

Jefferson County Coordinated Population Forecasts

Prepared for

Jefferson County
by

ECONorthwest

99 W. Tenth, Suite 400
Eugene, OR 97401
(541) 687-0051

Final Report

April 2006

Table of Contents

	Page
SUMMARY	III
I. INTRODUCTION	1
Background	1
Organization of this report.....	2
II. DATA SOURCES AND METHODS.....	3
Issues with small area forecasts	5
III. FACTORS AFFECTING LONG-TERM GROWTH IN JEFFERSON COUNTY.....	9
Development trends	10
Regional population trends	9
Other factors	10
IV. JEFFERSON COUNTY POPULATION FORECASTS: 2005-2030	16
Population Forecasts	16
Factual Base	19
Summary of Findings	26
V. UNINCORPORATED JEFFERSON COUNTY POPULATION FORECAST.....	29
Forecast Table.....	29
Factual Base	31
Summary of Findings	35
VI. CULVER POPULATION FORECAST.....	37
Forecast Table.....	37
Factual Base	39
Summary of Findings	44
VII. MADRAS POPULATION FORECAST	46
Forecast Table.....	46

Factual Base	48
Summary of Findings	53
VIII. METOLIUS POPULATION FORECAST	55
Forecast Table.....	55
Factual Base	57
Summary of Findings	62

SUMMARY

This report presents analysis and findings in support of a coordinated population forecast for Jefferson County and the cities of Culver, Madras, and Metolius from the year 2005. Table S-1 presents the population forecast for each jurisdiction and the entire County as of July 1 for each five-year period.

Table S-1. Jefferson County Coordinated Population Forecast

Year	Culver	Madras	Metolius	Unincorp	County
2005	1,019	5,592	804	13,185	20,600
2010	1,193	6,969	901	15,052	24,114
2015	1,375	8,519	1,009	16,566	27,469
2020	1,578	10,365	1,131	18,004	31,079
2025	1,812	12,610	1,267	19,473	35,162
2030	2,012	14,510	1,381	20,501	38,404
2035	2,216	16,465	1,495	21,400	41,576
2040	2,440	18,683	1,619	22,268	45,011
2045	2,687	21,201	1,752	23,088	48,729
2050	2,960	24,057	1,897	23,840	52,754
2055	3,259	27,298	2,054	24,500	57,111

Jefferson County developed the forecasts to comply with the coordination requirement of ORS 195.036. This report provides background information and findings on data sources and forecasting. It describes population changes in the County and the three cities from 1980 to 2005. The report also compares the forecast in Table S-1 with population forecasts for Jefferson County prepared by the State of Oregon Office of Economic Analysis in 1997 and 2004.

The forecasts for the County are higher than the OEA 2004 forecasts, but lower than the 1997 forecasts. The County chose to develop and justify a forecast different than OEA's because of recent development trends that suggest a higher growth rate is justified. Moreover, the county forecast considers the implications of the Deer Ridge Correctional facility that will be completed by 2010. The facility will employ 400-500 people and will house 2,100 inmates.

The forecasts presented in this report cover a 50-year period from 2006-2056 and are based on 2005 population estimates from the Population Research Center at Portland State University. They include figures for each year during the forecasting period and are based on review of historical data, other forecasts, and other factors that will influence population growth over the forecasting period.

The forecasts generally use a compounding methodology, with some adjustments to account for the impact of the correctional facility. Consistent with the OEA forecasts, population growth rates are assumed to decrease in all of the geographic areas during the 2030-2056 period.

I. INTRODUCTION

This report presents coordinated population forecasts for Jefferson County and its incorporated communities consistent with the requirements of ORS 195.036. The forecast period extends from 2006 to 2056. The forecasts are based on 2005 population estimates from the Population Research Center at Portland State University. The report presents data and findings in support of both a countywide population forecast as well as allocations of that population to Culver, Madras, Metolius, and unincorporated areas of Jefferson County.

BACKGROUND

Local governments in Oregon have developed and adopted population forecasts for planning purposes since the inception of the statewide planning program. The forecasts are used for many purposes including determining the size of Urban Growth Boundaries (UGBs), capital improvement planning, and other planning activities. For example, Oregon state planning law (ORS 197.295 – 197.296) requires cities to plan for needed housing to accommodate population growth in urban growth boundaries. ORS 197.712 also requires cities to ensure that sufficient land is available in urban growth boundaries for commercial development and economic growth.

One problem that emerged from the forecasting process was consistency. In many instances the forecasts of incorporated cities would sum to a figure far higher than the county forecast. In 1995, the Oregon Legislature recognized a need for local consistency in population forecasting and for a coordinated statewide forecast by adding a statute requiring counties to:

“...establish and maintain a population forecast for the entire area within its boundary for use in maintaining and updating comprehensive plans, and shall coordinate the forecast with the local governments within its boundary.” [ORS 195.036]¹

The legislature designated the state Office of Economic Analysis (OEA), a division of the Department of Administrative Services, as the primary forecasting agency for the state of Oregon. The OEA prepares population and employment forecasts for the state and each county. The OEA prepared state and county population forecasts in 1997 and again in 2004. These forecasts are intended to serve as a basis for county-level population coordination.

Population forecasts must be coordinated by a designated “coordinating” agency; in this case Jefferson County. The combined sum of forecasts for incorporated cities and rural areas must roughly equal the forecast for the county as a whole (the county “control total”).² The control total usually comes from the long-term population and employment forecasts developed by the Office of Economic Analysis of the State Department of Administrative Services.³ The most recent OEA forecasts are from 2004. As an alternative to the OEA forecast, the jurisdictions (county and cities) can develop, justify, and come to a consensus on a population forecast, which

¹ 1995 House Bill 2709 (ORS 197.296)

² The forecasts for incorporated cities includes all lands within the existing Urban Growth Boundaries (UGBs) of those cities. In short, the forecasts are for growth in the UGBs.

³ While most coordinating bodies use the OEA forecasts as the basis for coordination, there is no statutory requirement that the OEA forecasts be used.

must be presented to the Department of Land Conservation and Development. An adequate factual base must support such a forecast.

The 1997 and 2004 OEA forecasts for Jefferson County are considerably different. The 1997 forecast presented a 2030 population of 38,434, while the 2004 forecast presented a 2030 population of 30,831. Thus, OEA reduced the County's forecast by 7,603 persons in its 2004 forecasts. This report includes an evaluation of the OEA 1997 and 2004 forecasts and presents findings that support a figure that is higher than the OEA 2004 forecast.

In summary, this report presents data and findings that support a defensible county population forecast from the year 2005 to the year 2030 and allocates that population to incorporated and unincorporated areas of the County.⁴

ORGANIZATION OF THIS REPORT

The remainder of this report is organized as follows:

- **Section II, Data sources and methods** presents both the data used to create the forecasts and some difficulties with small area forecasts.
- **Section III, Factors affecting long-term growth in Jefferson County** discusses some of the factors that will affect long-term growth in the County.
- **Section IV, Jefferson County 2005-2056 population forecast** presents the coordinated population forecast for Jefferson County and data that support the forecast.
- **Section V, Allocation of population to unincorporated areas** presents a forecast for growth in unincorporated Jefferson County, data that support the forecast, and a summary of findings.
- **Section VI, Culver population forecast** presents a forecast for the City of Culver, data to support the forecast, and a summary of findings.
- **Section VII, Madras population forecast** presents a forecast for the City of Madras, data to support the forecast, and a summary of findings.
- **Section VIII, Metolius population forecast** presents a forecast for the City of Metolius, data to support the forecast, and a summary of findings.

⁴ The next section describes the rationale for using a forecast horizon of 2030.

II. DATA SOURCES AND METHODS

The population forecasts presented in this report build from a range of secondary data sources. All of the data used in developing the forecasts are from easily available standard sources:

- The U.S. Census of population and housing (1980, 1990, and 2000) provides decennial population figures as well as a broad range of demographic and socioeconomic variables;
- The Oregon Office of Economic Analysis (OEA) provides long-term population forecasts;
- The Population Research Center at Portland State University provides annual population estimates (as of July 1 every year) and annexation history for incorporated cities;
- Claritas, Inc. provides custom demographic and market reports for current years; and
- The Jefferson County Community Development Department provided data on building permits and development potential in unincorporated communities.

All forecasts use a base date of July 1—a date consistent with the 2005 base population data from the Center for Population Research at Portland State University.

OEA Forecasts⁵

The OEA uses a cohort component model to develop its forecasts. In general, a cohort component model adds *natural increase (births – deaths)* to *net migration* for specified age cohorts (usually five year increments). This method uses the age/sex groupings of the existing population and assumptions about future aging patterns to estimate birth and death rates to calculate the “natural change” in population. The natural change component is especially useful for areas with a stable population (like many Eastern Oregon cities and counties) or a city with a large retirement population (like Brookings, Oregon for example). However, this component by itself is less accurate when a large share of the forecast increase is due to people moving into the areas. For example, if an area has a high percentage of growth due to in-migration the in-migration numbers can “swamp” the natural increase numbers and make them less important.

