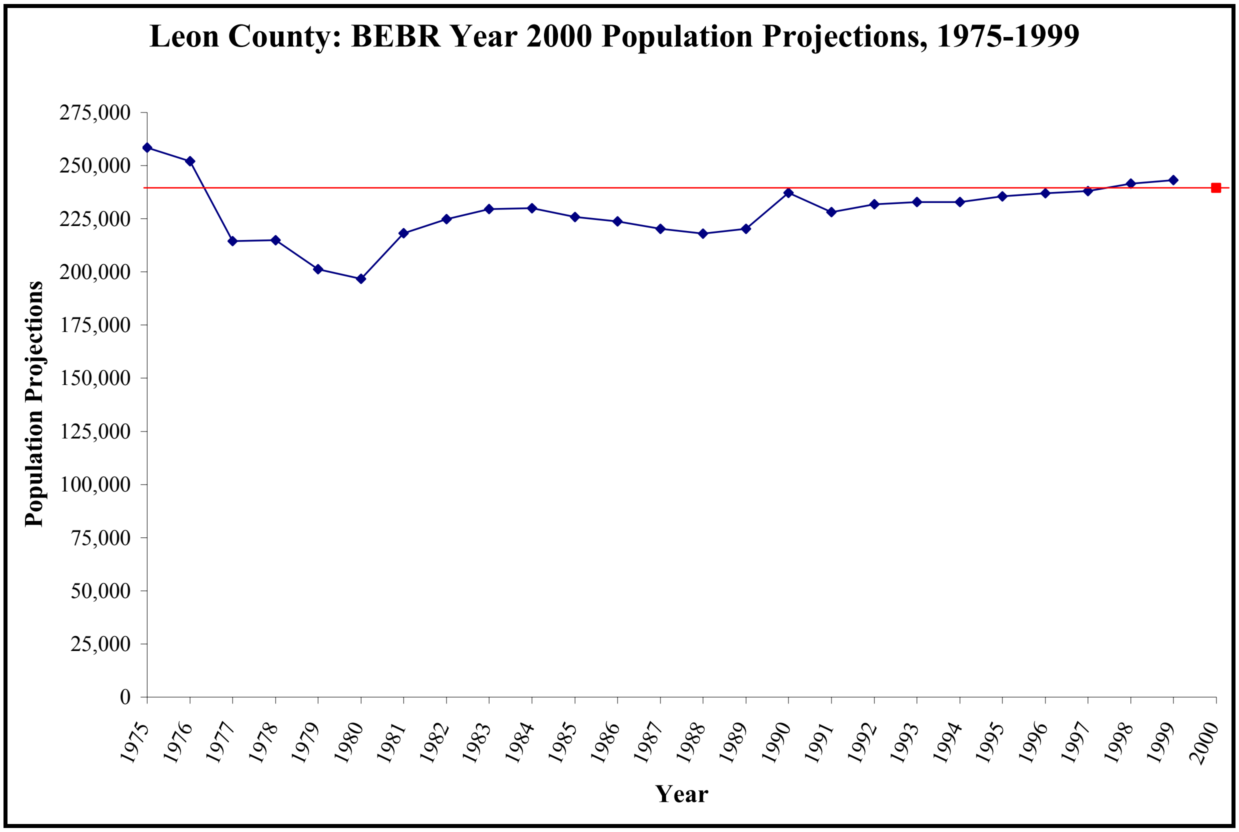

Jackson County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
67,500
60,000
52,500
45,000
37,500
30,000
22,500
15,000
7,500
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

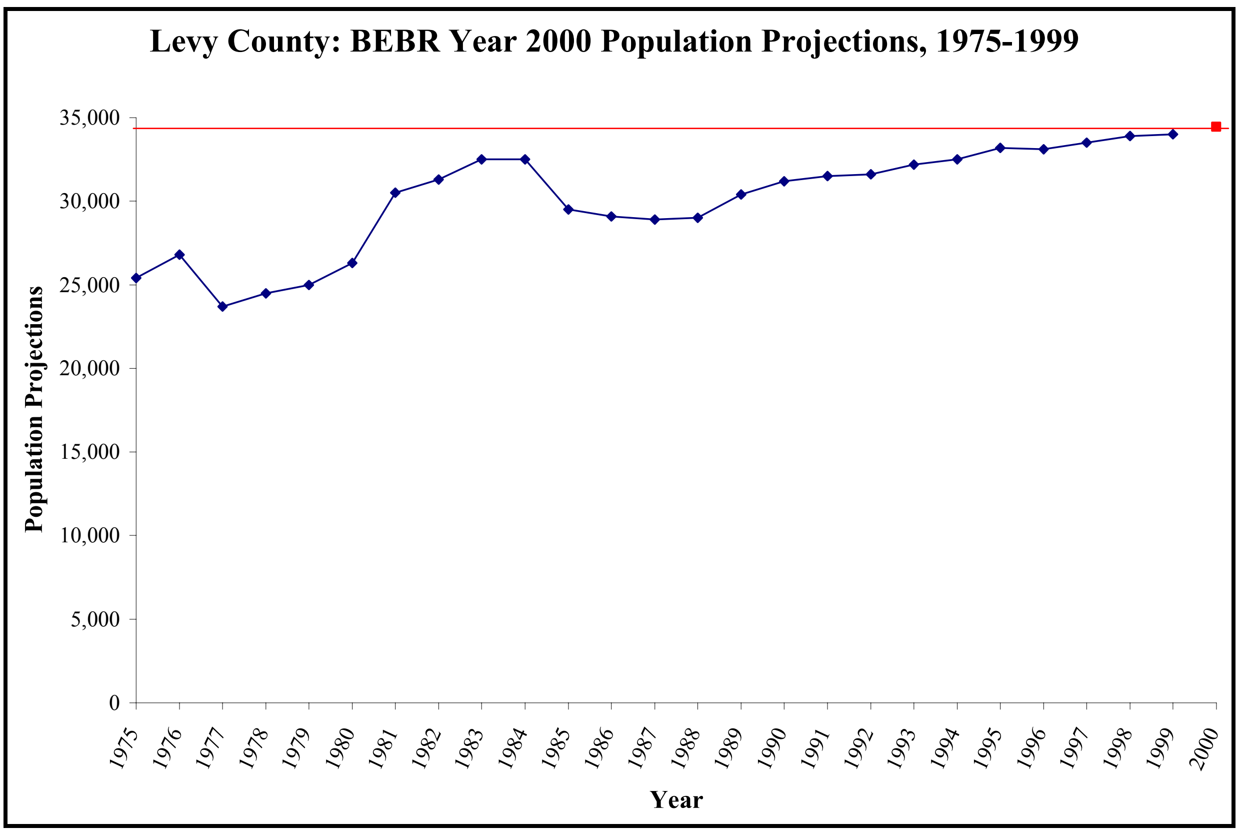

Jefferson County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

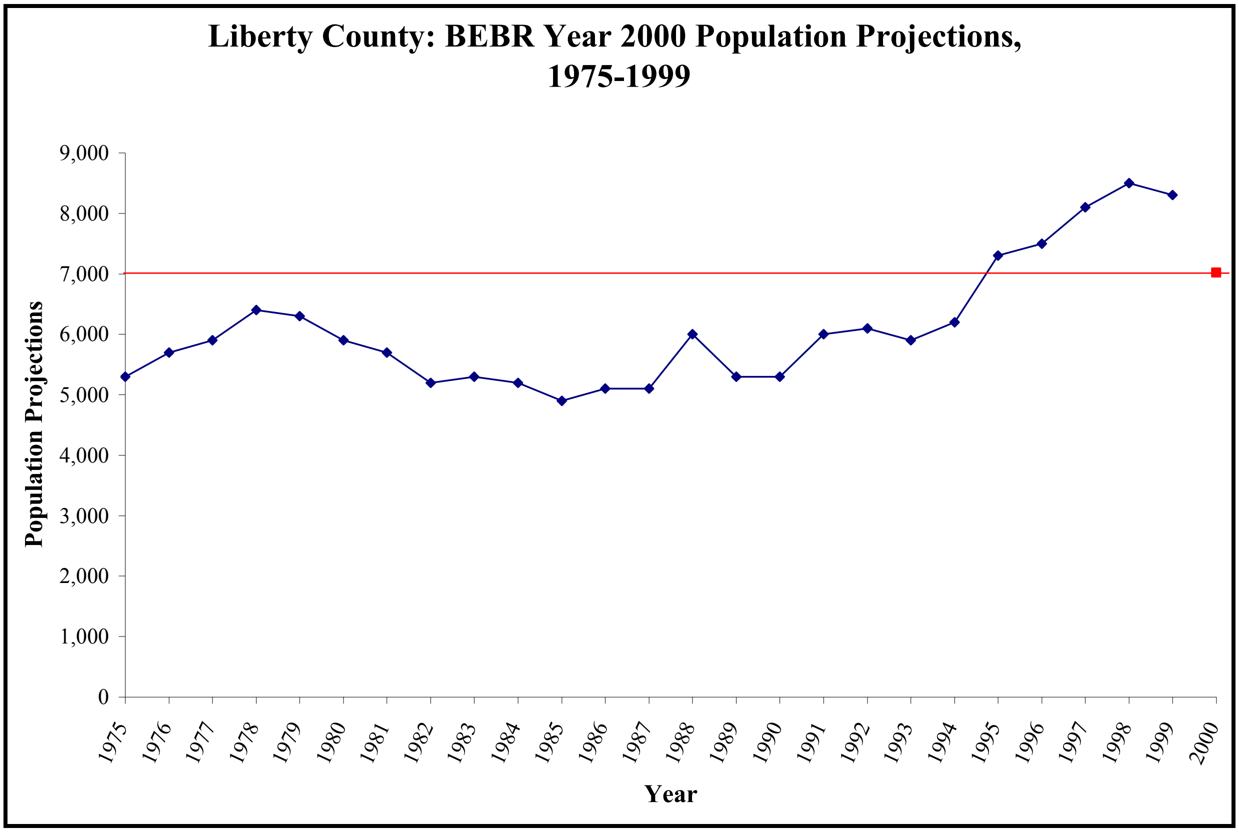

Lafayette County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

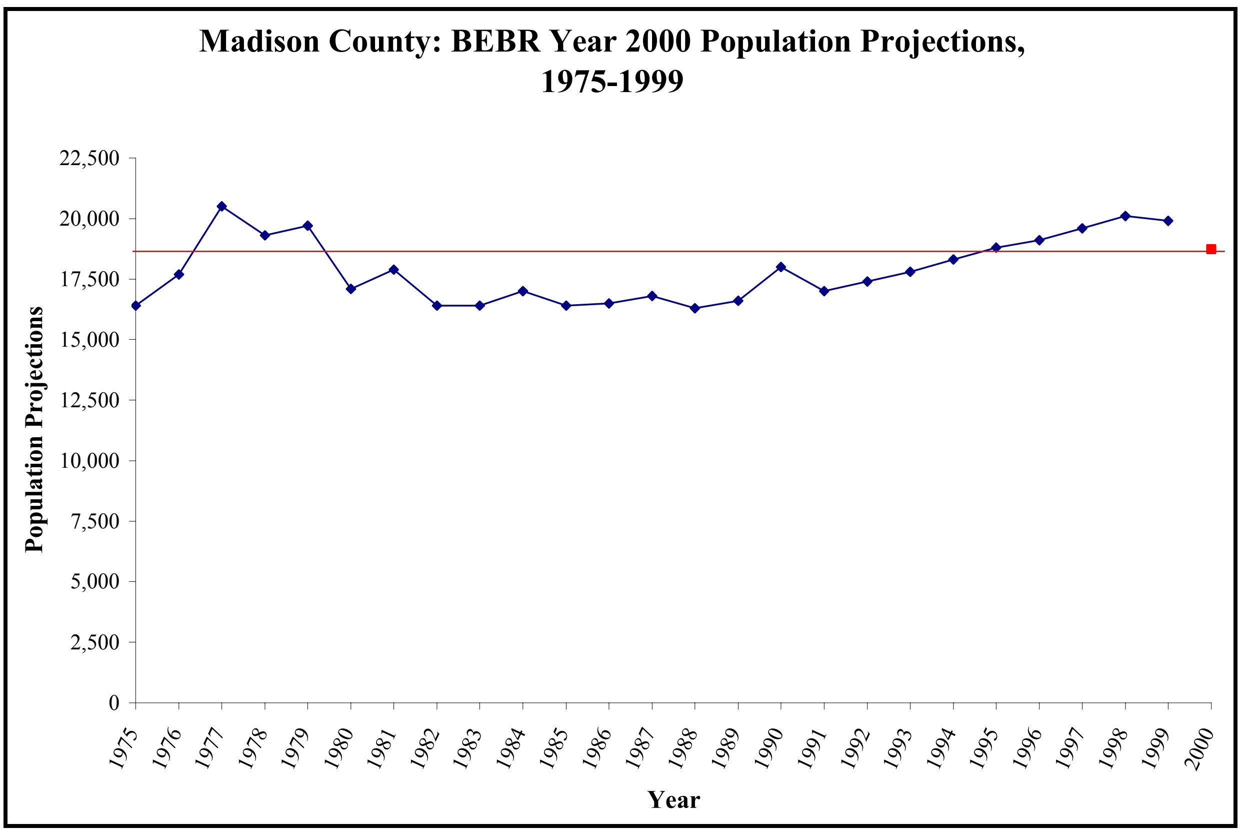

Lake County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
0
20,000
40,000
60,000
80,000
100,000
120,000
140,000
160,000
180,000
200,000
220,000
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year


Lee County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
0
50,000
100,000
150,000
200,000
250,000
300,000
350,000
400,000
450,000
500,000
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

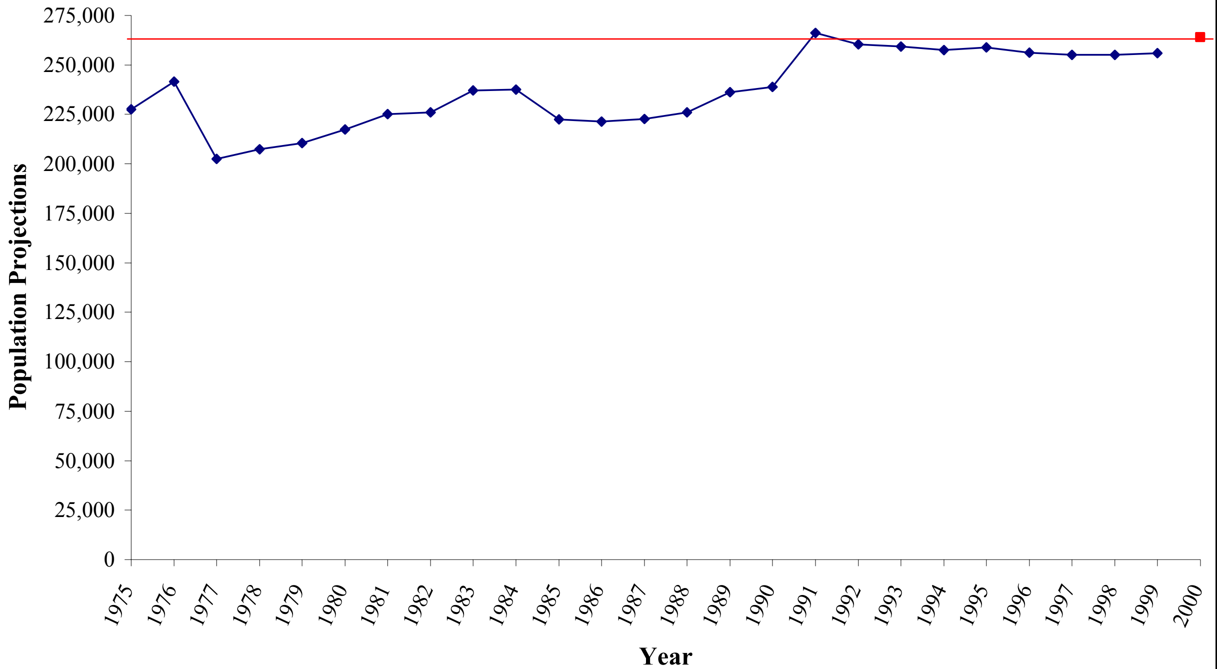

Leon County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
275,000
250,000
225,000
200,000
175,000
150,000
125,000
100,000
75,000
50,000
25,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year