Because migration can be a significant part of the growth calculation this method usually considers both the natural increase and migration patterns to generate the total population change. However, as the OEA states in its 2004 long-term forecast, “*Migration is the most complex and most volatile component of population change.*”⁶ The migration component cannot be easily predicted because the reasons people choose to move from one area to another are based on a variety of individual and family decisions including personal choice, economics, quality of life changes, quality of education, safety, political climate and others factors.

⁵ The discussion of OEA methods in this section is summarized from *Deschutes County Coordinated Population Forecast, 2000 – 2025*. Deschutes County, August 2005.

⁶ *Long-Term Population Forecast for Oregon and Its Counties, 2000-2040*, Office of Economic Analysis, 2004, first page.

Alternative County Forecasts

This report presents a comparison of the OEA and an alternative county forecast developed by ECONorthwest. That alternative forecast uses a trend model which assumes that *past growth rates and patterns are the basis for future growth*. This method reviewed population trends as a basis for future growth. Trend data reviewed as part of this analysis included annual population changes, housing starts, age distribution, mobility, and other secondary data. This analysis uses Census data (1980, 1990, and 2000) to evaluate specific population trends.

Trend extrapolation is a simple forecasting method. One benefit of using this method is that many of the factors that affect the pattern of growth are already included in the trend data. In other words, since this method uses the real numbers for historic change it already includes the aggregate result of various growth components such as natural increase from births and deaths, net migration, employment levels, and local and national economic conditions. For example, an average annual growth rate of 1 percent can reflect a rate of change from one time period to the next and reflect population growth due to natural increase and net migration.⁷

This forecast method can be used with assumptions regarding physical and/or political constraints that will control the amount of growth. Physical constraints can include, for example, a limited supply of land for future homes or infrastructure capacity issues. Political constraints can include state planning laws, local policies, zoning limitations or other conditions that constrain or control the level of growth. The physical or political constraints (or a combination of both) can be used to form or adjust the basis for calculating the potential population changes. Examples of political activities that may affect population growth include efforts such as local or state governments' tax incentives to support job creation, active employer recruitment, low impact fees, choosing to locate offices or facilities in an area, and tourism campaigns.

The trend model may also consider the effect of exogenous events. This is relevant to Jefferson County in light of: (1) the development of the Deer Ridge Correctional facility; (2) the explosive growth rates in Deschutes County; (3) recent development activity in Jefferson County; and (4) differences in housing costs between Jefferson and Deschutes counties. These exogenous variables are incorporated into the growth rate assumptions for the County and its cities.

The County and its contractor (ECONorthwest) evaluated several different methods for developing an independent population forecast as well as the allocation of population to subareas of the county including a compounding method, a ratio method, a decreasing rate method, and a straight-line method. We selected the compounding methodology because it is (1) most consistent with historical population growth trends, (2) it is a relatively simple approach that builds from historical data and assumptions about future City and County growth policies, and (3) it assumes that the increment of population growth (e.g., the rate of growth or annual percent change) will be constant. The compounding methodology also assumes that the number of persons added will increase each year.

The County selected the compounding methodology because:

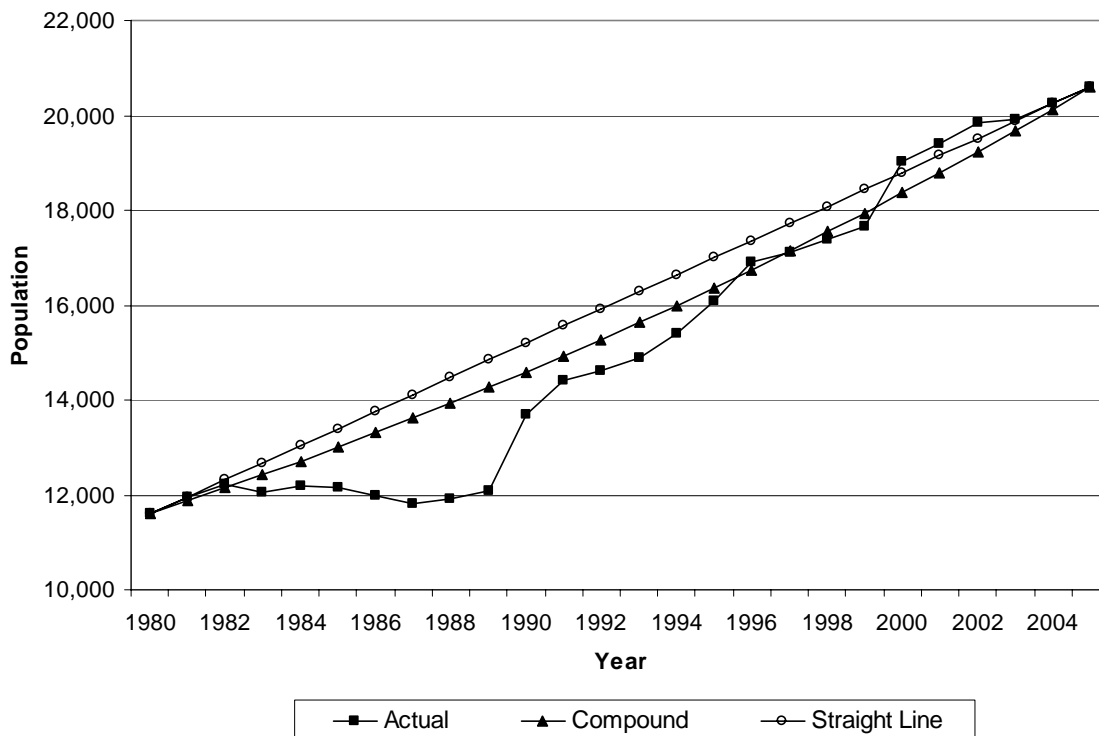
- It provides the best approximation of historical growth trends in Jefferson County;

⁷ This paragraph was adapted from the Deschutes County Long-Range Population Forecasts, August 2005.

- The County has not identified any constraints to population growth;
- It is a simple method that implicitly considers factors that have affected historical population growth;
- The method can consider and incorporate the impact of exogenous events; and
- It is an accepted method for extrapolating population growth trends.

In summary, the compounding approach provides a simple method for extrapolating historical trends to a future population figure. While it does ignore annual variations in population growth that have occurred in the past and will continue in the future, it is at least as justifiable—and perhaps more justifiable—than other assumptions about how population growth rates will vary in the future. Figure 1 graphically displays the differences between (1) actual population growth, (2) a compound growth trend, and (3) a straight-line growth trend based on the amount of growth in Jefferson between 1980 and 2005. The graph shows that the compound methodology is a better (but not perfect) representation of the 25-year growth trend in Jefferson County.

Figure 1. Population Growth, Jefferson County, 1980-2005



Common Assumptions for Forecasts of Jurisdictions in Jefferson County

Jefferson County contains three cities: Madras, Culver, and Metolious. ECONorthwest prepared population forecasts for the areas within the urban growth boundary of each city, as well as

forecasts for the entire County and unincorporated areas of the County. The coordinated forecast for the entire County is shown in Table 3. The following sections present forecasts for each city and unincorporated Jefferson County.

The respective forecasts for all three cities share common assumptions about anticipated population growth and infrastructure. All three assume that during the forecast period (2006 to 2056) the city and/or other providers of infrastructure and public service will be able to serve growing populations. This assumption covers infrastructure customarily provided by cities including roads, water and sewer service. In addition, the forecasts assume that each respective school district will be able to accept and teach new students that enroll in the districts. None of the cities are anticipating the capacities of infrastructure or public institutions such as schools acting as limitations on population growth during the forecast period.

For consistency in using the annual estimates of the Population Research Center (PRC) and the Census Bureau, the jurisdictions decided to use the July 1, 2005 PRC estimate for the county and each city as the base population. The starting populations for each jurisdiction are as follows: City of Madras 2,235; City of Culver 514; City of Metolius 451; and unincorporated Jefferson County 8,399.

ISSUES WITH SMALL AREA FORECASTS⁸

Planning implies forecasting. To use policies to change the future in ways that decision makers think their constituents would find beneficial, one must first have an idea of what could or is likely to occur in the absence of those policy changes.

Forecasting is usually better, and better received, if it is based on a model of how the world works. In the context of housing and economic development, that understanding must certainly include how households and businesses make decisions about where to locate, and what types of buildings to occupy.

In the context of land use and growth management, the main variables that one must forecast are population and employment, which are then used to forecast the demand for new built space (housing, offices, warehouses, retail stores, and so on). The demand for built space creates a derived demand for land on which to build that space.

The amount of land needed depends on the type and density of space that will be built to accommodate population and employment growth. The type and density of development will be a function of market factors (demand and supply conditions) and public policy (especially about density and infrastructure, but also about transportation, economic development, environmental protection, and so on). This function of forecasting is central to Jefferson County and its cities: it will allow cities to determine whether they have sufficient land available to accommodate 20 years of population and employment growth.

The main point is that (1) forecasting growth requires a consideration of many variables that interact in complicated ways, and (2) any forecast of a single future is bound to be wrong—there

⁸ This section is adapted from previous work by ECONorthwest.

are many possible futures that are more or less likely depending on one's assessment of the likelihood of the assumptions.

Before presenting our evaluation of the County coordinated forecasts, it is useful to describe the limitations of small areas forecasts. The fact that the PSU estimates significantly underestimated the 2000 population of several Oregon cities, underscores one of the key problems that emerge with small area population estimates and forecasts. Following is a discussion of why small area forecasts are highly uncertain:

- Projections for population in most cities and counties are not based on deterministic models of growth; they are simple projections of past growth rates into the future. They have no quantitative connection to the underlying factors that explain why and how much growth will occur.
- Even if planners had a sophisticated model that links all these important variables together (which they do not),⁹ they would still face the problem of having to forecast the future of the variables that they are using to forecast growth (in, say, population or employment). In the final analysis, all forecasting requires making *assumptions* about the future.
- Comparisons of past population projections to subsequent population counts have revealed that even much more sophisticated methods than the ones used in the study "are often inaccurate even for relatively large populations and for short periods of time."¹⁰ The smaller the area and the longer the period of time covered, the worse the results for any statistical method.
- Small areas start from a small base. A new subdivision of 200 homes inside the Portland Urban Growth Boundary has an effect on total population of 0.02%. That same subdivision in Madras would increase the community's housing stock by more than 8%—and population by a similar percentage.
- Especially for small cities in areas that can have high growth potential (e.g., because they are near to concentrations of demand in neighboring metropolitan areas, or because they have high amenity value for recreation or retirement), there is ample evidence of very high growth rates in short-term; there are also cases (fewer) of high growth rates sustained over 10 to 30 years.
- Public policy makes a difference. Cities can affect the rate of growth through infrastructure, land supply, incentives and other policies. Such policies generally do not have an impact on growth rates in a region, but may cause shifts of population and employment among cities.

⁹ More complex models exist; they tend to be cost prohibitive for small area population forecasting. For example, OSU Extension has conducted runs of an econometric model called IMPLAN to model the economic impacts (including number of dwellings) of the Deer Ridge Correctional facility.

¹⁰Murdock, Steve H., *et. al.* 1991. "Evaluating Small-Area Population Projections." *Journal of the American Planning Association*, Vol. 57, No. 4, page 432.

Because of the uncertainty associated with small area forecasts, many forecasts present ranges of future population. ORS 195.036 is not explicit on the issue of whether ranges are appropriate (or legally acceptable), however, the OEA forecasts are point forecasts (e.g., they reflect one rate and a single future population) as are coordinated forecasts at the city level.¹¹ Cities have many reasons to use point forecasts: among the most important are projections of future revenues, need for infrastructure, and need for land. These factors provide sufficient rationale for cities to develop and adopt point forecasts. That fact, however, does not mean they are any more accurate.

In summary, the longer the forecast, the greater the potential that actual population growth will vary from the forecast. This implies that cities should closely monitor actual population growth so that either (1) plans can be modified to account for variations, or (2) policies can be implemented that increase the likelihood of achieving the population growth.

One final comment on forecasts: population forecasts are often viewed as “self-fulfilling prophecies.” In many respects they are intended to be; local governments create land use, transportation, and infrastructure plans to accommodate the growth forecast. Those planning documents represent a series of policy decisions. Thus, how much population a local government (particularly cities) chooses to accommodate is also a policy decision. In short, the forecast and the plans based on the forecast represent the city’s future vision.

¹¹ ECO is unaware of any coordinated forecasts that present ranges. It is not uncommon, however, for cities to consider ranges of population and employment during planning exercises.

III. FACTORS AFFECTING LONG-TERM GROWTH IN JEFFERSON COUNTY

This section discusses some of the factors that affect long-term growth in Jefferson County. These factors include development trends, regional population trends, and other factors such as development of a state prison near Madras.

REGIONAL POPULATION TRENDS

Population growth in Oregon tends to follow economic cycles. Oregon's economy is generally more cyclical than the nation's, growing faster than the national economy during expansions and contracting more rapidly than the nation during recessions. This pattern is shown in Table 1, which presents data on population in the U.S., Oregon, and selected areas in Oregon over the 1980–2005 period. Table 1 shows Oregon grew more rapidly than the U.S. in the 1990s (which was generally an expansionary period) but lagged behind the U.S. in the 1980s. Oregon's slow growth in the 1980s was primarily due to the nationwide recession early in the decade. Oregon's population growth regained momentum in 1987, growing at annual rates of 1.4%–2.9% between 1988 and 1996.

Population growth for Oregon and its regions slowed in 1997, to 1.1% statewide, the slowest rate since 1987. Net migration into Oregon, which is the largest component of population growth, dropped from 35,000 in 1996 to 18,000 in 1999. The reasons most often cited for this slowing of population growth are the recovery of the California economy, the combination of a high cost of living (especially housing) and low wages in Oregon, and a perceived decline in the quality of Oregon's schools.

Jefferson and Deschutes Counties grew faster than any other areas in Table 1 throughout the 1980–2000 period. Jefferson County's population grew at an average annual rate of 3.35% between 1990 and 2000, adding 5,333 persons. During the same period, Deschutes County was the fastest growing county in Oregon, growing at an average annual rate of 4.25% and adding 24,333 persons. Madras grew at an average rate of 3.96%.

Table 1. Population in the U.S., Oregon, Deschutes County, Jefferson County, Madras, Metolius, Culver and Unincorporated Jefferson County, 1980 to 2005

Area	Population				Average Annual Growth Rate			
	1980	1990	2000	2005	1980-1990	1990-2000	1980-2000	2000-2005
U.S.	226,545,805	248,709,873	281,421,906	296,410,404	0.94%	1.24%	1.09%	1.04%
Oregon	2,639,915	2,842,321	3,421,399	3,628,700	0.74%	1.87%	1.30%	1.18%
Deschutes County	62,142	74,958	115,367	142,380	1.89%	4.41%	3.14%	4.30%
Jefferson County	11,599	13,676	19,009	20,600	1.66%	3.35%	2.50%	1.62%
Madras	2,235	3,443	5,078	5,592	4.42%	3.96%	4.19%	1.95%
Metolius	451	450	635	804	-0.02%	3.50%	1.73%	4.83%
Culver	514	570	802	1,019	1.04%	3.47%	2.25%	4.91%
Unincorporated Jefferson County	8,399	9,213	12,494	13,185	0.93%	3.09%	2.01%	1.08%

Source: U.S. Census and Population Research Center at Portland State University

DEVELOPMENT TRENDS

Residential development is a key factor directly correlated with population growth—households cannot (and will not) move to an area without housing. One way to track residential development is to compare the number of permits issued for new residences. Examining the number of building permits issued can provide an indication of the level of potential building activity (it does not indicate the amount of actual residential development because a building permit does not guarantee development). The construction of a dwelling unit will eventually result in a population increase as the dwelling gets occupied.

Table 2 presents the number of permits issued in Jefferson County for new residences between 2000 and 2005. The number of permits issued between 2000 and 2004 was relatively stable and averaged around 98 permits per year. The number of permits issued in 2005 increased significantly to 265. The increase in the number of building permits indicates an increase in development activity in Jefferson County. This suggests that external factors are strongly influencing demand for housing in the County.

Table 2. Permits issued by Jefferson County for new residences, 2000 to 2005

Year	Permits Issued
2000	106
2001	97
2002	90
2003	98
2004	98
2005	265

Source: Jefferson County

OTHER FACTORS

The following are some other factors that are likely to stimulate growth in Jefferson County over the long-term. These factors include: increasing housing values in Central Oregon, development of retirement and destination communities in Jefferson County, recent development trends in

Madras and other communities, and construction of the Deer Ridge Correctional Institution east of Madras.

Housing values in Central Oregon

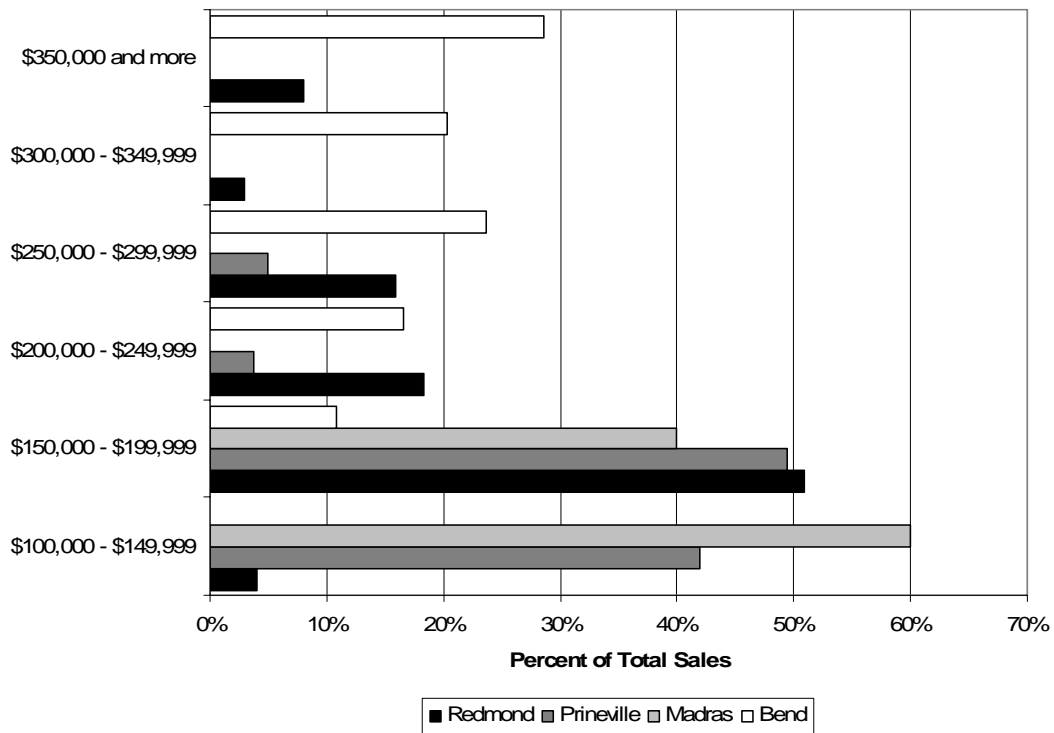
Housing cost is one of several factors that influence households' choices about where to live. It is difficult to separate cleanly the reasons that individual households and firms make location and structure choices from the reasons that urban areas grow: an urban area grows because households and firms make decisions to locate there.