Levy County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

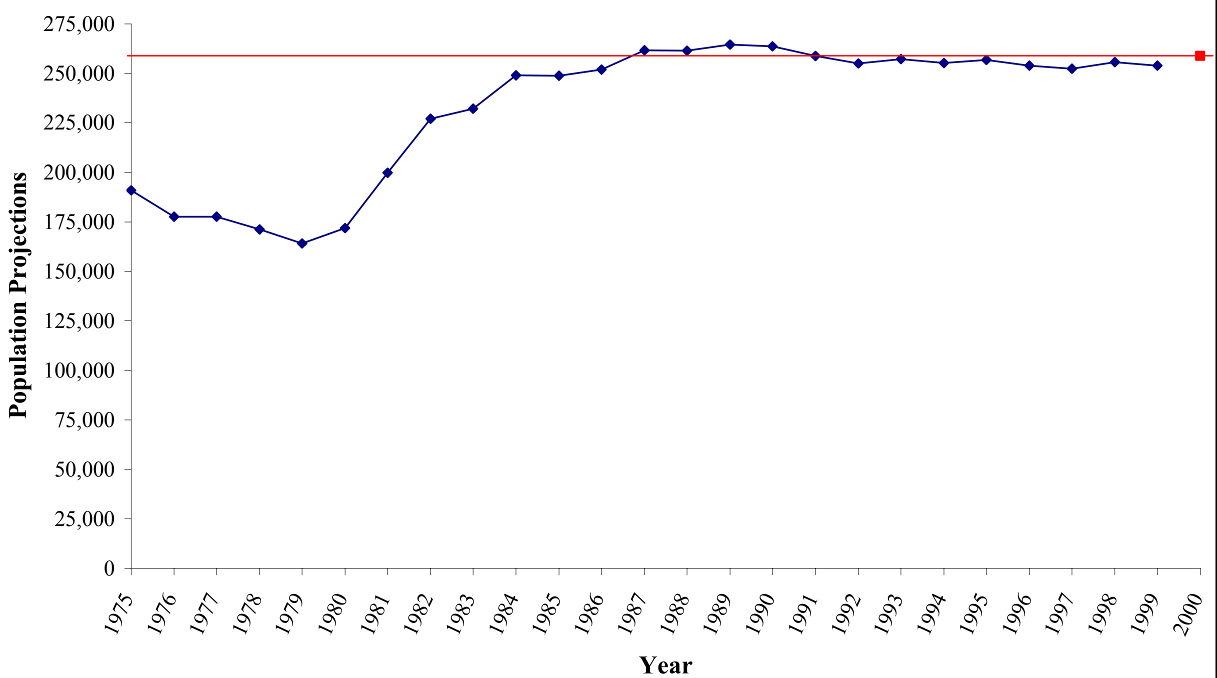

Liberty County: BEBR Year 2000 Population Projections,
1975-1999
Population Projections
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

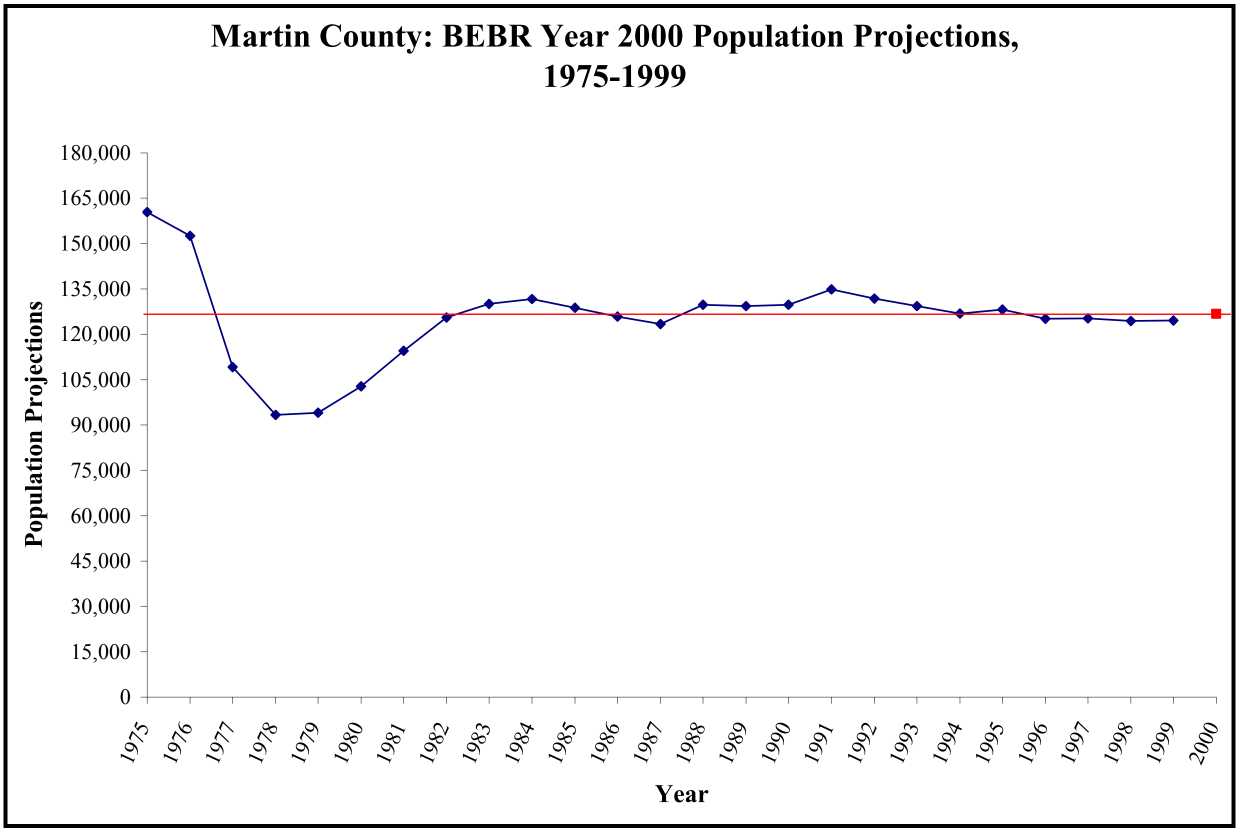

Madison County: BEBR Year 2000 Population Projections,
1975-1999
Population Projections
22,500
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

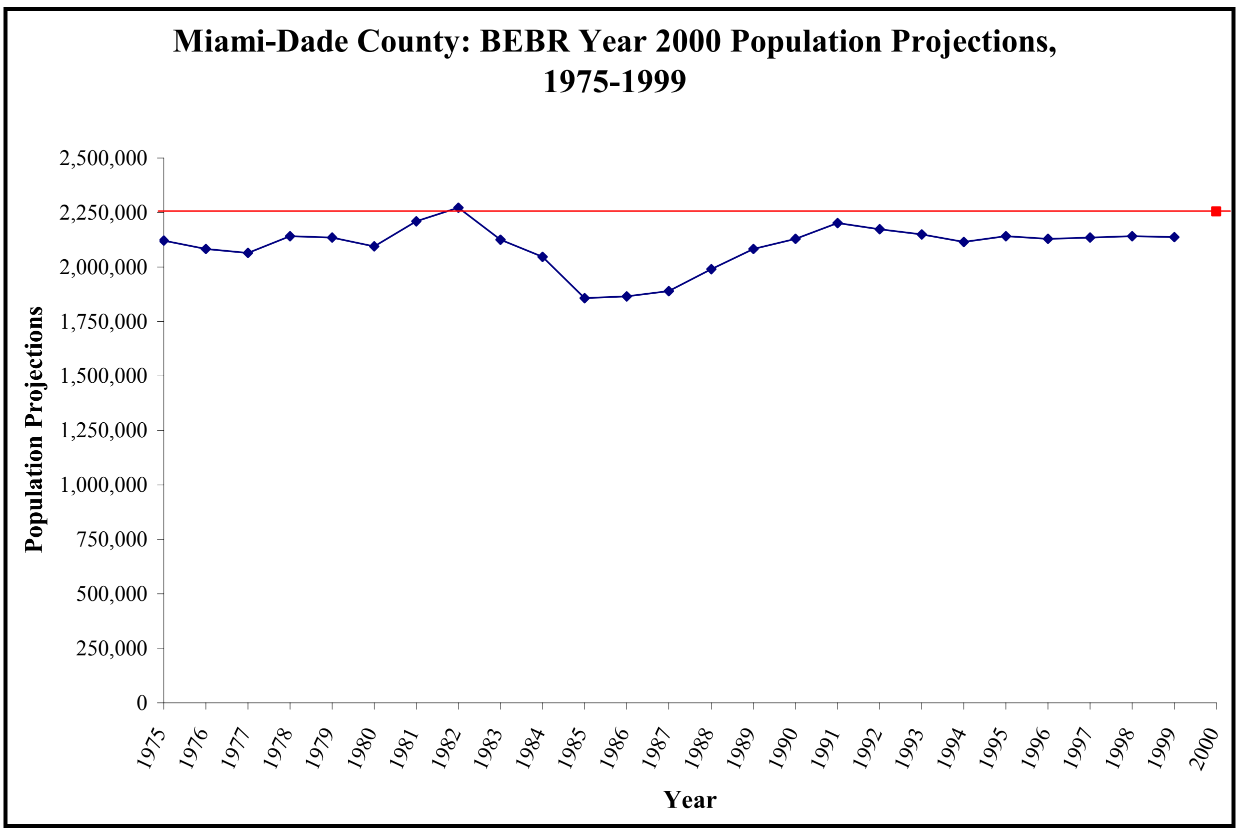
Manatee County: BEBR Year 2000 Population Projections, 1975-1999

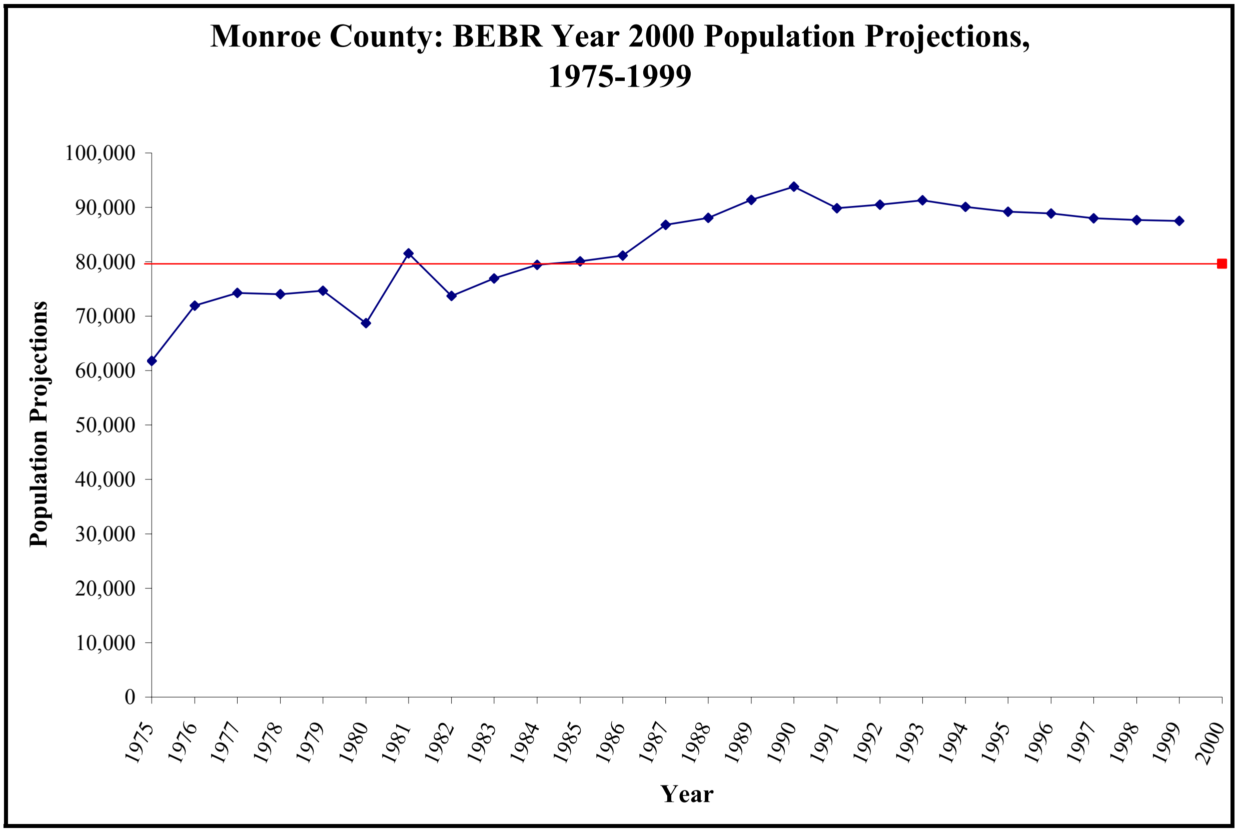


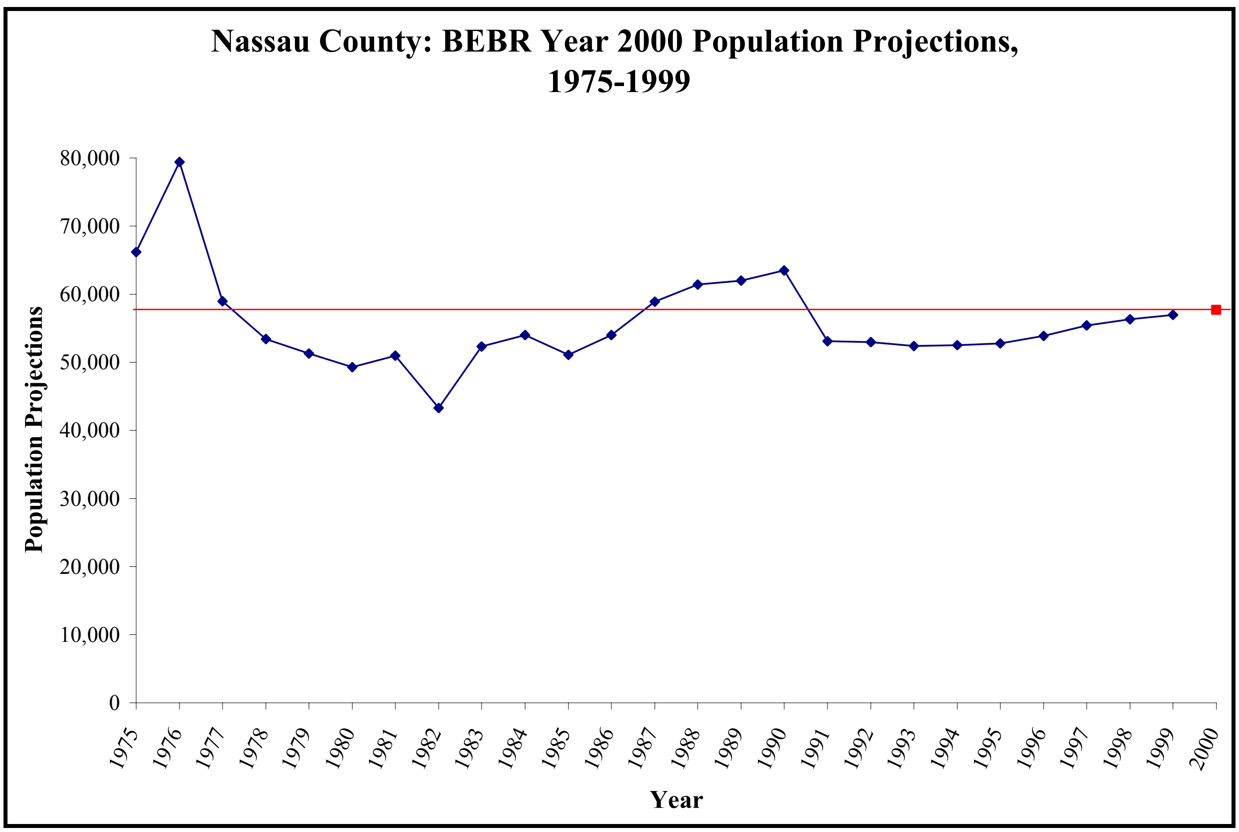
Marion County: BEBR Year 2000 Population Projections, 1975-1999