The choice between location and structure, and the geographic level of location choice, also overlap. It is probably reasonable to assume that for most firms and businesses, the decision about a regional location comes first: what state or metropolitan area is most desirable? Having made that choice, households and businesses then make a more specific (intra-regional) location choice based on some similar, and some different or more detailed, criteria. For example, a household may move to central Oregon primarily for a job opportunity (and the general quality of life benefits of central Oregon). But once that decision is made, it then considers things like community, school districts, lot size, housing price, and proximity to work and shopping locations. The literature on housing recognizes this point, making a distinction between the mobility choice (what region to live in) and the housing choice (type, tenure, cost, of housing, and sub-area to locate in).

The literature is inconclusive on the relative weight of site and structure characteristics in housing location choice. Based on a household survey, Wachs, et. al. (1993) concluded "...commuting distance is likely to be a secondary consideration in choosing where to live; housing costs, quality of schools, and safety from crime were anticipated to generally to play a much larger role."

Housing costs in Deschutes and Jefferson Counties vary, depending on the proximity to Bend. Figure 2 shows the percent of new homes built and sold in 2005 for Prineville, Redmond, and Bend. Homes in Bend are the most expensive, with more than 40% of homes having a sales price of \$300,000 or greater and none recorded for less than \$150,000. About three-quarters of new homes in Redmond sold for \$150,000 to \$249,999. New homes in Prineville were the least costly and generally sold for less than \$200,000. Madras was the most affordable market—60% of homes sold in 2005 in Madras sold for less than \$150,000.

Figure 2. Percent of new home built and sold in 2005, grouped by sales price for Prineville, Redmond, and Bend



Source: Multiple Listing Service (MLS), 2006

MLS data also show a rapid increase in sales prices between 2004 and 2005. The average sales price in Bend increased nearly 16% between 2004 and 2005; Redmond’s increase was nearly 25%, while Prineville’s increase was nearly 32%. The rapid increase in housing costs in Bend has caused households to look to first Redmond and then Prineville for more affordable housing. Moreover, lot prices are significantly lower in Madras. In 2005, the average subdivision lot in Madras sold for about \$32,000. This compares favorably with Bend (\$150,000), Redmond (\$90,000), and Prineville (\$58,000). The data clearly indicate that land costs in Madras are significantly less than Bend, Redmond or Prineville. Recent development trends in Jefferson County suggest that households will begin seeking more affordable housing options in the County which will result in higher population growth rates.

Table 3. Distribution of new home sales prices for selected subdivisions in Central Oregon cities, 2004 and 2005

	Bend	Redmond	Prineville	Madras
Number of Sales				
2004	349	229	64	3
2005	487	341	86	21
Average Sales Price				
2004	\$253,291	\$176,152	\$127,603	\$133,167
2005	\$293,487	\$219,544	\$168,051	\$153,044
Change in Average Sales Price				
Dollars	\$40,196	\$43,392	\$40,448	\$19,877
Percent	15.9%	24.6%	31.7%	14.9%

Source: Multiple Listing Service (MLS), 2006

The regional housing price differentials appear to have had a profound affect on commuting patterns. The Comprehensive Economic Development Strategy (CEDS), Regional Data Profile (page 10), shows Jefferson County with the highest level of workers commuting to another county for employment than any other county in the region. The data indicate that 24.4% of the Jefferson County workforce commute to another county for employment, compared to 19.6% in Crook and just 5.8% in Deschutes. In addition, this number has grown by 55% in just 10 years (from 15.7% in 1990). An analysis of the entire CEDS report leads to the conclusion that housing costs have already had a dramatic impact on where people choose to live in Central Oregon.

The housing data show the following trends:

- With respect to housing, Madras is the least expensive community in Central Oregon
- Lot prices are significantly lower in Madras; land is a significant contributor to overall housing prices;
- Development activity is increasing in Jefferson County—due in large part to more affordable housing. A proposed 1,700 unit master planned community in Madras provides evidence of this trend.
- This housing and land price differential will have a measurable impact on population increases in Jefferson County and its communities.

In summary, rapid employment growth near Madras from the correctional facility, combined with new housing opportunities that have very competitive pricing and options, suggests that growth rates in Jefferson County and its cities will occur in the near term (the next 10 years) at rates higher than recent historical averages.

The influence of retirement and destination communities

Central Oregon has many retirement and destination communities. In Oregon, a destination resort is defined as a self-contained development providing visitor-oriented accommodations and

developed recreational facilities in a setting with high natural amenities (Statewide Planning Goal 8). Moreover, a destination resort must be at least 160 acres in area and have at least 50% of the area committed to open space.

Black Butte Ranch, Crooked River Ranch, and Sunriver were among the earliest. More recently, both Sunriver and Eagle Crest have experienced expansions, and several proposed resorts. Roger Lee at Economic Development for Central Oregon identified the following new destination communities:

- Brasada Ranch – 1800 acres on the western slopes of Powell Butte, in Crook County.
- Eagle Crest Resort, just outside the city of Redmond on 1700 acres
- A 400 home expansion of Sunriver
- There are two new proposed destination resorts in Crook County – they have no name yet.

He also mentioned that the following developments are happening in Central Oregon:

- A 1,200 acre residential development in Prineville called Ironhorse
- 2,000 new homes in Bend called Northwest crossing

These developments underscore a Central Oregon trend towards destination resorts and master planned communities. Such developments will require construction and service workers—some of whom will seek affordable housing in Jefferson County. Moreover, the trend is beginning to impact Jefferson County. The City of Madras is proposing a master planned community. This community is proposed to be added to the City's Urban Growth Boundary and while not technically a retirement or destination community, it will share many of the same attributes. Moreover, while the number of new dwelling units is not known at this time, it will have a measurable impact on the housing stock in Madras and Jefferson County—and on population.

Recent development activity

The data shown in Table 2 show a significant spike in residential building permit applications in 2005. The County averaged about 100 new residential permits issued annually between 2000 and 2004. The County approved 265 permits in 2005. The discussion of housing prices and the correctional facility suggest that this trend will continue for at least five years.

Moreover, development proposals that are under review or have been approved suggest a lot of development is in the pipeline. For example, in March 2006 when this report was completed, Madras had over 3,000 single-family dwelling lots either platted or in process of submission for platting. Specifically, the east side development for Madras is planned for 1,700 units, plus commercial. A large Portland developer has submitted a proposal for 230 single-family dwelling units in Madras. These data suggest that Madras alone will average 70-75 new single-family dwellings in the 2007-2009 period and, more than 100 in the 2010-2020 period,

Deer Ridge Correctional Institution

The Oregon Department of Corrections is in the process of building the Deer Ridge Correctional Institution, a 2,100-bed facility approximately three miles east of Madras. The facility will consist of a minimum-security prison with about 864 beds and a medium-security prison with about 1,240 beds. Prison construction began in October 2005. The Department of Corrections expects construction on the minimum-security prison to be completed by December 2006, with completion of the medium-security prison in December 2007.

The prison will affect population growth in Jefferson County in several ways.

- The Department of Corrections expects the cost of building the facilities will be \$193 million, which includes construction, studies, design, property and easement purchases, and infrastructure improvements for public services. Construction firms in Jefferson County are likely to have a part in this construction work, increasing demand for construction workers for the duration of the project.
- The prison will house about 2,100 inmates, increasing Jefferson County's population by this number of people.
- The Department of Corrections expects the prison will employ between 400 and 500 people, with an annual payroll of about \$22 million. These jobs will attract new residents to the County, as well as employing existing residents.

The Department of Corrections also conducted an Community Impact Study (CIS) for the proposed facility. The study, completed by Benkendorf Associates, evaluated the social and economic impacts of the facility. This was done using IMPLAN, an econometric model.

According to the Phase II CIS, the facility will have 507 full-time employees with an average wage of nearly \$44,000 annually. The study also estimates the indirect and induced impact of the prison.¹² The CIS estimates the induced employment impacts that result from operation of the prison to be 1,152 jobs in the 2007-2010 period. The total employment impacts are estimated at 1,666 jobs in the 2007-2010 period. The total compensation is estimated at nearly \$50 million annually.

The CIS also estimates impacts to households, housing and population. It indicates that the prison will result in 829 new households in the County. This equates to demand for 829 new housing units, 557 of which are estimated to be owner units and 272 rental units. The CIS estimates that the prison will have a direct population impact of 2,073 new persons in Jefferson County (not including inmates). These individuals would be on top of any baseline growth projection.

In summary, the Deer Ridge Correctional Institution will impact the population of Jefferson County significantly. It will add 2,100 people in group quarters. Moreover, it will attract new households to the County who work at the facility and choose to live nearby.

¹² According to the CIS, indirect impacts represent the response (change in employment) of all other local industries to a change in the output of a given industries. Induced impacts represent the response (change in employment) of all local industries to an increase in expenditures resulting from new household income generated by direct and indirect impacts.

IV. JEFFERSON COUNTY POPULATION FORECASTS: 2006-2056

Between 1980 and 2005, Jefferson County grew at an average rate of more than 3% per year, approximately twice the growth rate for Oregon. Over that period, Jefferson County added 9,001 residents. This section provides a population forecast based on past growth, as well as data that support the forecast.

POPULATION FORECASTS

Table 4 presents a comparison of OEA population forecasts for Jefferson County for the period between 2005 and 2040. In 1997 the OEA issued an average annual growth rate (AAGR) forecast for Jefferson County of about 2.31%, which would result in a population increase of 26,357 people between 2005 and 2050. In 2004, the OEA revised the forecast downwards, to an average annual growth rate of 1.61%, for an increase of about 15,603 residents.

The 1997 OEA forecasts also assumed a declining rate of growth through the forecast period. The 2004 forecasts used varied rates when analyzed in five-year increments. The documentation for the OEA forecasts provides no explanation for the varying growth rate assumptions.

Table 4. Comparison of 1997 and 2004 Office of Economic Analysis forecasts for Jefferson County

Year	1997		2004	
	Pop	AAGR	Pop	AAGR
2005	21,468	--	20,491	--
2010	24,376	2.57%	22,168	1.59%
2015	27,530	2.46%	24,079	1.67%
2020	30,824	2.29%	26,065	1.60%
2025	34,435	2.24%	28,298	1.66%
2030	38,434	2.22%	30,831	1.73%
2035	42,882	2.21%	33,390	1.61%
2040	47,825	2.21%	36,094	1.57%
Population Change 2005 to 2025				
Population Increase	13,785		7,648	
Percent Change	66.8%		37.0%	
AAGR	2.46%		1.51%	
Population Change 2005 to 2040				
Population Increase	26,357		15,603	
Percent Change	122.8%		76.1%	
AAGR	2.31%		1.63%	

Source: Office of Economic Analysis

Table 5 presents an alternative population forecast for Jefferson County for the period 2006 to 2056. The forecast reaches a population of 38,404 by 2030 and 58,025 in 2056.

The assumed growth rates vary during the forecast period. The assumed growth rate is 3.2% annually between 2006 and 2011. This is the highest assumed rate for the planning period and is justified by recent development trends and the employment impact of the Deer Ridge Correctional Institution.

The assumed growth rate between 2011 and 2026 is 2.5%. This rate assumes some slowing of growth after the initial impact of the correctional facility, but assumes a higher sustained rate of growth than the 2004 OEA figures. This is justified by regional trends—Jefferson County will continue to see spillover growth impacts from development in Deschutes County.

The assumed growth rate between 2026 and 2056 is 1.6%. This assumed rate is generally consistent with the OEA assumptions for the later decades of the forecasting period.

Finally, the forecast in the last column of the table includes 2,100 inmates that will be housed at the Deer Ridge Correctional Institution. These 2,100 people will reside in group quarters. The adjustment assumes that the facility will begin housing prisoners in 2007, starting with 525 prisoners and gradually increasing to 2,100 prisoners by 2010. The adjustment results in a 2056 county population of 60,125.

Table 5. Jefferson County population forecast, 2006-2056

Year	Population	Annual Increase	Percent Change	Population with Deer Ridge Inmates
2005	20,600	--		20,600
2006	21,259	659	3.2%	21,259
2007	21,939	680	3.2%	22,464
2008	22,642	702	3.2%	23,692
2009	23,366	725	3.2%	24,941
2010	24,114	748	3.2%	26,214
2011	24,885	772	3.2%	26,985
2012	25,508	622	2.5%	27,608
2013	26,145	638	2.5%	28,245
2014	26,799	654	2.5%	28,899
2015	27,469	670	2.5%	29,569
2016	28,156	687	2.5%	30,256
2017	28,859	704	2.5%	30,959
2018	29,581	721	2.5%	31,681
2019	30,320	740	2.5%	32,420
2020	31,079	758	2.5%	33,179
2021	31,855	777	2.5%	33,955
2022	32,652	796	2.5%	34,752
2023	33,468	816	2.5%	35,568
2024	34,305	837	2.5%	36,405
2025	35,162	858	2.5%	37,262
2026	36,042	879	2.5%	38,142
2027	36,618	577	1.6%	38,718
2028	37,204	586	1.6%	39,304
2029	37,799	595	1.6%	39,899
2030	38,404	605	1.6%	40,504
2031	39,019	614	1.6%	41,119
2032	39,643	624	1.6%	41,743
2033	40,277	634	1.6%	42,377
2034	40,922	644	1.6%	43,022
2035	41,576	655	1.6%	43,676
2036	42,242	665	1.6%	44,342
2037	42,917	676	1.6%	45,017
2038	43,604	687	1.6%	45,704
2039	44,302	698	1.6%	46,402
2040	45,011	709	1.6%	47,111
2041	45,731	720	1.6%	47,831
2042	46,463	732	1.6%	48,563
2043	47,206	743	1.6%	49,306
2044	47,961	755	1.6%	50,061
2045	48,729	767	1.6%	50,829
2046	49,508	780	1.6%	51,608
2047	50,300	792	1.6%	52,400
2048	51,105	805	1.6%	53,205
2049	51,923	818	1.6%	54,023
2050	52,754	831	1.6%	54,854
2051	53,598	844	1.6%	55,698
2052	54,455	858	1.6%	56,555
2053	55,327	871	1.6%	57,427
2054	56,212	885	1.6%	58,312
2055	57,111	899	1.6%	59,211
2056	58,025	914	1.6%	60,125

FACTUAL BASE

The following sections provide factual evidence in support of the coordinated population forecast.

Population trends

Table 6 shows historical population trends in Jefferson County for the period between 1980 and 2005. The data show that Jefferson County either grew slowly or shrank during the 1980's, averaging about 0.5% growth annually. Jefferson County's population began growing faster in the 1990's, adding 5,333 people and averaging about 4% growth annually. Growth in the 1990's was sporadic, with greater growth some years than other years. Between 2000 and 2005, the County's population continues to grow sporadically but at a slower rate than in the 1990's.

All of the data in Table 6 is from the Population Research Center (PRC) at Portland State University, except for population estimates for 1990 and 2000, which are taken from the U.S. Census. The population estimates for 1990 and 2000 differ between the U.S. Census (conducted in April 1) and the PRC (conducted on July 1). The difference in population estimates between the Census and PRC for 1990 was 24 people and in 2000 was 141 people.

The Census count also provides a reasonable explanation for the large increases between 1989-90 and 1990-2000. It is probably the case that PSU systematically underestimated population in Jefferson County in the inter-census periods. PSU uses a July 1 date for its estimates; the Census uses an April 1 date. This allows PSU to make adjustments to estimates based on the Census count. Given the history of PSU's conservative population estimates for Jefferson County, and the large number of building permits that were issued in recent years, it is quite possible that the 2005 PSU estimate for the County is significantly low. The implication of a low estimate for the forecasting process is potentially substantial. An increase of even a few hundred people in the population base will make a big difference in future years since the forecasts use a compounding methodology.

Table 6. Jefferson County Population Data, 1980 to 2005

Year	Jefferson County Population	Annual Percent Change
1980	11,599	-----
1981	11,950	3.03%
1982	12,225	2.30%
1983	12,050	-1.43%
1984	12,200	1.24%
1985	12,150	-0.41%
1986	12,000	-1.23%
1987	11,800	-1.67%
1988	11,900	0.85%
1989	12,100	1.68%
1990	13,676	13.02%
1991	14,400	5.29%
1992	14,600	1.39%
1993	14,900	2.05%
1994	15,400	3.36%
1995	16,100	4.55%
1996	16,900	4.97%
1997	17,100	1.18%
1998	17,400	1.75%
1999	17,650	1.44%
2000	19,009	7.70%
2001	19,400	2.06%
2002	19,850	2.32%
2003	19,900	0.25%
2004	20,250	1.76%
2005	20,600	1.73%

Source: U.S. Census and Population Research Center at Portland State University

Table 7 shows growth rates for Jefferson County for several time periods. These historical growth rates provide context for developing a range of population projections. ECO calculated the rates using the compounding average annual growth rate method. The data underscore several key points:

- The start and end dates have a big impact on the growth rate. This is because population growth was slow in the 1980's, then spiked in the 1990's, and has slowed since 2000.
- The average annual growth rate (AAGR) is between 2.32% (1980-2005) and 2.77% (1990-2005) depending on the time period.