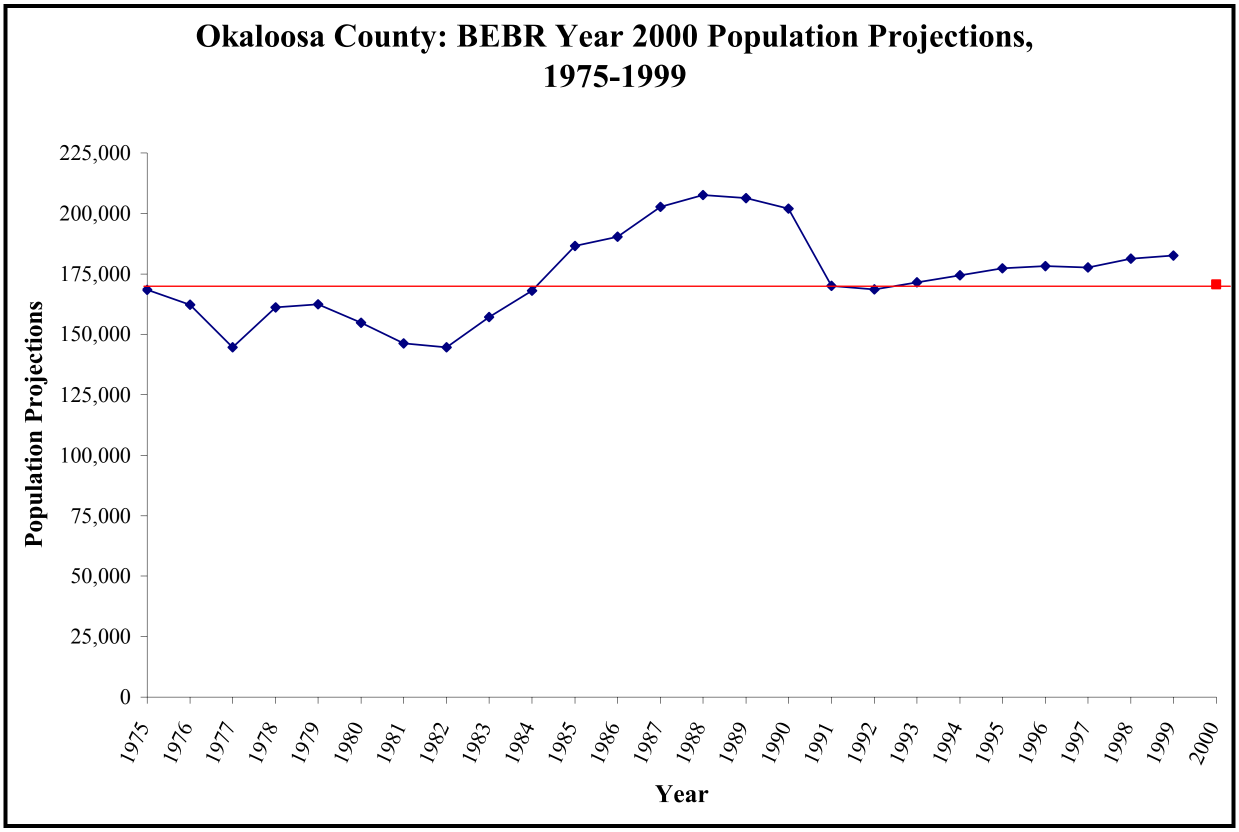


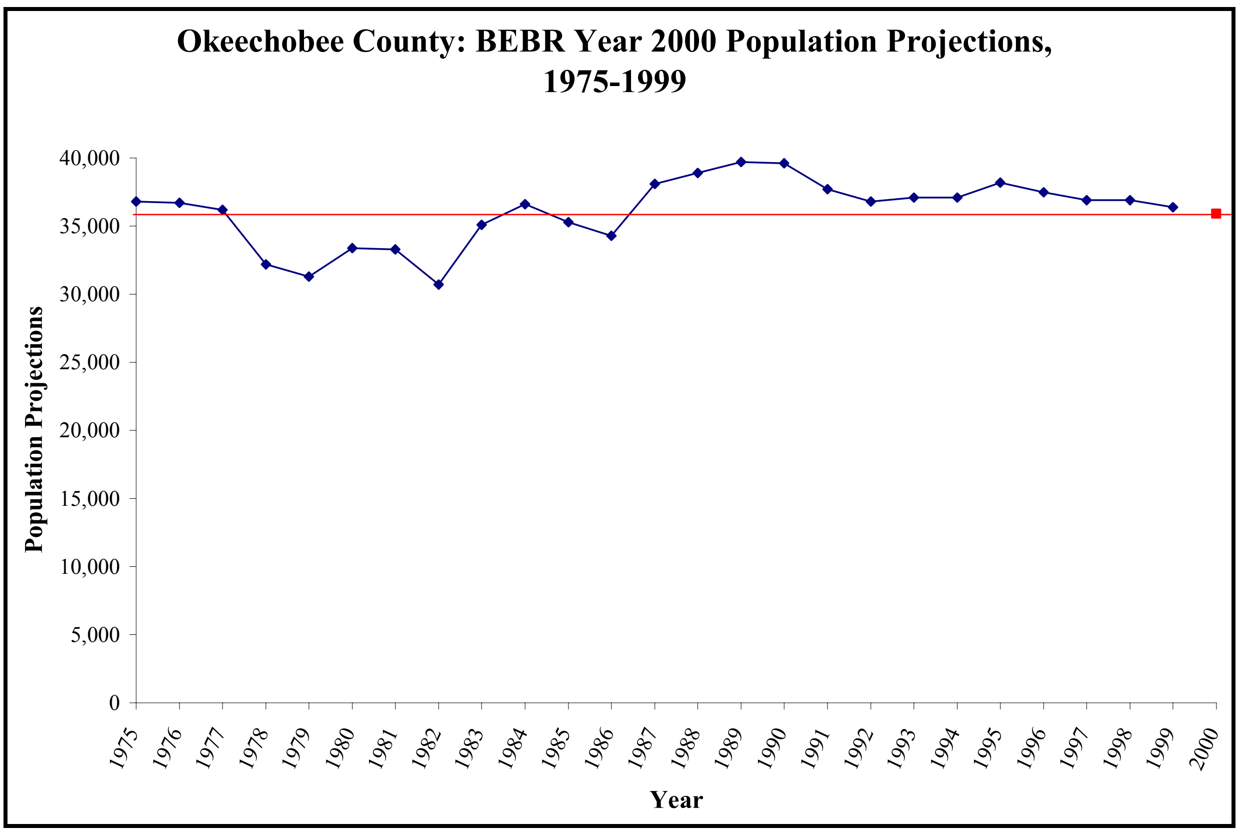

Martin County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
180,000
165,000
150,000
135,000
120,000
105,000
90,000
75,000
60,000
45,000
30,000
15,000
0
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

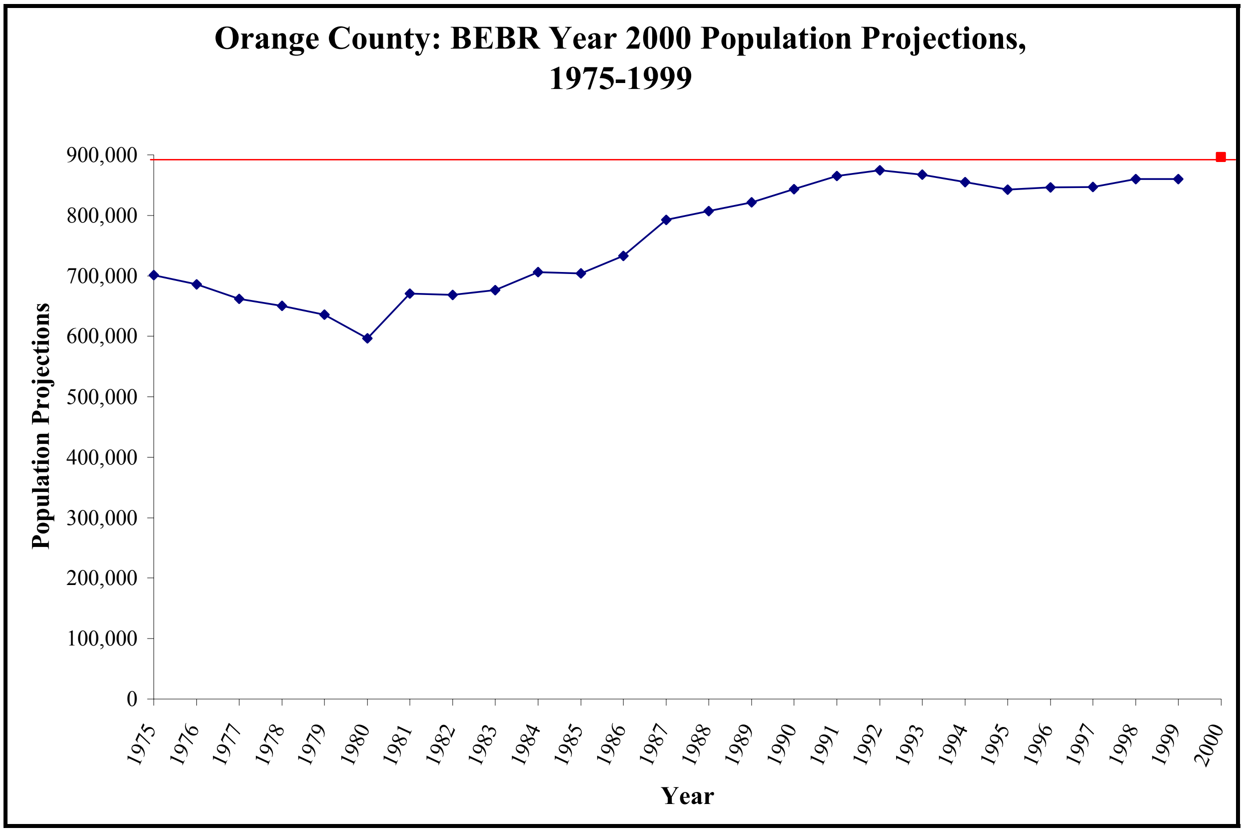

Miami-Dade County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
2,500,000
2,250,000
2,000,000
1,750,000
1,500,000
1,250,000
1,000,000
750,000
500,000
250,000
0
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