Table 7. Compound Growth Rates by Time Period, Jefferson County

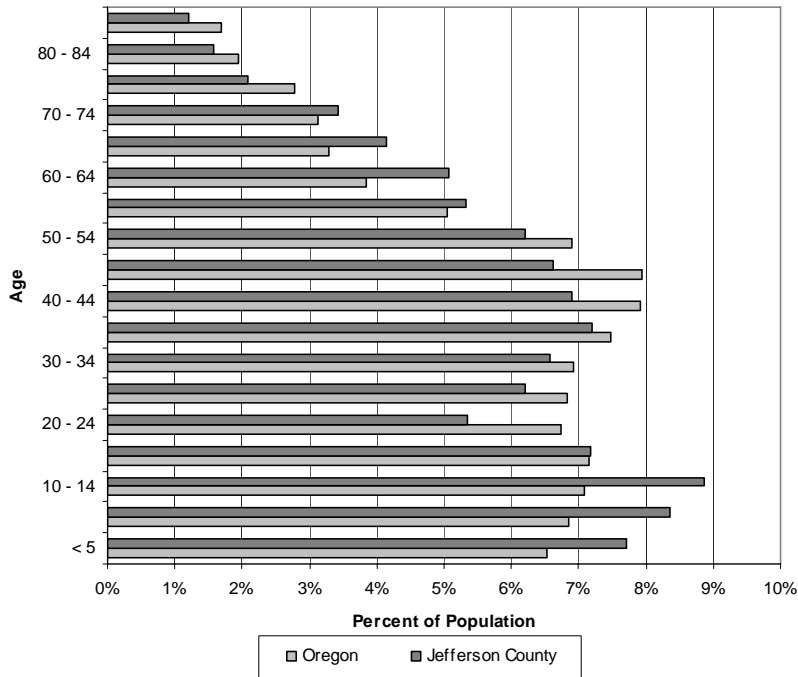
Period	Number of Years	AAGR		
		(Compound growth rate)	Population Increase	% Change (full period)
1980-2005	25	2.32%	9,001	78%
1985-2005	20	2.67%	8,450	70%
1990-2005	15	2.77%	6,924	51%
1995-2005	10	2.50%	4,500	28%
2000-2005	5	1.62%	1,591	8%

Socioeconomic trends

This section reviews historical socioeconomic trends in Jefferson County. Socioeconomic trends provide a broader context for growth; factors such as age, income, migration and other trends show how communities have grown and shape future growth. To provide context, we compare Jefferson County with Oregon. Characteristics such as age and race are indicators of how population has grown in the past and provide insight into factors that may affect future growth. Where relevant, Jefferson County is compared to Deschutes County since the forecasts assume growth trends in Deschutes County will impact Jefferson County (e.g., Jefferson County will experience spillover effects that will increase growth rates) during the forecasting period.

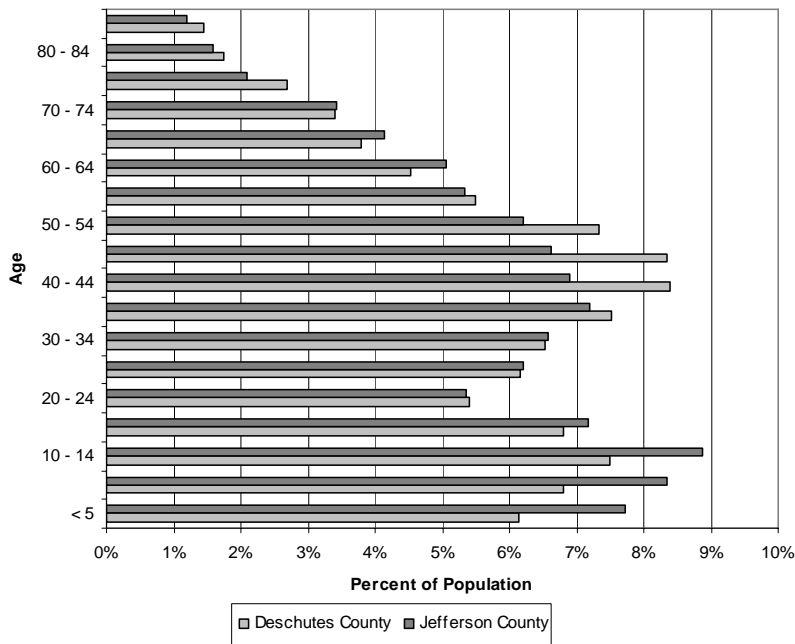
Figure 3 compares age in Jefferson County and Oregon for 2000. The data show that Jefferson County has a higher percentage of its population in the following age classes: 14 years and younger and 55 to 74 years old. These trends suggest that Jefferson County is attracting people who are retiring or soon to retire, as well as families with children. By contrast, Deschutes County, (shown in Figure 4), has a higher percentage than Jefferson County of population between 35 and 59 years old.

Figure 3. Age distribution, Jefferson County and Oregon, 2000



Source: U.S. Census, SF-1

Figure 4. Age distribution, Jefferson County and Deschutes County, 2000



Source: U.S. Census, SF-1

During the 1990's Jefferson County experienced changes in the age structure of its residents. Table 8 shows population by age for Jefferson County for 1990 and 2000. The Census data show that Jefferson County grew by 5,333 people between 1990 and 2000, which is a 29% increase. The age breakdown shows how Jefferson County grew. While the County experienced an increase in population for every age group, the fastest growing groups were 5 to 17 years and 45 to 64 years. The under 5 years, 18 to 24 years, and 25 to 44 years were the slowest growing groups.

Table 8. Population by Age, Jefferson County, 1990 and 2000

Age Group	1990		2000		Change		
	Number	Percent	Number	Percent	Number	Percent	Share
Under 5	1,393	10%	1,467	8%	74	76%	-2%
5-17	2,889	21%	4,199	22%	1,310	105%	1%
18-24	1,172	9%	1,455	8%	283	89%	-1%
25-44	3,991	29%	5,111	27%	1,120	92%	-2%
45-64	2,530	18%	4,414	23%	1,884	126%	5%
65 and over	1,701	12%	2,363	12%	662	100%	0%
Total	13,676	100%	19,009	100%	5,333	39%	0%

Source: U.S. Census, 1990 and 2000

The Census data suggest that Jefferson County is attracting older people and families with older children. This suggests that Jefferson County is attractive to families and retirees. This is probably due, at least in part, to the differential in housing costs between Jefferson and other central Oregon counties.

The U.S. Census collects information about migration patterns. Specifically, it asks households where their residence was in 1995 (5 years prior to the Census count). Table 9 shows place of residence in 1995 for Oregon and Jefferson County. The data show that residents of Jefferson County are equally mobile with other residents of Oregon. Less than half of residents in both Jefferson County or Oregon lived in the same residence in 1995 as in 2000. Twenty-four percent of Oregonians and 31% of Jefferson County residents lived in a different county in 1995; about 11% lived in a different state.

Table 9. Place of residence in 1995, Oregon and Jefferson County, persons 5 years and over

Location	Oregon		Jefferson County	
	Persons	Percent	Persons	Percent
Population 5 years and older	3,199,323	100%	17,610	100%
Same house in 1995	1,496,938	47%	8,007	45%
Different house in 1995	1,702,385	53%	9,603	55%
Same county	863,070	27%	3,976	23%
Different county	755,954	24%	5,450	31%
Same state	356,626	11%	3,520	20%
Different state	399,328	12%	1,930	11%

Source: U.S. Census, SF-3

Table 10 shows the number of persons of Hispanic or Latino origin for Jefferson County, Deschutes County, and Oregon for 1990 and 2000. The Census data show that Jefferson County has a larger proportion of Hispanic/Latino population than Deschutes County and Oregon. In 2000, Jefferson County's population was about 18% Hispanic/Latino residents, significantly higher than nearly 4% in Deschutes County and 8% for Oregon. Jefferson County's Hispanic/Latino population grew by 133% between 1990 and 2000. In summary, similar to statewide trends, the Hispanic/Latino population of Jefferson County is growing faster than the overall population. National demographic trends suggest this trend will continue in Jefferson County.

Table 10. Persons of Hispanic or Latino origin, Jefferson County, Deschutes County, and Oregon, 1990 and 2000

	Jefferson County	Deschutes County	Oregon
1990			
Total Population	13,676	74,958	2,842,321
Hispanic or Latino	1,448	1,526	112,707
Percent Hispanic or Latino	10.6%	2.0%	4.0%
2000			
Total Population	19,009	115,367	3,421,399
Hispanic or Latino	3,372	4,304	275,314
Percent Hispanic or Latino	17.7%	3.7%	8.0%
Change 1900-2000			
Hispanic or Latino	1,924	2,778	162,607
Percent Hispanic or Latino	133%	182%	144%

Source: U.S. Census, SF-1, 1990 and 2000

Table 11 shows the population of Jefferson County and Oregon in 2000, grouped by race. The data show that Jefferson County's population is more diverse than the population of Oregon. Most significantly Jefferson County's population is 17% Native American, while Native Americans comprise 2% of Oregon's entire population. The presence of the Warm Springs Reservation, which is partially located in Jefferson County, accounts for a large percentage of the

Native American population within the County. Jefferson County also has a greater proportion of people of "other" races than the entire population of Oregon.

Table 11. Population by Race, Jefferson County and Oregon, 2000

	Jefferson County		Oregon	
	Number	Percent	Number	Percent
Total persons	19,663	100%	3,534,208	100%
White alone or in combination with one or more other races	13,638	69%	3,055,670	86%
Black or African American alone or in combination with one or more other races	91	0%	72,647	2%
American Indian and Alaska Native alone or in combination with one or more other races	3,325	17%	85,667	2%
Some other race alone or in combination with one or more other races	2,609	13%	320,224	9%

Source: U.S. Census, SF-1, 2000

Aside from migration, population increase through natural means – births minus deaths. One way to estimate population growth among different groups of people is to examine their birth and death rates.

Table 12 shows the average birth and death rates (1999-2003) for people of different races in Jefferson County. Hispanic/Latinos and Native Americans, the most common minorities, have the highest birth rates. Whites have the lowest birth rates. Death rates are lower than birth rates for all groups, except whites. Whites and Native Americans have the highest death rates and Hispanic/Latinos have the lowest death rates. This data indicates that Native American and Hispanic/Latino populations are growing through natural causes (possibly in addition to migration) at a faster pace than other groups in the County.

Table 12. Average birth and death rates per 1,000 people for Jefferson County, 1999 to 2003

	Birth Rate	Death Rate
White, Non-Hispanic	9.38	10.74
African American or Black	18.80	2.38
Native American	28.87	8.82
Asian and Pacific Islander	13.90	3.85
Hispanic or Latino	29.36	1.44
Total	15.98	8.85

Source: Oregon Department of Human Services, 2005

SUMMARY OF FINDINGS

This section summarizes the findings in support of the alternative Jefferson County population forecast.

Jefferson County experienced substantial growth between 1980 and 2005.

- Jefferson County's population has increased at an average annual rate of 2.23% between 1980 and 2005. The total percentage increase in population was 78%, an increase of 9,001 residents.
- Jefferson County grew by an average annual of 3.35% between 1990 and 2000. This was considerably faster than Oregon's growth rate of 1.87% during the same period.

Development trends indicate that Jefferson County is likely to continue growing.

- Jefferson County's growth slowed in the early 2000's representing the national economic slow down, and has re-accelerated in 2004 and 2005. Factors affecting long-term growth in Jefferson County, such as housing values in Central Oregon and development trends, indicate that the County will continue growing quickly.
- Jefferson County's population will be affected by other development such as the Deer Ridge Correctional Institution, as well as continuing development of retirement and destination communities.
- The County approved 265 building permits for new residential units in 2005. This suggests that considerable demand exists for housing and that population growth rates will increase considerably in the short-term future.
- Jefferson County has lower overall housing prices than other areas of the region. This price differential will attract households at all income levels because they can get more housing for the money. It may have the affect of attracting more families and households that want to own a home but cannot afford the prices in other Central Oregon communities.

Jefferson County is attracting households with children.

- Jefferson County has a higher percentage of residents younger than 14 years than Oregon or Deschutes County.
- During the 1990's Jefferson County experienced changes in the age structure of its residents. While all age groups grew, the fastest growing age groups between 1990 and 2000 were people aged 5 to 17 and people aged 45 to 64. This indicates that families with older children may be moving to Jefferson County. One reason for this may be the lower cost of housing in Jefferson County. The slowest growing groups were residents less than 5 years old and residents between 25 to 44 years old.

Migration is an important component of Jefferson County's recent growth and will continue to be a key factor in population increases in Jefferson County through 2030.

- Only 45% of the residents of Jefferson County lived in the same house in 2000 as they did in 1995. Thirty-one percent of the County's residents lived in a different county in 1995 and 11% lived in a different state.
- The lower housing costs and proximity to Bend are likely to continue attracting people to Jefferson County. New development and employment, such as the Deer Ridge Correctional Institution, may attract new residents to the area.
- While it is difficult to forecast the actual migration rates, it is likely that migration will account for an increasing amount of population growth. According the 2004 PSU population report, about 50% of the population increase in Jefferson County between 2000 and 2004 was due to in migration. Nearly 90% of the population increase in Deschutes County during this period was due to in migration. This supports the assumption that in migration will play a greater role in Jefferson County in the future.

Jefferson County is becoming more ethnically diverse.

- Jefferson County's population is nearly 18% Hispanic/Latino, compared with 8% for Oregon and about 4% for Deschutes County. Jefferson County's Hispanic/Latino population increased by 133% between 1990 and 2000.

Several other factors justify a higher growth rate in the near term (2005-2026).

- With respect to housing, Madras is the least expensive community in Central Oregon. Lot prices are significantly lower in Madras; land is a significant contributor to overall housing prices. Development activity is increasing in Jefferson County—due in large part to more affordable housing. A proposed 1,700 unit master planned community in Madras provides evidence of this trend. This housing and land price differential will have a measurable impact on population increases in Jefferson County and its communities.
- Development proposals that are under review or have been approved suggest a lot of development is in the pipeline. For example, in March 2006 when this report was completed, Madras had over 3,000 single-family dwelling lots either platted or in process of submission for platting. Specifically, the east side development for Madras is planned for 1,700 units, plus commercial. A large Portland developer has submitted a proposal for 230 single-family dwelling units in Madras. These data suggest that Madras alone will average 70-75 new single-family dwellings in the 2007-2009 period and, more than 100 in the 2010-2020 period,
- The Community Impact Study indicates that the prison will result in 829 new households in the County. This equates to demand for 829 new housing units, 557 of which are estimated to be owner units and 272 rental units. The CIS estimates that the prison will have a direct population impact of 2,073 new persons in Jefferson County (not including inmates). These individuals would be on top of any baseline growth projection.

In summary, rapid employment growth near Madras from the correctional facility, combined with new housing opportunities that have very competitive pricing and options, suggests that growth rates in Jefferson County and its cities will occur in the near term (the next 10 years) at rates higher than recent historical averages. The above findings support the growth rate assumptions of 3.2% for 2006-2011, of 25% for 2011-2026 and of 1.6% for 2026-2056.

V. UNINCORPORATED JEFFERSON COUNTY POPULATION FORECAST

FORECAST TABLE

Table 13 presents the population forecast for unincorporated Jefferson County for the period 2006 to 2056. The forecast reaches a population 24,619 by 2056. The population forecast for unincorporated areas assumes that a significantly larger proportion of growth will occur within urban growth boundaries during the forecasting period.

The assumed rate declines throughout the forecast period consistent with assumed rates for the County and incorporated areas. Growth in unincorporated Jefferson County is assumed to grow at an annual rate of about 2.7% between 2006-11 and will decline to 0.5% annually by 2056.

Table 13. Unincorporated Jefferson County population forecast, 2005-2056

Year	Population	Annual Increase	Percent Change
2005	13,185	--	
2006	13,541	356	2.7%
2007	13,906	365	2.7%
2008	14,279	373	2.7%
2009	14,661	382	2.7%
2010	15,052	390	2.7%
2011	15,451	399	2.7%
2012	15,726	275	1.8%
2013	16,004	278	1.8%
2014	16,283	280	1.7%
2015	16,566	282	1.7%
2016	16,850	284	1.7%
2017	17,136	286	1.7%
2018	17,424	288	1.7%
2019	17,714	290	1.7%
2020	18,004	291	1.6%
2021	18,297	292	1.6%
2022	18,590	293	1.6%
2023	18,884	294	1.6%
2024	19,178	294	1.6%
2025	19,473	295	1.5%
2026	19,768	295	1.5%
2027	19,952	184	0.9%
2028	20,135	183	0.9%
2029	20,318	183	0.9%
2030	20,501	182	0.9%
2031	20,682	182	0.9%
2032	20,863	181	0.9%
2033	21,043	180	0.9%
2034	21,222	179	0.9%
2035	21,400	178	0.8%
2036	21,577	177	0.8%
2037	21,752	175	0.8%
2038	21,926	174	0.8%
2039	22,098	172	0.8%
2040	22,268	170	0.8%
2041	22,437	168	0.8%
2042	22,603	166	0.7%
2043	22,767	164	0.7%
2044	22,929	162	0.7%
2045	23,088	159	0.7%
2046	23,245	157	0.7%
2047	23,398	154	0.7%
2048	23,549	151	0.6%
2049	23,696	147	0.6%
2050	23,840	144	0.6%
2051	23,980	140	0.6%
2052	24,117	136	0.6%
2053	24,249	132	0.5%
2054	24,377	128	0.5%
2055	24,500	123	0.5%
2056	24,619	119	0.5%

FACTUAL BASE

Population Trends

Table 14 shows population estimates for the period between 1980 and 2005. The population of unincorporated Jefferson County grew by about 4,786 people during this period. Growth rates varied substantially by year over the period. The data show that the population of unincorporated Jefferson County shrank by 199 people during the 1980's, at an average rate of about -0.2% annually. Unincorporated Jefferson County's population began growing in the 1990's. Although growth in the 1990's was sporadic, unincorporated areas of the County added 1,807 people, an average of about 1.8% growth annually. Between 2000 and 2005, unincorporated areas of Jefferson County continued to grow, adding 691 people.