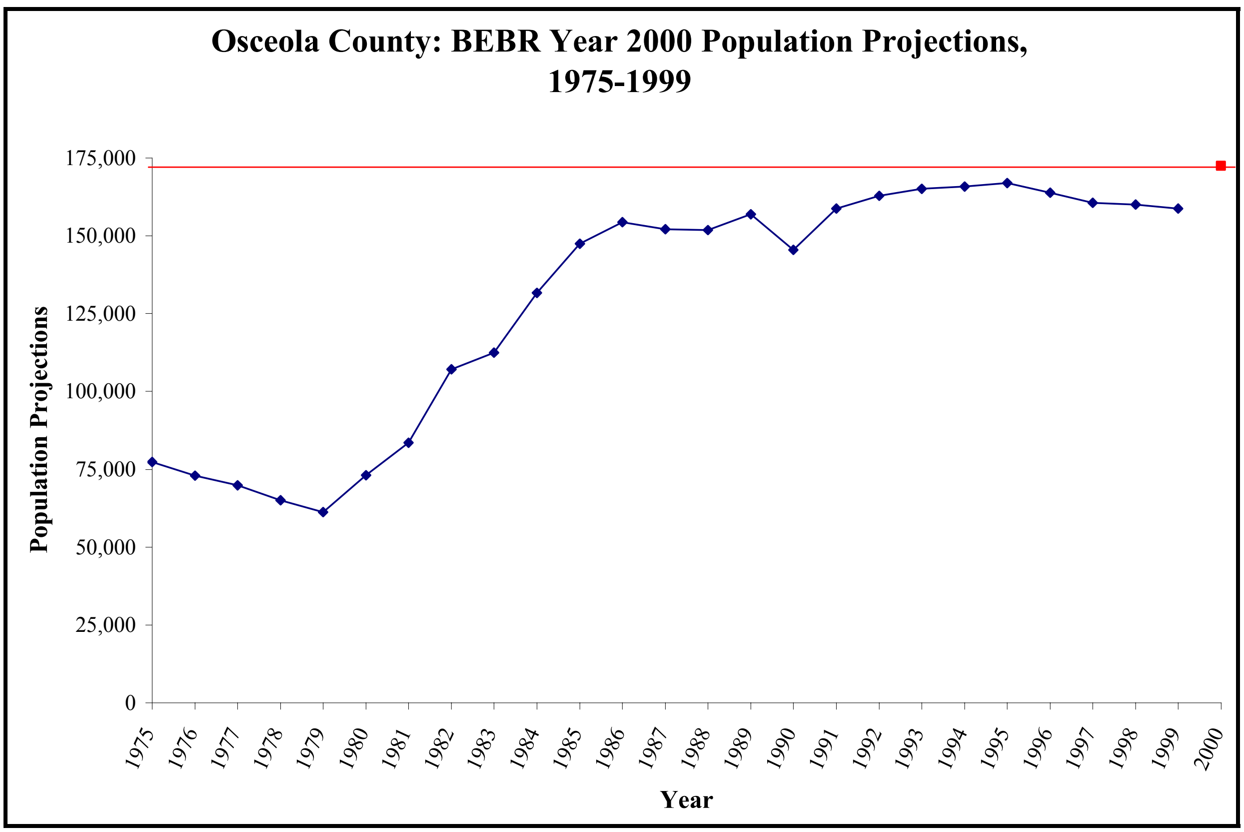

Monroe County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

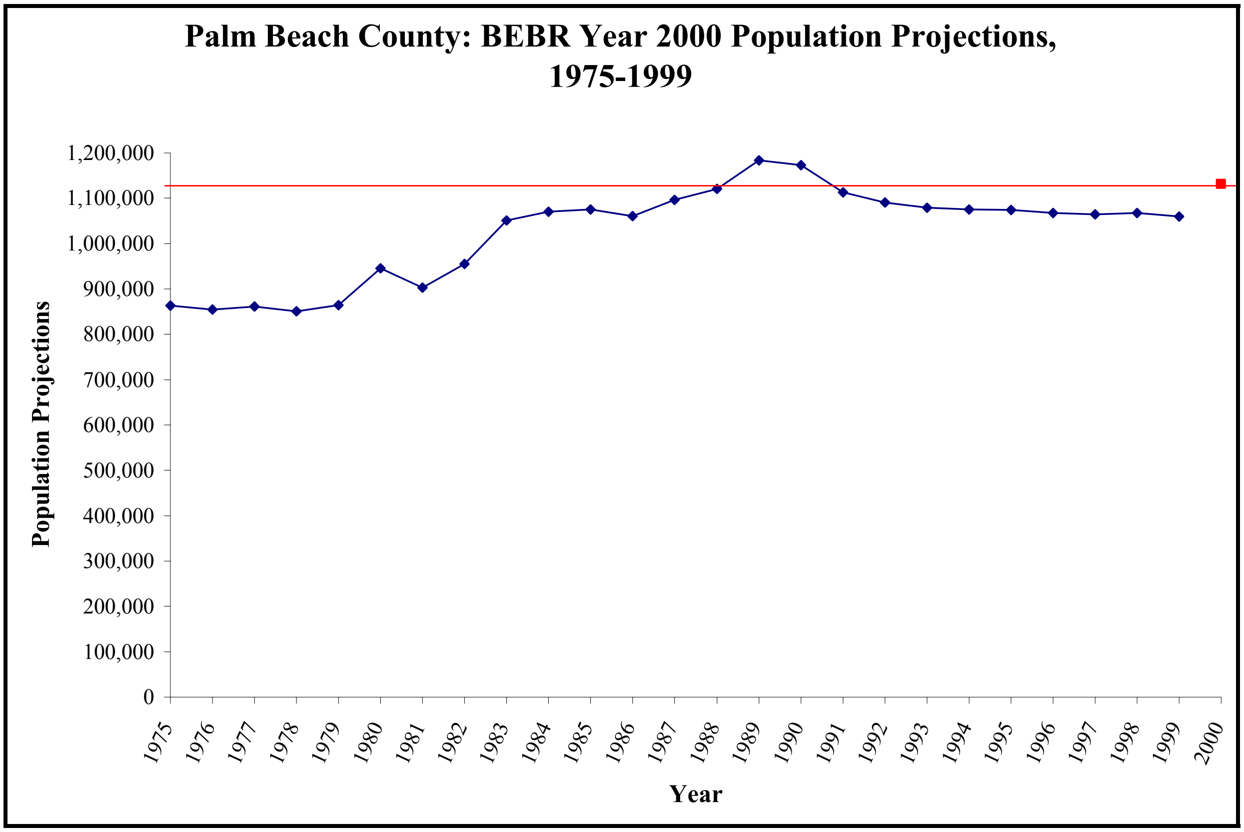

Nassau County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

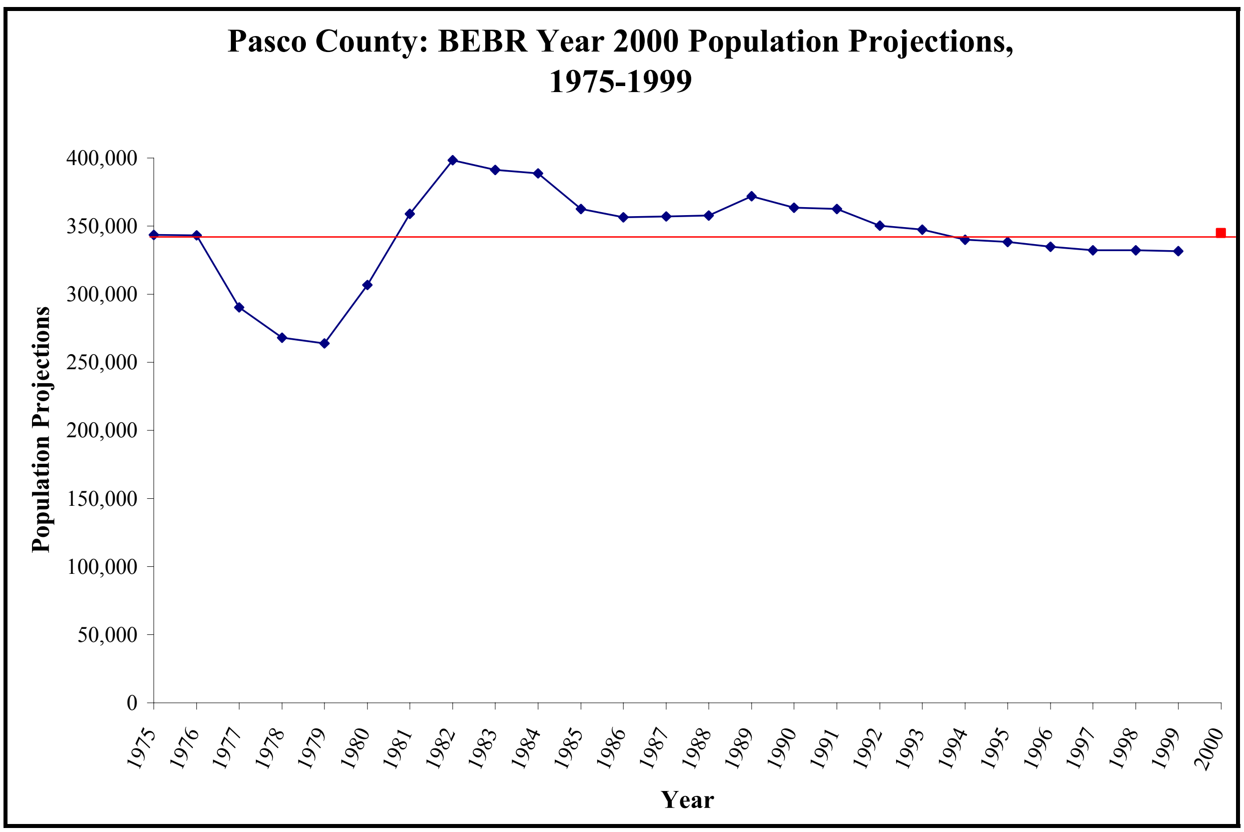

Okaloosa County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
225,000
200,000
175,000
150,000
125,000
100,000
75,000
50,000
25,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

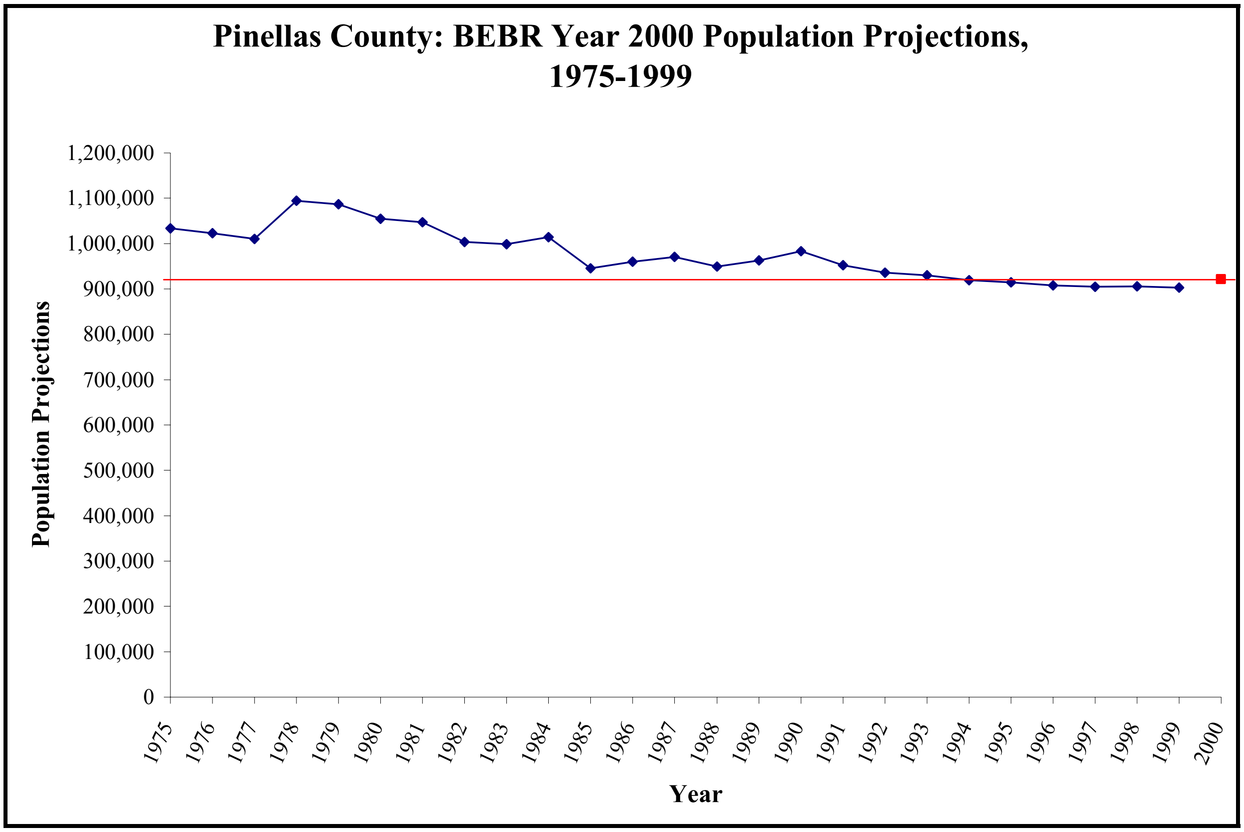

Okeechobee County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

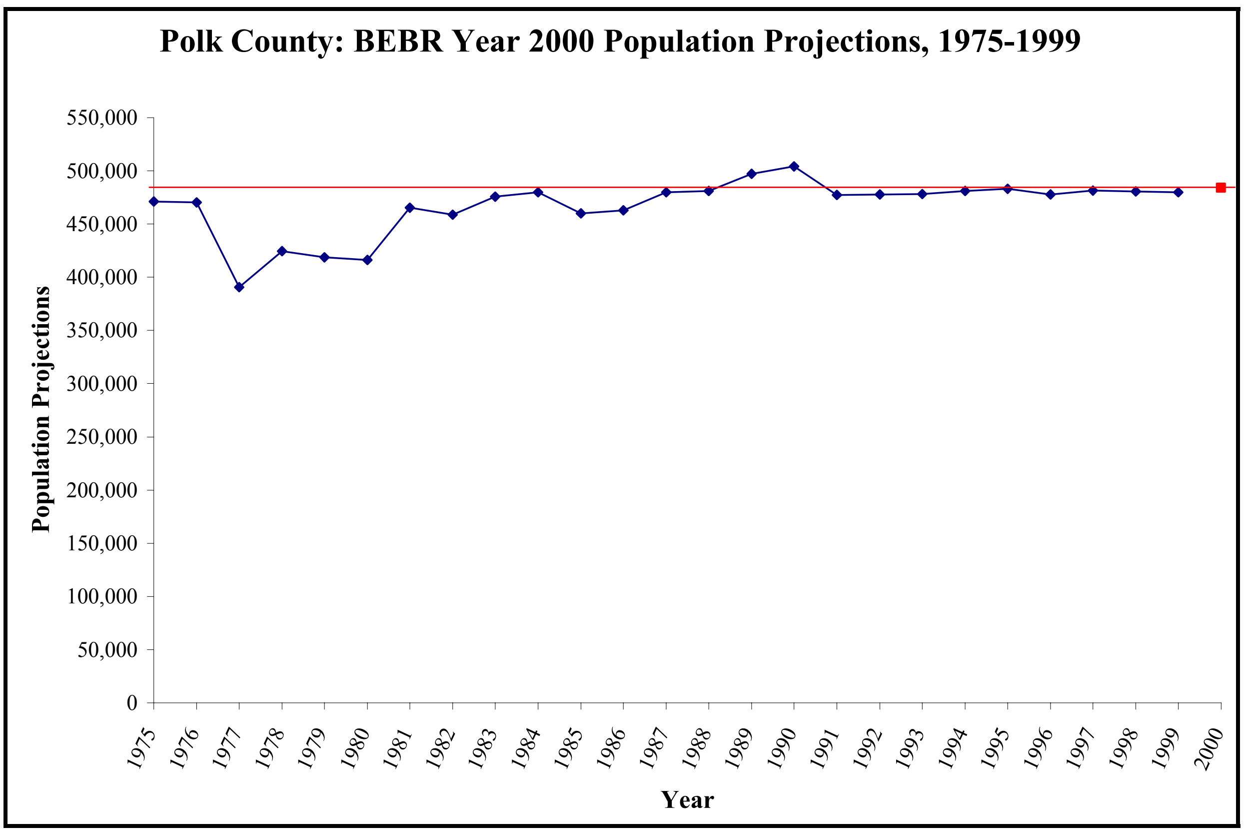

Orange County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
0
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

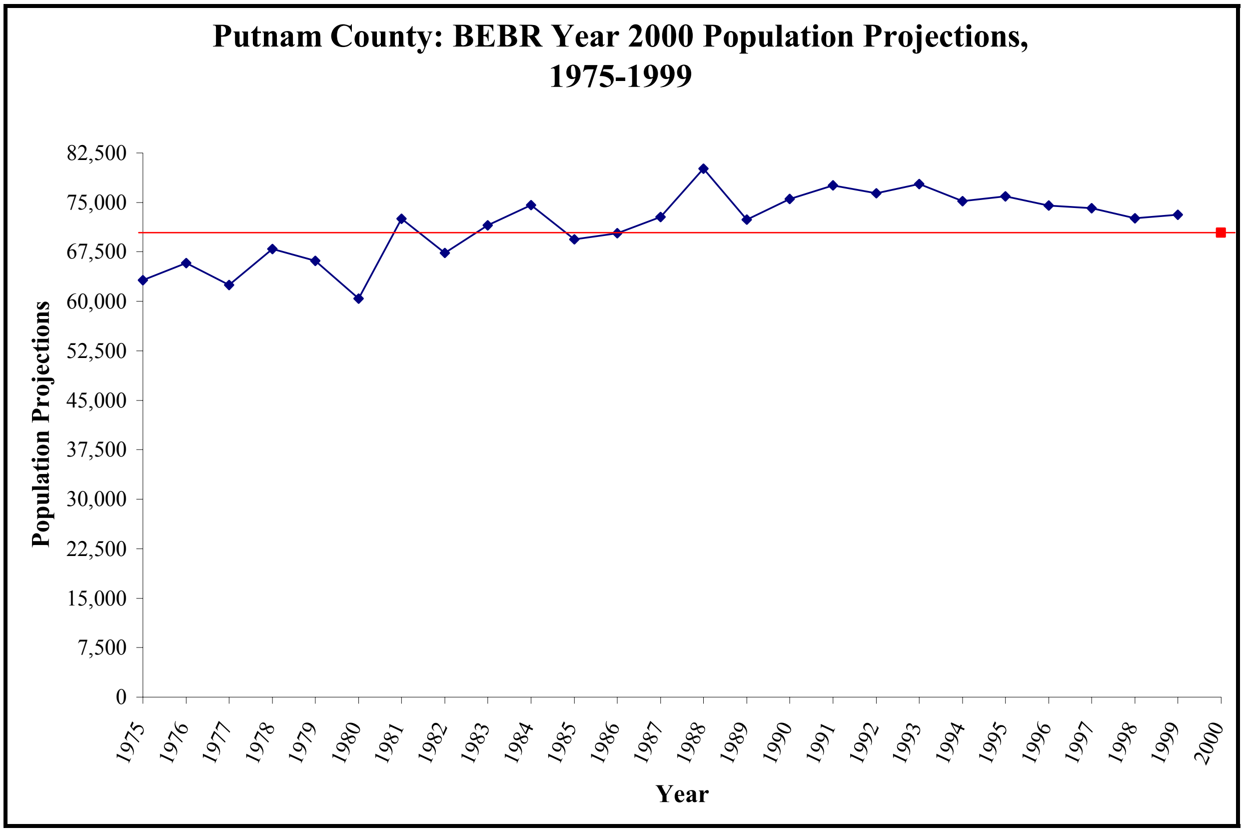

Osceola County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
0
25,000
50,000
75,000
100,000
125,000
150,000
175,000
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

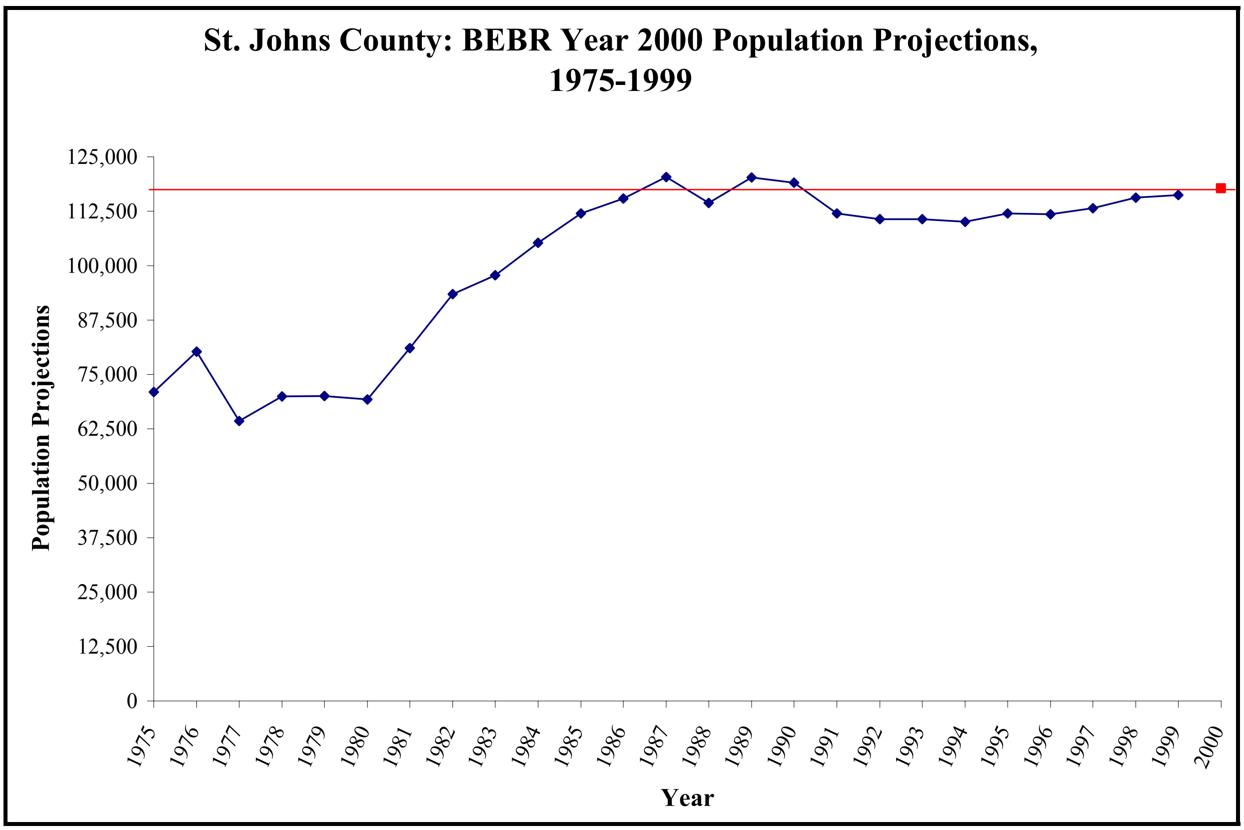

Palm Beach County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

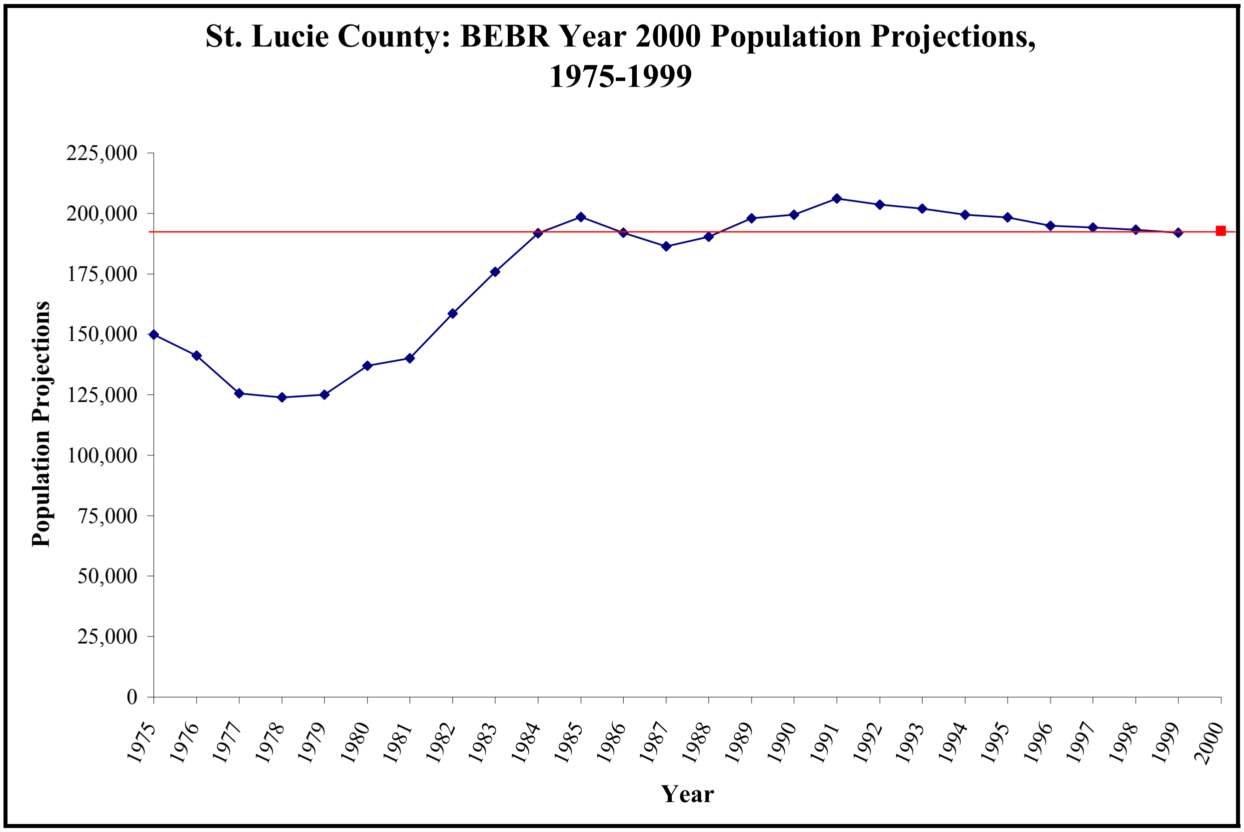

Pasco County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

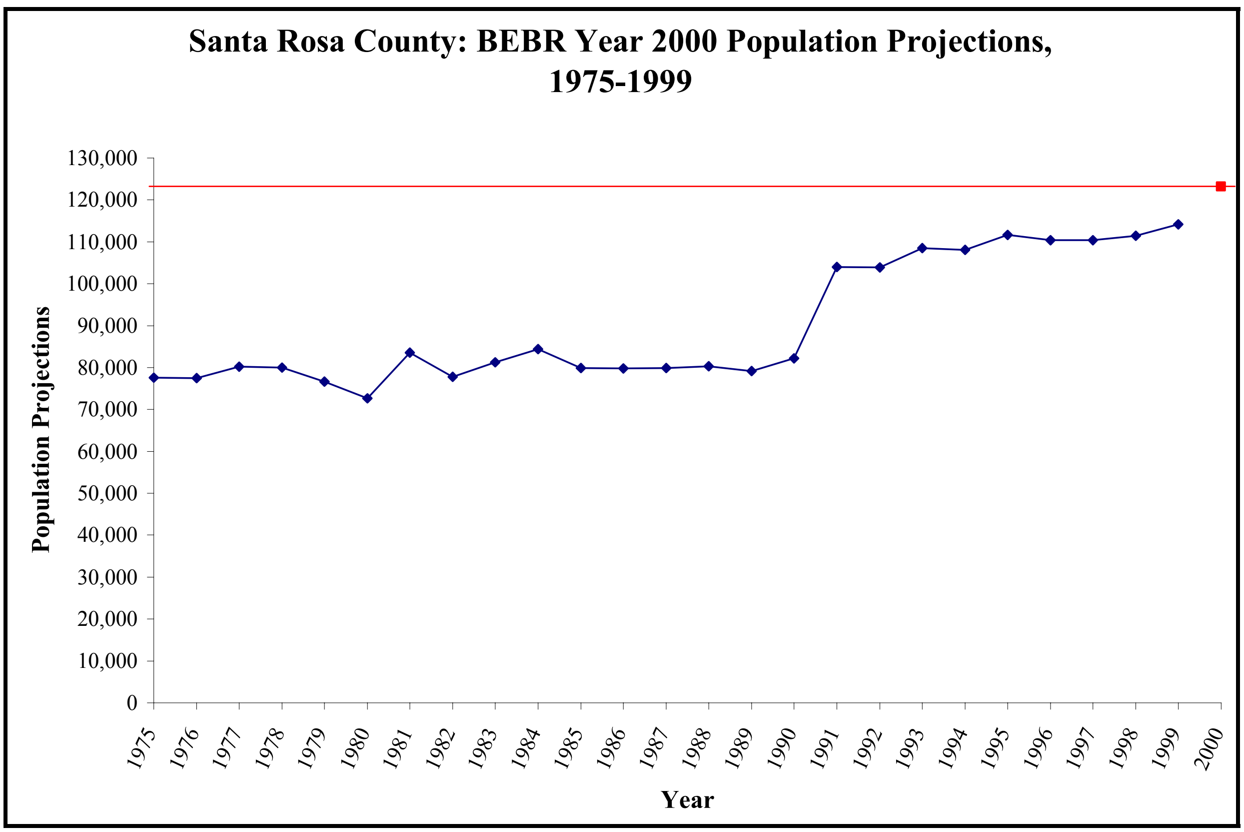

Pinellas County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000


Polk County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

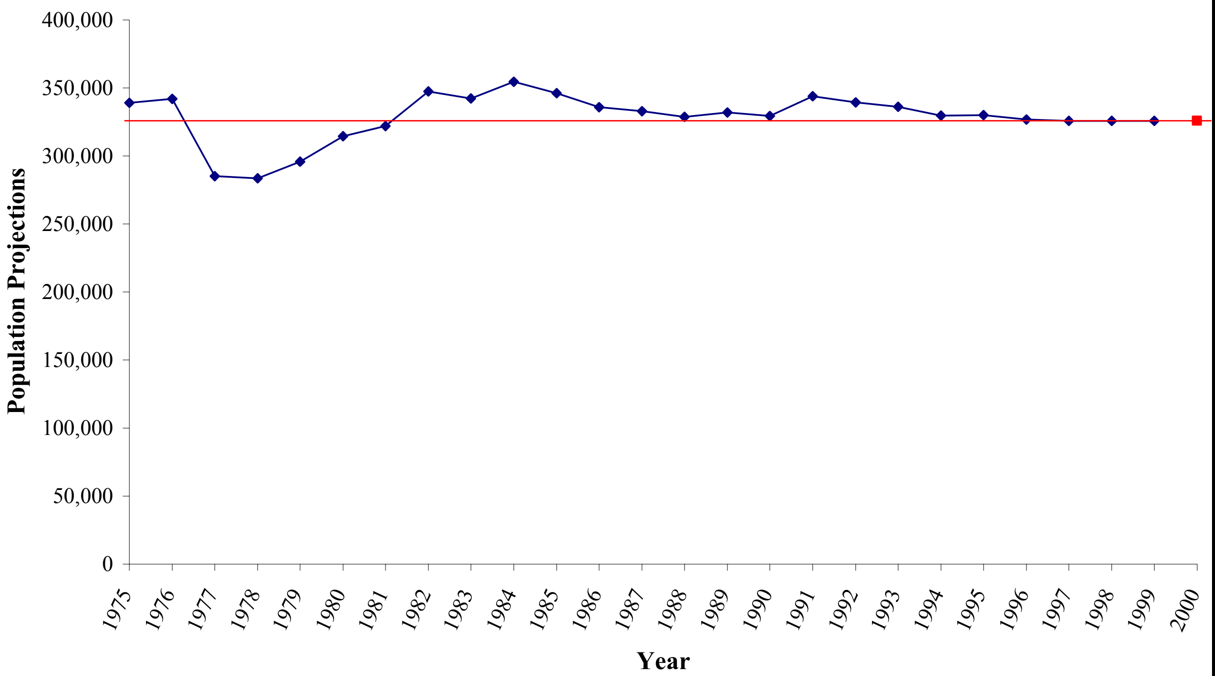

Putnam County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
82,500
75,000
67,500
60,000
52,500
45,000
37,500
30,000
22,500
15,000
7,500
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year


St. Johns County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
125,000
112,500
100,000
87,500
75,000
62,500
50,000
37,500
25,000
12,500
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

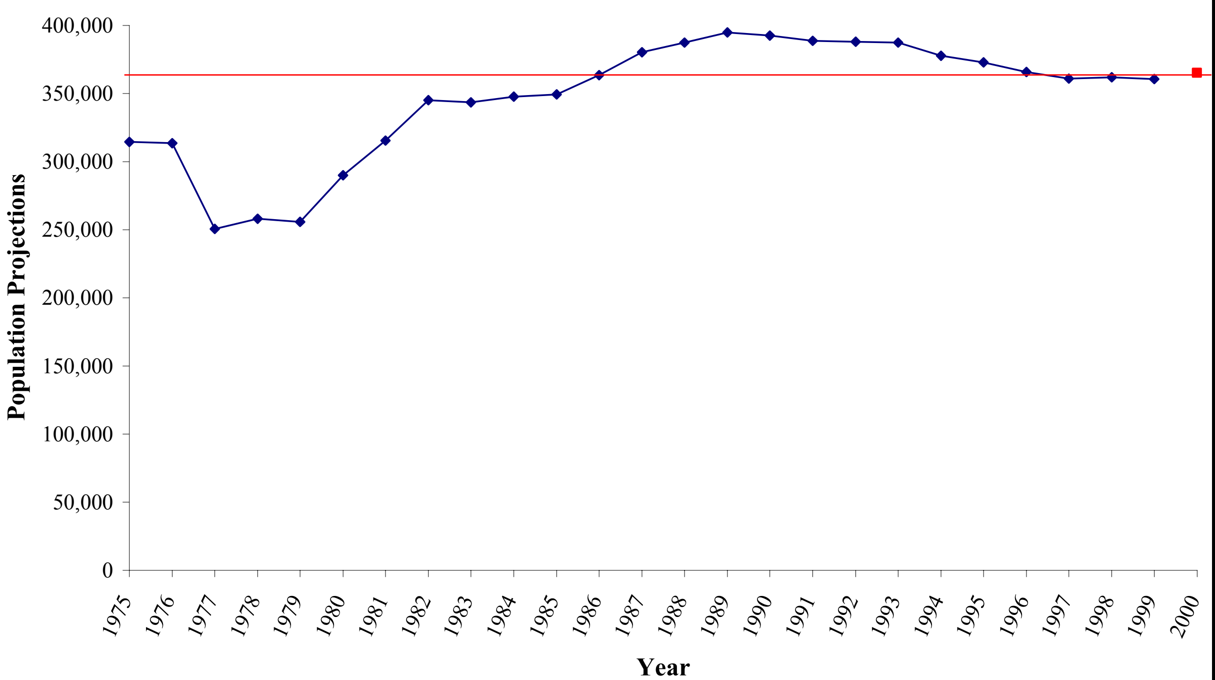

St. Lucie County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
225,000
200,000
175,000
150,000
125,000
100,000
75,000
50,000
25,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

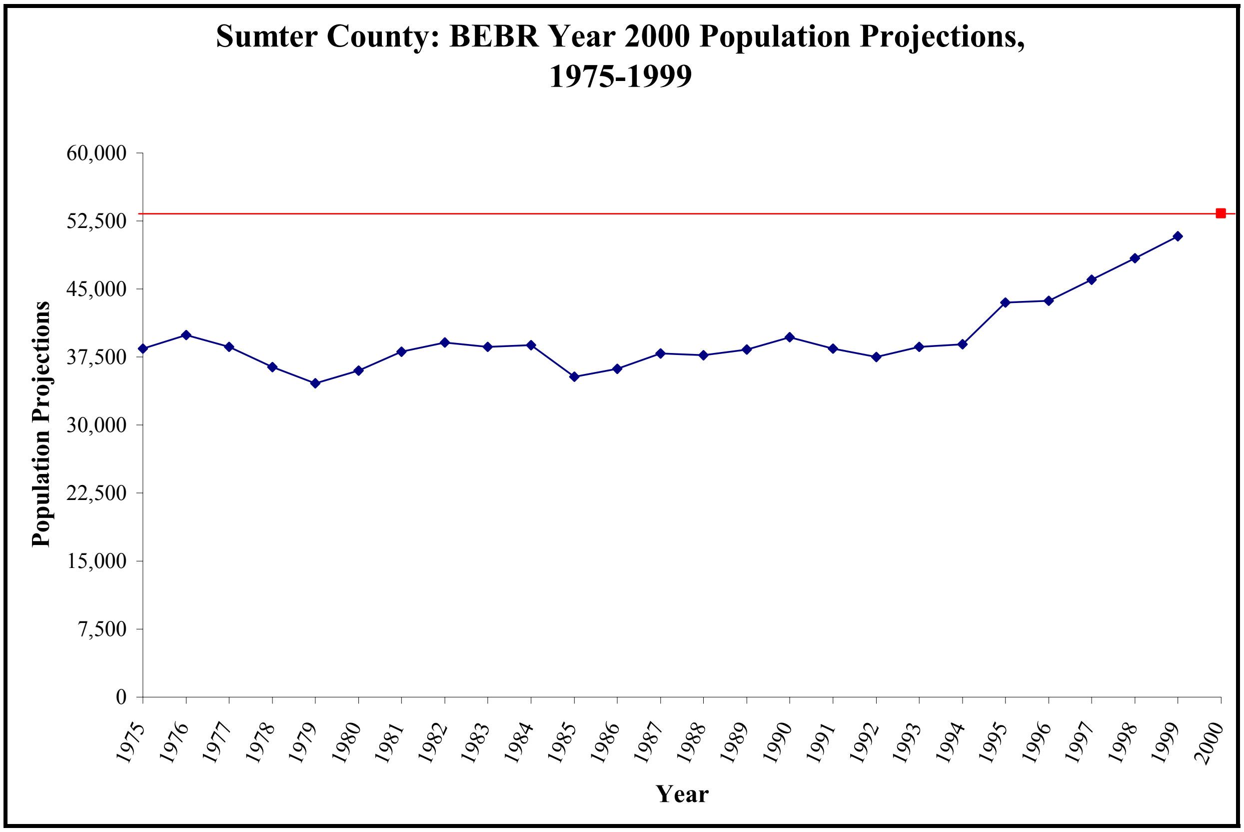

Santa Rosa County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

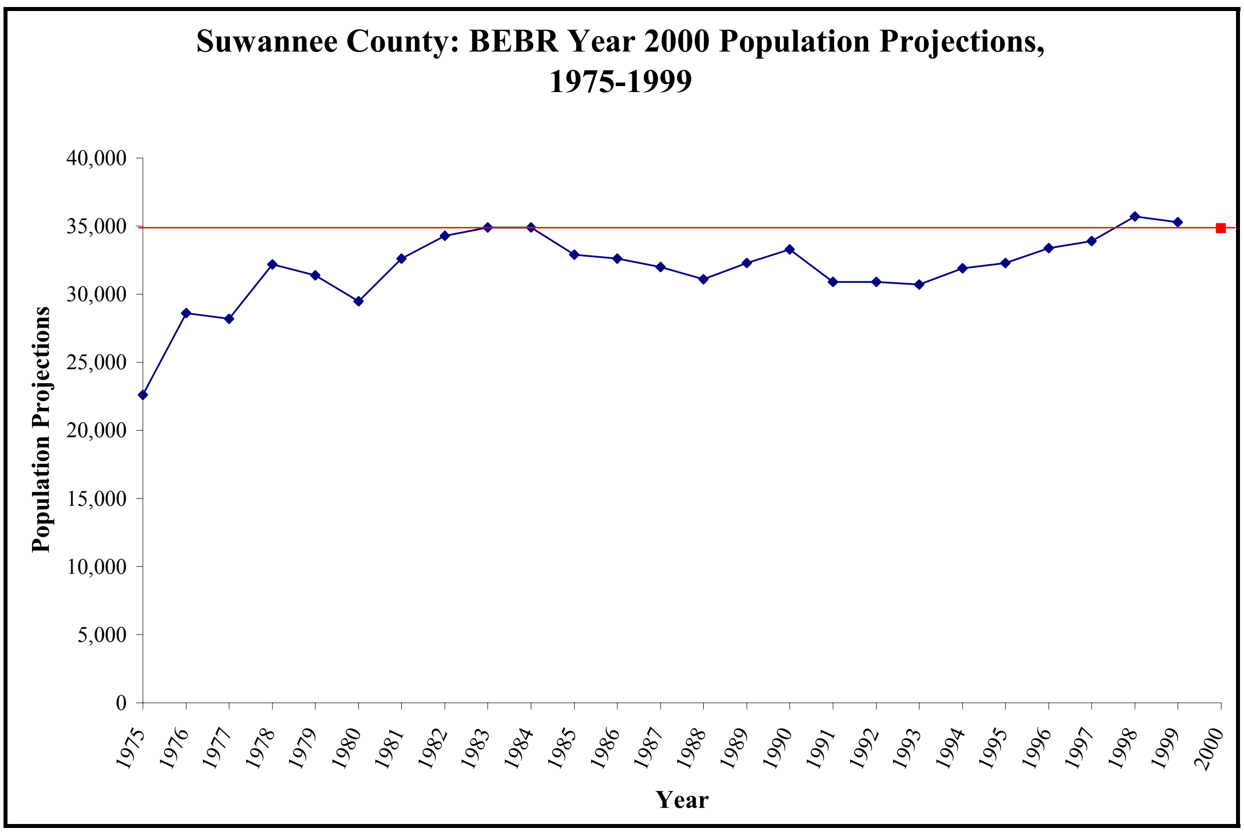
Sarasota County: BEBR Year 2000 Population Projections, 1975-1999

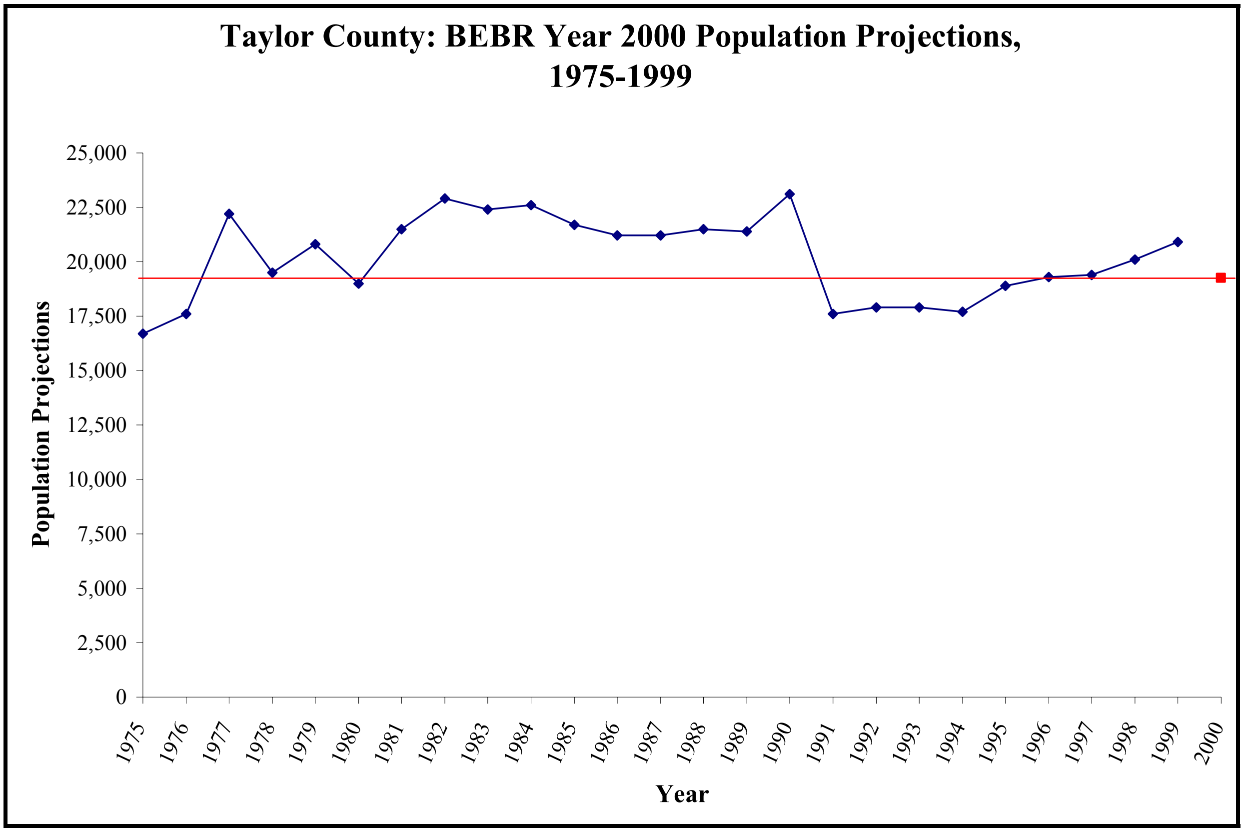


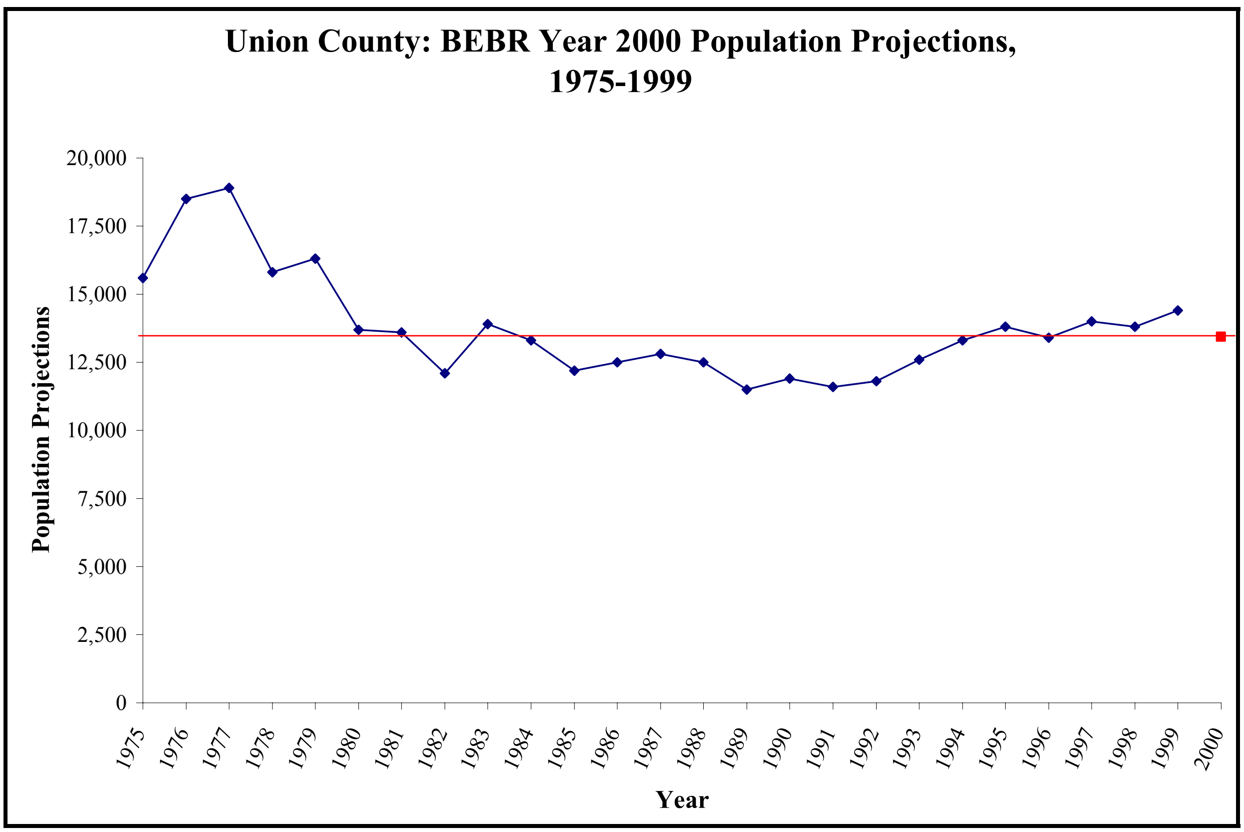
Seminole County: BEBR Year 2000 Population Projections, 1975-1999

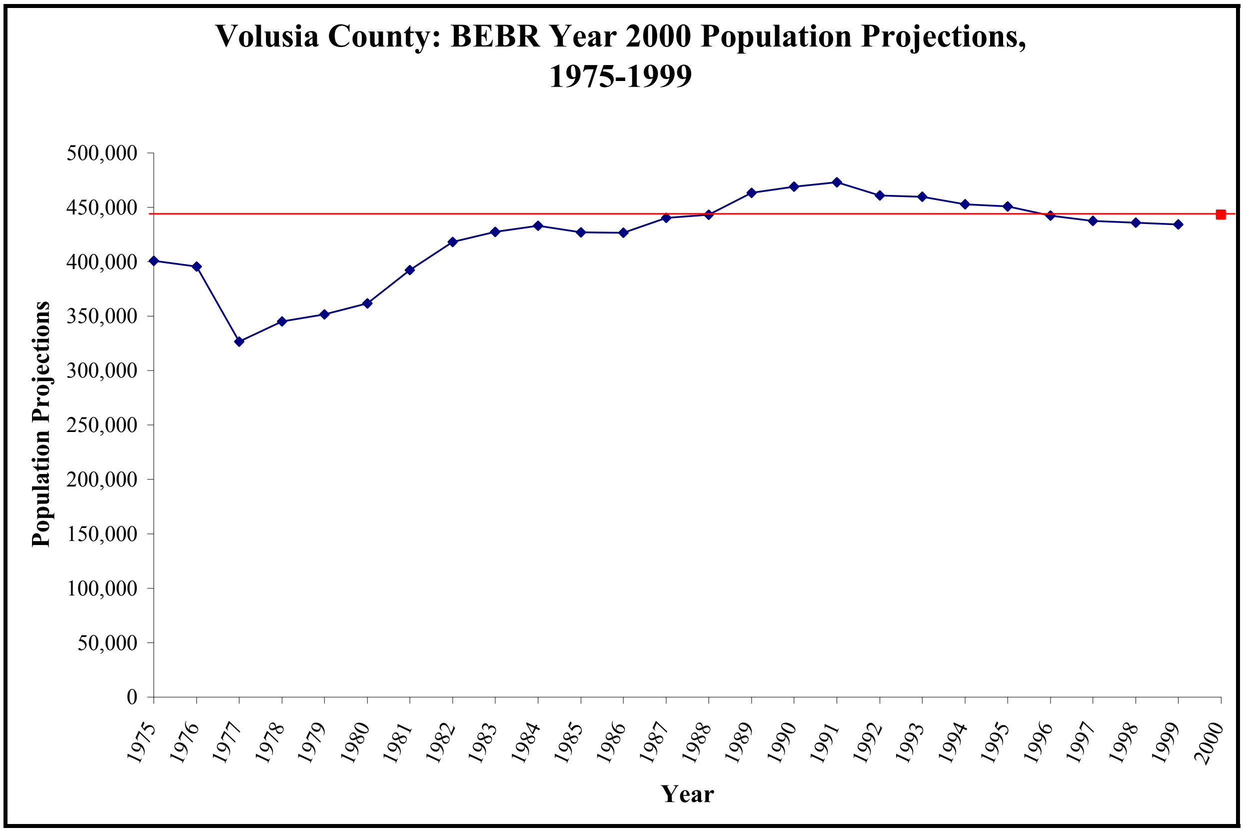


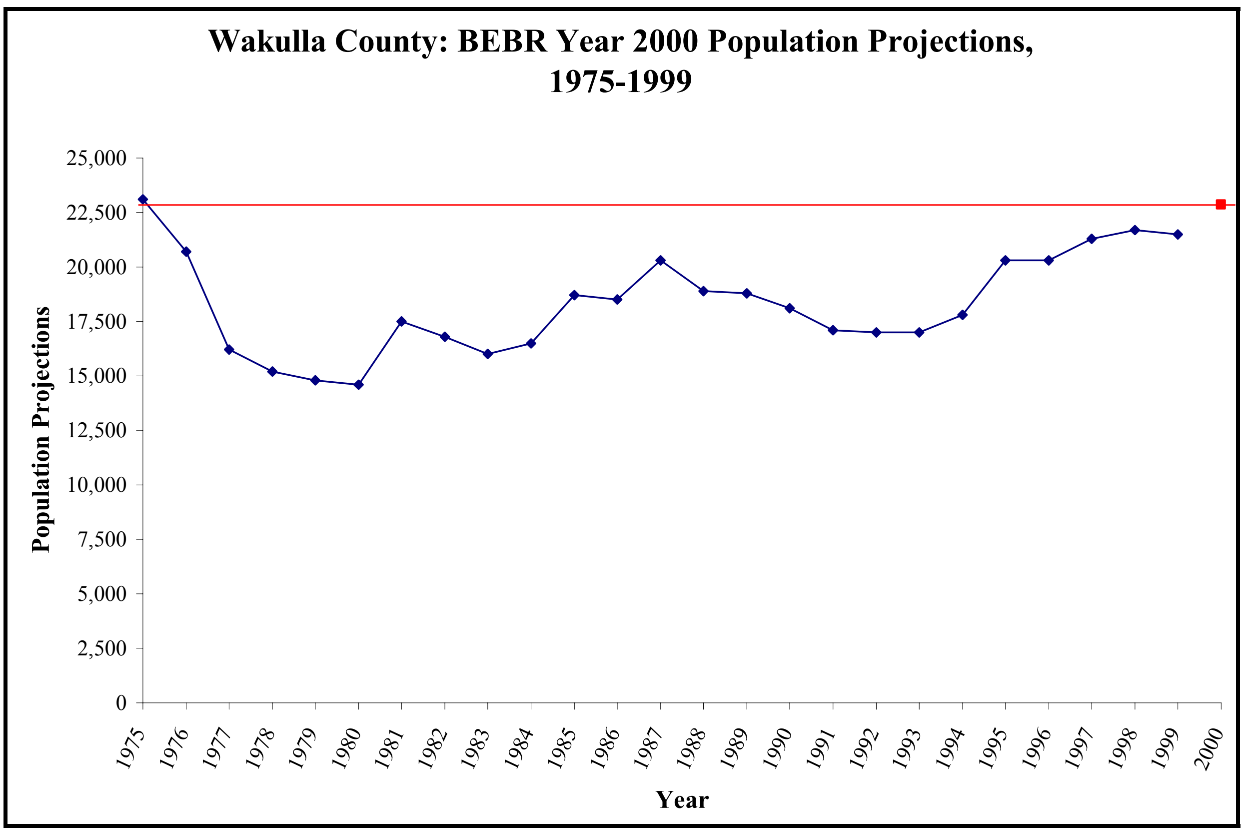

Sumter County: BEBR Year 2000 Population Projections, 1975-1999
60,000
52,500
45,000
37,500
30,000
22,500
15,000
7,500
0
Population Projections
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

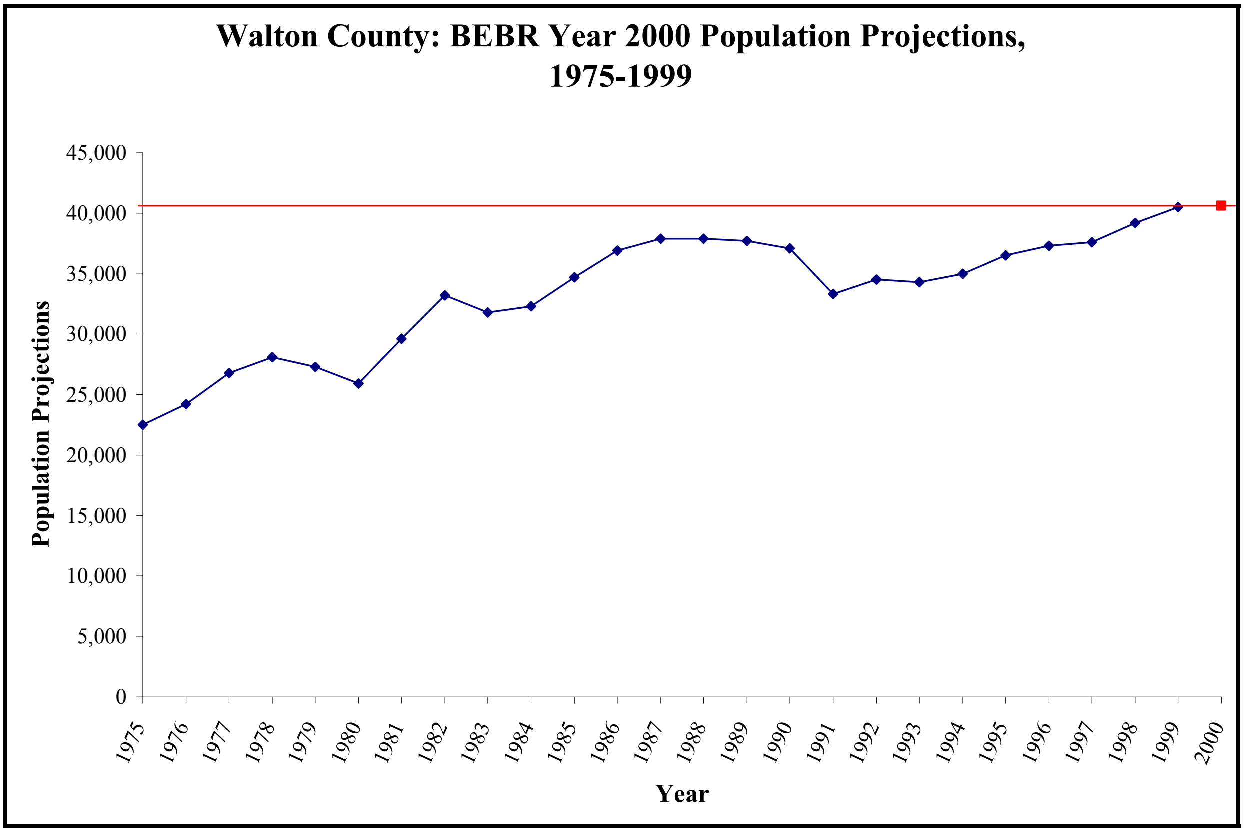

Suwannee County: BEBR Year 2000 Population Projections, 1975-1999
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Population Projections
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year

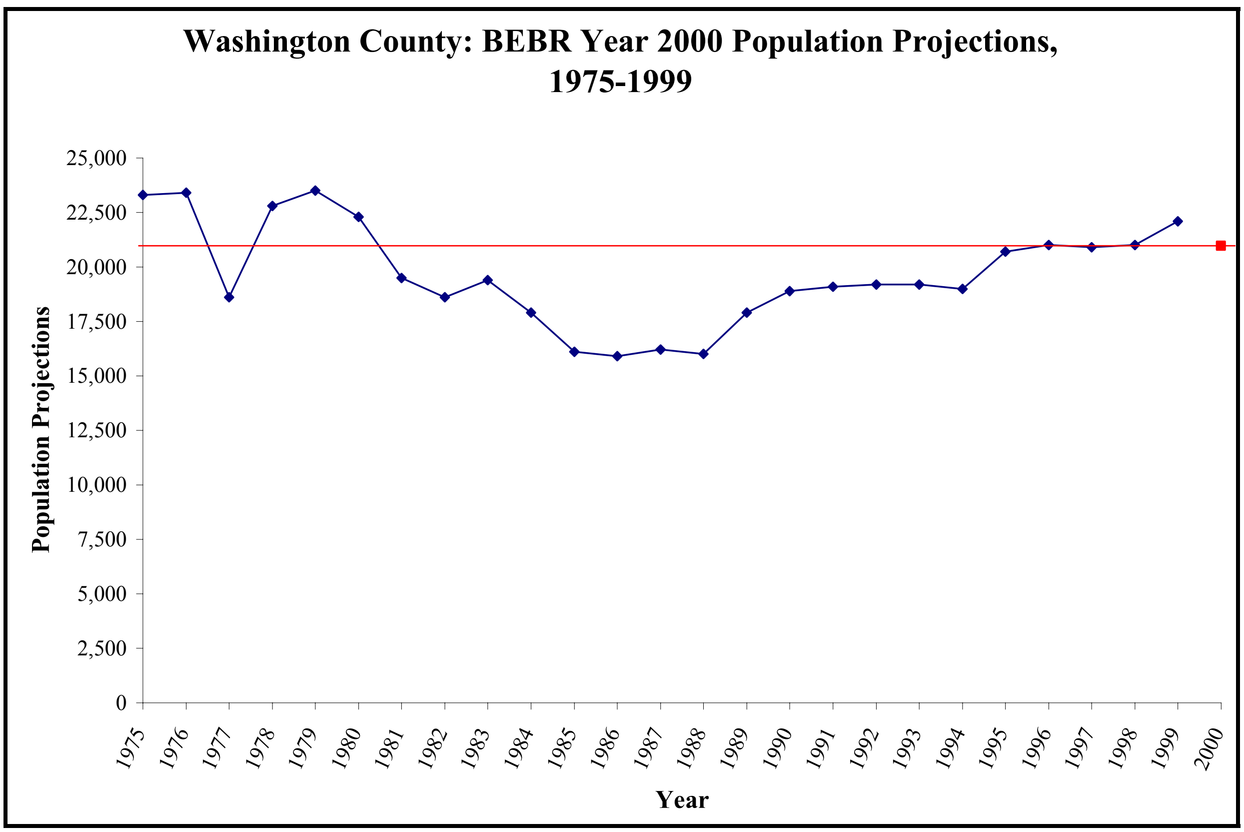

Taylor County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
25,000
22,500
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000


Union County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000


Volusia County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
0
50,000
100,000
150,000
200,000
250,000
300,000
350,000
400,000
450,000
500,000
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000


Wakulla County: BEBR Year 2000 Population Projections, 1975-1999
Population Projections
Year
0
2,500
5,000
7,500
10,000
12,500
15,000
17,500
20,000
22,500
25,000
1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000


Walton County: BEBR Year 2000 Population Projections,
1975-1999
Population Projections
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year


Washington County: BEBR Year 2000 Population Projections,
1975-1999
Population Projections
25,000
22,500
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year

APPENDIX C EXAMPLE FORECAST SCENARIO

Note: The following forecast scenario was produced by the *Florida Planning Development Laboratory* under contract with Franklin County as part of their Comprehensive Plan Update. This scenario was developed and then utilized in the preparation of a population forecast for Franklin County.

A POPULATION GROWTH SCENARIO FOR FRANKLIN COUNTY

Proper population forecasting requires the development of a plausible and accurate growth scenario that outlines the type of growth expected in the county and that identifies the factors that are driving population growth in the community. In addition, it is useful to identify those factors that serve to limit growth in the county. This section presents a growth scenario for Franklin County through the year 2030. This scenario was developed through interviews with local experts on Franklin County, reviews of planning documents and print media, and analysis of population and economic data for the county, the region, and the state.

C.1 Dimensions of Growth in Franklin County

A key element in developing a population forecast for Franklin County lies in understanding current and emerging growth pressures in the county. The previous section provides some insights into the local conditions in the county, but also underscores that Franklin County is experience not one, but two different growth pressures: 1) *Historic Growth Trends* and 2) *Emerging Development Trends*. These pressures are discussed further below. There is also the issue of part-time residents and day trippers in Franklin County, an issue that will also receive some attention below.

C.1.1 Historic Population Growth

Franklin County has experienced growth in the past thirty years at growth rates ranging from 7.5% to 17.0%. This growth is in part due to the continued attractiveness of Florida and the region to retirees and younger families that come to the state and region for the climate and the still growing economy. There is every expectation that the state and the region will continue to grow in the coming decades. Reflecting this, the Bureau of Economic and Business Research

(BEBR) projects Florida's population to grow to 24.5 million residents by 2030, an increase of roughly 53%. Similarly, BEBR projects Florida's Great Northwest to have over 1.7 million new residents by 2030, an increase of over 42%.

Given the continued growth of the state and region, it is reasonable to expect Franklin County to continue to experience population growth in the coming years. Reflecting this ongoing growth, the number of new home start-ups have numbered between 130 and 180 between 2000 and 2002 (Census Bureau Building Permit Data, 2003). Planning staff in the county estimate that between 1990 and 2002 there were 1,350 building permits for houses and 1,000 building permits for mobile homes issued (Pierce, 2003). In sum, the county continues to add new homes and new residents, generating population increases in the coming years.

C.1.2 Emerging Development Trends

While historic population growth is a factor in the county's growth, the issue driving this effort to develop a population forecast for the county largely revolves around emerging development trends in the county. As detailed earlier, a major landowner in the county, St. Joe/Arvida, has begun construction on a 499 home development in the eastern end of Franklin County called SummerCamp. This development will be one of the largest planned communities in the county's history and it may portend the emergence of Franklin County as a very desirable location for large-scale residential development. Throughout the county's history, residential development has typically come in incremental increases to the housing stock, not through large-scale projects such as SummerCamp.

In addition to SummerCamp, other large scale developments have broken ground in the county. St. James Bay is a 370 acre residential community that will be Franklin County's first golf community. With upwards of 500 homes at final buildout, St. James Bay is another project that, if successful, will provide evidence that there is a market for golf communities in the county. Gramercy Plantation is another project that has been in development for years. Originally slated as a golf community, current plans call for approximately 160 homes, but no golf course. Other smaller developments, such as the thirty-three lot Hidden Harbor development, are also at various stages of the planning development process at this time.

These large scale development projects represent the second major growth pressure influencing Franklin County's future population levels. While individually these projects will not add substantially to the county's population (see *Section C.1.3* below for further discussion of the full-time/part-time residential population issue), cumulatively they could contribute to substantially higher growth rates than previously experienced in the county. In addition, there is a consensus that the financial success of these projects would lead to further large scale development projects in the county by St. Joe and other developers. While St. Joe has not made public any other development plans for Franklin County, their emergence as a major residential real estate development entity and their substantial land holdings along the Gulf Coast offer the potential for other development projects in the coming decades.

C.1.3 Day Trippers and Part-Time Residents in Franklin County

One final issue requiring some discussion is that of part-time residents and day trippers in the county. While Franklin County's official residential population is currently estimated at around 10,000 people, the county experiences massive influxes of seasonal and day visitors to enjoy the environmental and small-town amenities offered by the county. Local insiders estimate St. George Island's population to be upwards of 15,000 people during the peak summer months (Franklin County Roundtable, 2003). While an influx of people to an area brings dollars to the local economy, there are also substantial direct and indirect costs associated with these day trippers and part-time residents. These visitors require services from the local government, such as waste management or police and fire services. They also require infrastructure in place to service these groups such as roads, potable water, and sewer services.

While the positive impact on local economies and service demands of these non-permanent residents are clear, there is no easy way to capture the number of day trippers and part-time residents in the county at any point in time. For this reason it is very difficult to generate projections for these groups. Consequently, population forecasts will often simply ignore these groups and make no effort to count them.

However, given the needs of Franklin County to have an estimate of these part-time residents, an effort has been made to project the increase in part-time residents in the county in the coming years. Using the idea of a 'functional population', part-time residents can be counted and included in a forecast of full-time residents (Nelson and Nicholas, 1992). Under the functional population concept, part-time residents are valued as a proportion of how much time they are expected to spend in the area. For example, if an individual lives in a house in Franklin County for three months of the year, they are counted as one-quarter (.25) of a full time resident. More detail on this methodology is supplied in *Technical Appendix A*.

Unfortunately, an estimate and subsequent projection of day trippers is beyond the scope of this study. This very fluid group is very difficult to estimate as there is no easy means to capture data on them. Indirect measures, such as traffic counts on major highways or counts of automobiles in public parking lots, offer one possibility. Because of the difficulty in capturing this group, no effort has been made to estimate and then project day trippers in this report.

C.1.4 A Tiered Approach to Forecasting Franklin County's Population

Because Franklin County is experiencing these two related, but separable growth pressures, it was determined that a tiered projection method would yield the best population forecast for the county. Using this approach, a 'best projection' would be generated to account for historic growth pressures and a second 'best projection' would be generated to account for new development pressures in the county. In this way these two dynamic processes can be modeled more easily and more accurately. Once these separate population projections are completed, the projections can be combined to provide a population forecast for the county.

In addition, the estimated population impact of new development is also tiered, as a portion of these new homes will generate full-time residents and a portion will generate part-time residents. Separate projections can be generated for new part-time and full-time residents. Once these separate projections have been made they can be included in the final population forecast for the county.

C.2 Factors Driving Population Increases in Franklin County

Numerous forces are currently driving population growth in Franklin County. In addition, other factors will emerge in the near or longer-term future that will also contribute to population growth in the county. This section highlights those factors that are expected to contribute to continued population growth in the coming decades.

C.2.1 Historic Growth in the County

As detailed in an earlier section, Franklin County has grown at a slow, but steady rate since 1950. This growth has occurred prior to any interest by St. Joe and other large developers in the county. It is assumed that Franklin County will continue to experience a population increase over and above any activity attributable to St. Joe's SummerCamp and other large residential development projects.

C.2.2 Continued Growth of the State and Region

Related to the above, the region and the state are projected to add hundreds of thousands of residents by 2030, continuing a longer-term trend that has seen millions of new residents come to Florida from other places in the United States and from abroad. This scenario assumes that the state and region will experience continued population growth and this growth will contribute to Franklin County's population growth.

C.2.3 Current Development Activity by St. Joe and Other Developers

If successful, current residential development projects will bring upwards of 1,500 new residential units to Franklin County by 2010. In this scenario, it is assumed that these projects will be successful and buildout will be completed by 2010, bringing new permanent and part-time residents to the county over and above the historic growth trend.

C.2.4 The Emergence of Florida's Great Northwest as a Successful 'Brand' for the Region

Numerous entities have backed the rebranding of the Florida Panhandle with the moniker 'Florida's Great Northwest'. This effort has been backed by the state's government, local governments, chambers of commerce throughout the region, and by St. Joe and other large corporations. This new 'brand name' is intended to establish the region as a desirable location for retirees and families that have previously been attracted to the central and southern Florida coasts. Given the massive advertising campaign behind this branding effort and the broad-based support for insuring the success of this effort, it is assumed that the Panhandle will be successfully rebranded as Florida's Great Northwest. As a consequence, the region as a whole, and Franklin County more specifically, will establish itself as a desirable region for retirees.

C.2.5 Future Development Activity by St. Joe and Other Developers

Reflecting the emergence of Florida's Great Northwest, it is assumed that large scale development in Franklin County will not end with the completion of the large projects currently underway in the county. It is assumed that other large, new residential development projects will be undertaken by St. Joe or other development entities between 2010 and 2030. Reflecting the increased desirability of Franklin County to retirees and the maturation of the local economy, it is assumed that a greater number of units will come online in the decades of 2010-2020 and 2020-2030. Under this growth scenario, it is assumed that an additional 1,750 new residential units in master planned communities will be completed by 2020 followed by an additional 2,500 units between 2020-2030.

C.2.6 Aging of the Baby Boom Generation

The state and the region have long been attractive to retirees as a place to live. As the baby boom generation ages, the number of people at retirement age will increase substantially. Even if Florida captures the same share of retirees as it has historically, the sheer volume of retirees in the baby boom generation means that the state will see a larger number of people move to the state in the next several decades. This increase in the population 'at risk' to retire and move to Florida suggests will contribute to population increases in the state, the region, and in Franklin County.

C.2.7 A New State Prison in Franklin County

There are currently plans for a new state prison to be located in Franklin County. This prison will have two primary impacts on the future population of the county. First, prisoners will be counted as residents of the county when the prison is completed and occupied. Second, the prison will bring job opportunities to the county that may make the area more attractive as a place to live. For this scenario, it is assumed that a state prison will be built in Franklin County and populated by 2010. The prison is assumed to be of similar size to that in Gulf County (1,200 inmates).

C.3 Factors Limiting Population Increases in Franklin County

Despite the ongoing and emerging new growth pressures on the county, a number of factors will limit population growth from 2000-2030. These limiting factors include a combination of structural, land ownership, and cultural issues, all of which will play a part in checking the growth pressures outlined in *Section C.2*. This section briefly summarizes those major factors that will act to limit population growth in the coming decades.

C.3.1 Regional Location

While Franklin County's rural setting certainly plays a role in its development potential, this has also played a historic role in limiting growth in the area. Franklin County is still in a somewhat remote setting, especially when one looks at the location of major cities in the region. Tallahassee, with a regional population of almost 300,000, and Panama City (Bay County), with a county population of 150,000 residents, are at least an hour's drive from the county. While Franklin County is accessible via major state highways, its location is largely outside of the commuting shed of these major cities in the region. The county's regional location therefore serves to limit the number of people living in the county.

C.3.2 Infrastructure Issues

Another substantial limitation to population growth rests in the availability and quality of physical and social infrastructure in the county. While infrastructure issues can often be overcome through expenditures for upgraded or new facilities, near-term infrastructure issues will certainly act to limit population growth in Franklin County.

Franklin County currently has little sewer capacity to offer to developers, with only Apalachicola currently having excess capacity (Franklin County Roundtable, 2003). The city of Carrabelle is currently working on expansions to their sewage capacity. Similarly, the county has no regional plan for water and sewer services for eastern Franklin County, a plan that would need to be put into place before many new, large residential and commercial projects could come online. The county's potable water situation is better, largely due to the availability of potable water in the county. However, efforts to find potable water on Alligator Point and St. Joe's recent difficulty in drilling to find potable water indicate that, while water is available, the costs of finding and acquiring this water may act to limit development (Franklin County Roundtable, 2003).

Transportation infrastructure in the county and region may also limit development in the near term. While the county currently has sufficient road infrastructure, substantial residential growth would almost certainly require a widening of the major east-west road through the county, SR98, and perhaps additional new roads as well. At a regional level, there has been some work towards relocating the Panama City-Bay County Airport, an effort that would bring expanded and upgraded air facilities closer to Franklin County. There has also been some very preliminary discussions concerning the future of the Apalachicola Municipal Airport. While improvements to either or both airports would increase the accessibility of Franklin County, contributing to population increases in the long run, these plans remain in the early stages and any improvements to these facilities are still years away. For the near-term, a lack of air accessibility will continue to hinder development in Franklin County.

The county's health services infrastructure also may act to limit population growth in the community, particularly among more senior retirees. Local experts indicated that the lack of medical and health services have generally led older retirees (characterized as above age 75) to relocate out of the county for better access to doctors and other medical personnel (Franklin County Roundtable, 2003). In addition, there are currently no longer any retirement homes in Franklin County.

C.3.3 Large Public Land Holdings

The substantial percentage of land in Franklin County that is owned by public entities (local, state, and federal governments) will serve to limit growth in the coming decades as well. The public sector owns approximately 62% of the county, removing effectively three-fifths of the county from the development cycle. While much of these substantial holdings lie inland, the state owns pristine land along many of the barrier islands and on Bald Point (see *Map 1.2*)

C.3.4 St Joe Land Holdings

The presence of St. Joe and their plans to develop SummerCamp certainly increase the likelihood of population increases in the county at or above historic levels. However, St. Joe's extensive land holdings, especially in eastern Franklin County (see *Map 1.2*), may actually act to limit development in the coming decades. With these massive land holdings, St. Joe can control the pace and form of development to their liking. To date St. Joe has given no indication of any further development plans for Franklin County.

In addition, St. Joe's approach to developing their communities appears to be one that might best be characterized as 'deliberate'. St. Joe has shown a willingness to engage communities in their development processes and to actively participate in the public planning process. The company has also shown a propensity to plan their projects with fine detail and to begin construction only after a lengthy project planning process. In short, St. Joe has a history of moving carefully and deliberately through the planning and development process. As a consequence, any new large scale residential development projects in Franklin County that are undertaken by St. Joe will take a number of years in the planning stages prior to breaking ground. This deliberate development approach will contribute to slower growth rates in Franklin County than have been experienced in other coastal counties where a large percentage of the coastal land was not owned by a single entity.

C.3.5 The State's Role in Limiting Development in Franklin County

The state of Florida has historically shown a great interest in Franklin County and the Apalachicola Bay. Franklin County was originally listed by the state of Florida as an Area of Critical State Concern (ACSC), a designation that brings to bear further state oversight and requires state staff to review all local development projects. This designation was originally granted due to the importance of the Apalachicola Bay to the state's environmental and economic health. Much of the area was de-designated as an ACSC in 1993. However, the state has expressed continued interest in Franklin County, an interest that led to the ongoing update of the county's Comprehensive Plan of which this report is a part. This legacy of state oversight will continue play a role in limiting population growth in the county.

In addition to the ACSC designation, the state of Florida has in place extensive growth management legislation that serves to manage growth development in the state. In St. Joe's case, the SummerCamp project was limited to 499 units in part to avoid the designation of this project as a Development of Regional Impact (DRI). DRIs are large scale developments that meet certain minimum thresholds set by the state. Once designated a DRI, a project requires review and input from all jurisdictions deemed impacted by the project. In addition, DRIs require state review as well. Developers routinely work around the edges of the DRI designation in an effort to avoid this much more extensive and time consuming planning process. The DRI process can effectively act as a cap on large scale development projects, limiting the number of units in the project. These state growth management-related factors will also contribute to slower growth rates than would otherwise be expected.

C.3.6 County Culture

Lastly, Franklin County's local culture may act to limit population growth in the coming years as well. The county has a long history of low density development, low taxes, and adequate, but limited public services and infrastructure. The county currently does not allow development at densities greater than one unit per acre throughout much of the county. In addition, there are very few multi-family housing projects in the county, although 60 condominium units have been approved in the county in the last two years (Franklin County Roundtable, 2003). Franklin County also has a history of very low tax rates and, consequently, low service levels. The county has the second lowest property tax rates in the region. While low tax rates can make an area attractive to development, in Franklin County this has translated into limited public services and limited infrastructure (as discussed in *Section C.3.2*).

In addition to the political culture, there is a very strong community environmental ethic evident in Franklin County. There are numerous environmental groups that have very closely monitored St. Joe's development plans, as well as those of other developers. In addition, public meetings held as part of the Comprehensive Plan update have underscored that many citizens in the community are interested in the development of the county. Lastly, the importance of the Apalachicola Bay to the community, the region, and the state has taken root in the local culture, insuring that the development process needs to be negotiated carefully and deliberately in

Franklin County. All of these factors contribute to a public culture that is prone to work against development and to slow the development process down. Taken together, these factors will act to slow growth rates in the county.

C.4 Potential Analogues for Modeling Franklin County's Population Growth

Another consideration in the development of a population forecast would be to look to the experience of other counties in the region. An identification of counties that have already experienced a transition from small rural county to growing retiree and tourism destination might provide some insights as to expected growth rates in Franklin County in the coming years. To identify these historical analogues, two primary criteria were utilized. The counties needed to be coastal counties and their population had to remain stable between 7,000 and 15,000 persons for several decades in the latter half of the 20^{th} Century. These criteria would identify those counties that were established rural communities that began to experience growth in an era of suburbanization and mass retirement to Florida. In reviewing population trends for coastal counties in Florida, one county appears to be of particular use as an analogue for Franklin County: Walton County.

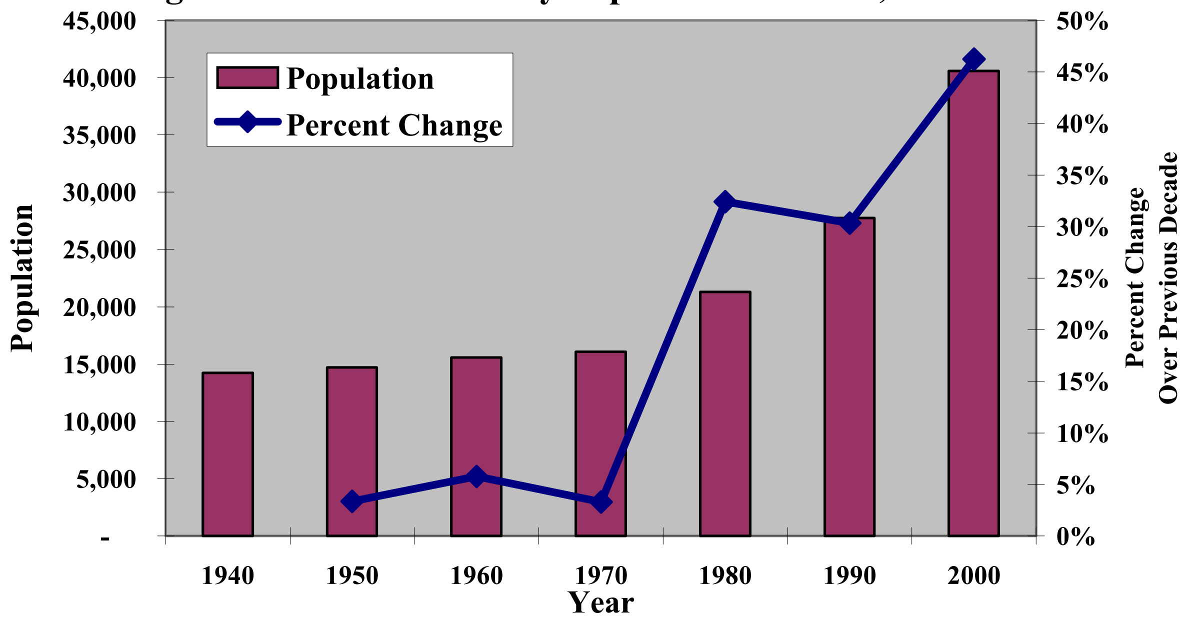
Walton County is located roughly eighty miles to the west of Franklin County, along the Gulf Coast of the state. Similar to Franklin County, Walton historically is a rural county not dominated by any one large city. There are three incorporated cities in the county, DeFuniak Springs (2000 population: 5,089), Freeport (1,190), and Paxton (656). There are also a number of small unincorporated towns scattered along the coast of the county as well. Walton County is also experiencing growth due to residential projects that have been developed by St. Joe, including WaterColor and WaterSound. Lastly, as detailed in other sections of the report, Walton County and Franklin County have similarities along many demographic and socioeconomic attributes. In sum, Walton County's population growth over the last several decades may provide a useful model for what may occur in Franklin County in the coming decades.

Figure C.1 illustrates Walton County's population and growth rates from 1940-2000. This figure illustrates that Walton County's population held steady for several decades, until 1970, with minimal population growth. However, once 'discovered' as a desirable recreation and retiree location, population growth increased dramatically. Growth rates of 3-5% in the 1940s-1960s were increased tremendously and Walton County has experienced growth rates no less than 30% per decade since.

While Walton County's experience might suggest that Franklin County may see markedly increased growth rates in the coming years, these findings are tempered somewhat by one factor. Walton County lies between Bay County and Okaloosa County, both of which are home to large and fast-growing cities, Panama City and Ft. Walton Beach/Destin, respectively. Walton County is therefore sandwiched between two very fast-growing areas and some of the growth in the county is directly attributable to their regional location and growth in neighboring counties that is spilling over into Walton.

Franklin County's more remote location buffers it from experiencing this spillover effect. The counties adjacent to Franklin County are at this time growing, but none with large cities that might cause spillover growth into Franklin. However, the experience of Walton County suggests that coastal counties that emerge as desirable locations can see growth rates well above their historic levels.

Figure C.1 Walton County Population Growth, 1940-2000



C.5 A Population Growth Scenario for Franklin County, 2000-2030

Given the above factors driving growth and factors constraining growth, what does the future of Franklin County likely hold? These existing and emerging trends indicates that Franklin County's population will no doubt increase over the next three decades. This growth will be above historic growth rates. However, while forces are driving increased growth rates, a number of forces will check these growth rates and keep them from attaining levels experienced by other coastal counties like Walton.

The following assumptions are considered in the development of a population forecast for the county:

1) No wars, sustained and long-term economic recessions, or natural disasters will come to the region and devastate the county.
2) SummerCamp and other in-development projects will be built out by 2010.
3) A state prison will be funded by the state and be built by 2010 in the county. This prison will bring 1,200 new 'residents' to the community in the form of prisoners.
4) Additional large-scale residential projects will be developed between 2010-2030. It is assumed that an additional 1,750 new residential units in master planned communities will be completed by 2020 followed by an additional 2,500 units between 2020-2030.

Given the trends identified, Franklin County's population is expected to grow in the coming decades. *Figure C.2* summarizes these pro-growth and slow-growth trends and lays out the expected range that the population forecast should fall within. It is important to note that the two future population lines do not represent population forecasts, but rather serve as 'brackets' to the forecast to be generated. This section of the report is intended to offer guidance in the development of the forecast and to make explicit the assumptions and trends considered in the development of this forecast.

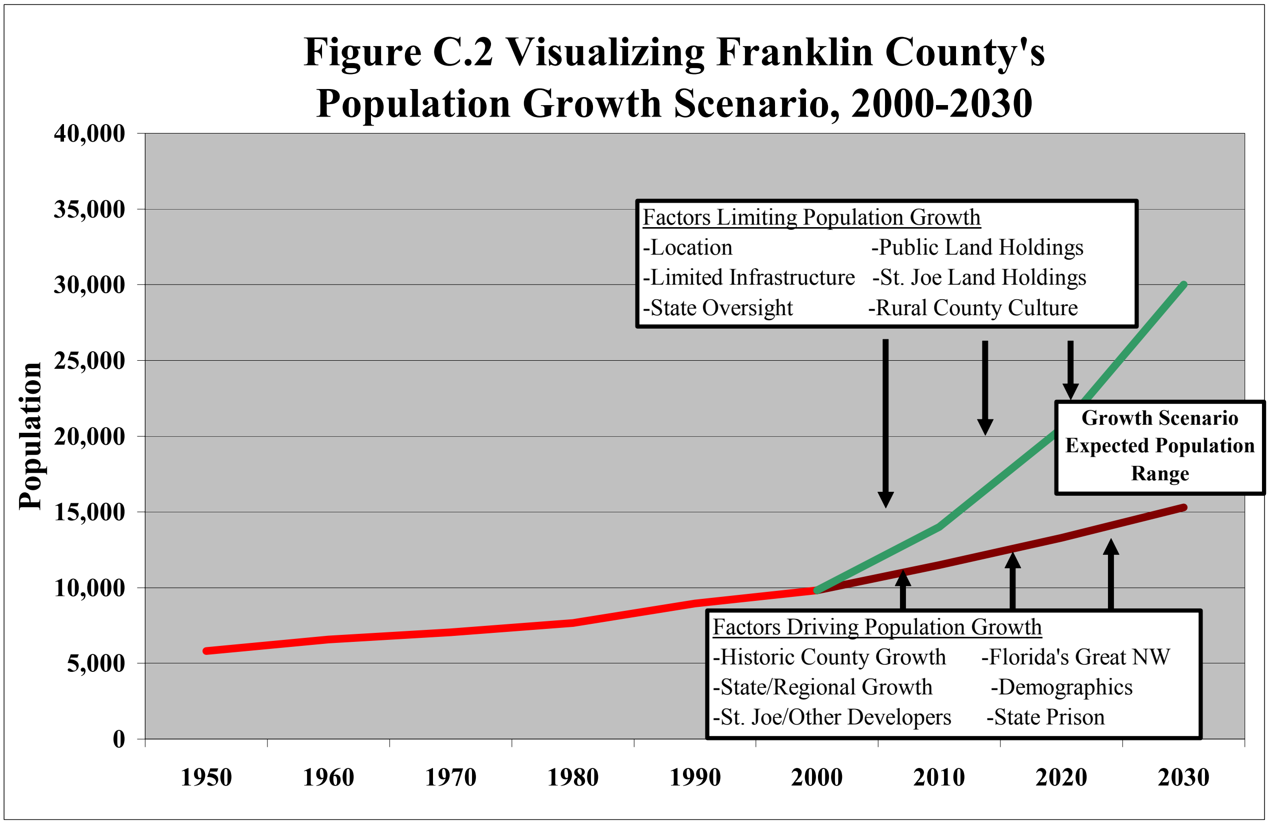


Figure C.2 Visualizing Franklin County's Population Growth Scenario, 2000-2030
Population
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1950
1960
1970
1980
1990
2000
2010
2020
2030
Factors Limiting Population Growth
-Location
-Public Land Holdings
-Limited Infrastructure
-St. Joe Land Holdings
-State Oversight
-Rural County Culture
Growth Scenario Expected Population Range
Factors Driving Population Growth
-Historic County Growth
-Florida's Great NW
-State/Regional Growth
-Demographics
-St. Joe/Other Developers
-State Prison