Table 14. Unincorporated Jefferson County Population, 1980 to 2005

Year	Unincorporated Jefferson County	Annual Percent Change
1980	8,399	-----
1981	8,690	3.46%
1982	8,925	2.70%
1983	8,850	-0.84%
1984	8,985	1.53%
1985	8,870	-1.28%
1986	8,685	-2.09%
1987	8,575	-1.27%
1988	8,615	0.47%
1989	8,200	-4.82%
1990	9,213	12.35%
1991	9,775	6.10%
1992	9,685	-0.92%
1993	9,735	0.52%
1994	9,880	1.49%
1995	10,080	2.02%
1996	10,695	6.10%
1997	10,630	-0.61%
1998	10,855	2.12%
1999	11,020	1.52%
2000	12,494	13.38%
2001	12,740	1.97%
2002	12,950	1.65%
2003	12,910	-0.31%
2004	13,180	2.09%
2005	13,185	0.04%

Source: U.S. Census and Population Research Center at Portland State University

The proportion of residents living in unincorporated Jefferson County compared with the three cities in the County decreased between 1980 and 2000. The greatest proportion of County residents lived in unincorporated areas of the County in 1984 (73.6%), decreasing to a low of 62.2% in 1997. In 2005, 64% of County residents lived in unincorporated areas of the County.

Table 15 shows growth rates for unincorporated Jefferson County for several time periods. The data underscore several key points:

- The start and end dates have a big impact on the growth rate. This is because population growth was negative in the 1980's, then grew in the 1990's, and has continued to grow since 2000.
- The average annual growth rate (AAGR) is between 1.08% (2000-2005) and 2.72% (1995-2005) depending on the time period.

Table 15. Compound Growth Rates by Time Period, Unincorporated Jefferson County

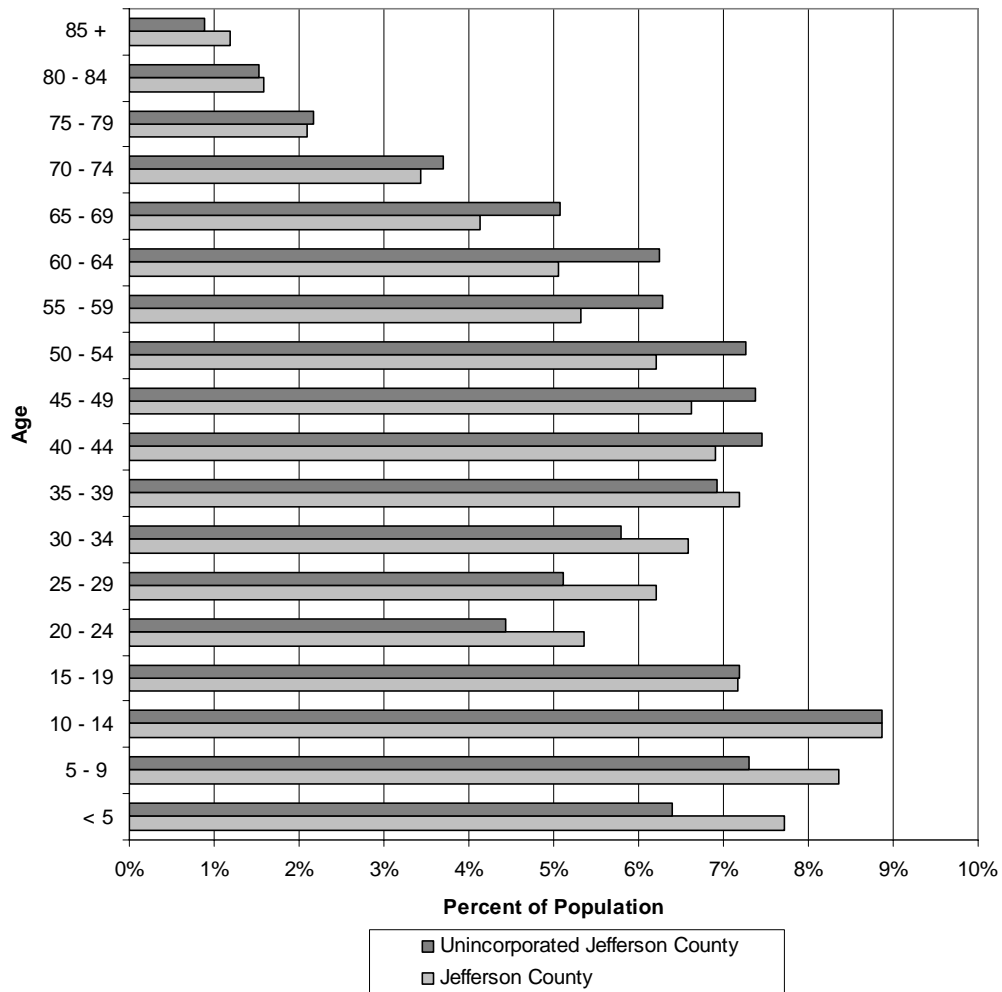
Period	Number of Years	AAGR (Compound growth rate)	Population Increase	% Change (full period)
1980-2005	25	1.82%	4,786	57%
1985-2005	20	2.00%	4,315	49%
1990-2005	15	2.42%	3,972	43%
1995-2005	10	2.72%	3,105	31%
2000-2005	5	1.08%	691	6%

Socioeconomic Trends

This section reviews historical socioeconomic trends in unincorporated Jefferson County. Socioeconomic trends provide a broader context for growth; factors such as age, income, migration and other trends show how communities have grown and shape future growth. To provide context, the findings compare unincorporated Jefferson County with Jefferson County. Characteristics such as age and race are indicators of how population has grown in the past and provide insight into factors that may affect future growth.

Figure 5 compares age in Jefferson County and Oregon for 2000. The data show that unincorporated Jefferson County has a higher percentage of its population in the 44 to 79 years age class. This trend suggests that unincorporated Jefferson County is attracting people who are retired or soon to retire.

Figure 5. Age distribution, Unincorporated Jefferson County and Jefferson County, 2000



Source: U.S. Census, SF-1

During the 1990's unincorporated Jefferson County experienced changes in the age structure of its residents. Table 16 shows population by age for Jefferson County for 1990 and 2000. The Census data show that unincorporated Jefferson County grew by 3,281 people between 1990 and 2000, which is a 36% increase. Unincorporated Jefferson County experienced growth in all age groups, except for people less than 5 years old. The age breakdown shows that unincorporated Jefferson County experienced the greatest increase in population for people 45 to 64 years and had the slowest growth in the following age groups: under 5 years, 18 to 24 years, and 24 to 44 years.

A comparison of population increase by age between unincorporated Jefferson County and Jefferson County shows that:

- Unincorporated Jefferson County grew slightly slower than Jefferson County. The population of unincorporated Jefferson County increased 36% between 1990 and 2000 while Jefferson County experienced a 39% increase.
- Unincorporated Jefferson County experienced higher growth in older age groups. Population in unincorporated Jefferson County grew at faster rates for all age groups over 45 years old. Jefferson County as a whole experienced higher growth rates for all age groups 44 years and younger.

The Census data suggest that unincorporated Jefferson County is attracting older individuals. This is probably due, at least in part, to affordable housing, climate, quality of life and other factors.

Table 16. Population by Age, Unincorporated Jefferson County, 1990 and 2000

Age Group	1990		2000		Change		
	Number	Percent	Number	Percent	Number	Percent	Share
Under 5	893	10%	800	6%	(93)	66%	-3%
5-17	1,976	21%	2,656	21%	680	99%	0%
18-24	704	8%	816	7%	112	85%	-1%
25-44	2,656	29%	3,158	25%	502	88%	-4%
45-64	1,873	20%	3,395	27%	1,522	134%	7%
65 and over	1,111	12%	1,669	13%	558	111%	1%
Total	9,213	100%	12,494	100%	3,281	36%	0%

Source: U.S. Census, 1990 and 2000

Table 17 shows the number of persons of Hispanic or Latino origin for unincorporated Jefferson County and Jefferson County for 1990 and 2000. The Census data show that unincorporated Jefferson County had a smaller proportion of Hispanic/Latino population than Jefferson County. In 2000, unincorporated Jefferson County's population was about 10% Hispanic/Latino, lower than 18% for Jefferson County. Unincorporated Jefferson County's Hispanic/Latino population grew by 114% between 1990 and 2000. In summary, similar to statewide trends, the Hispanic/Latino population of unincorporated Jefferson County is growing faster than the overall population. National demographic trends suggest this trend will continue in Jefferson County.

Table 17. Persons of Hispanic or Latino origin, Unincorporated Jefferson County and Jefferson County, 1990 and 2000

	Unincorporated Jefferson County	Jefferson County
1990		
Total Population	9,213	13,676
Hispanic or Latino	555	1,448
Percent Hispanic or Latino	6.0%	10.6%
2000		
Total Population	12,494	19,009
Hispanic or Latino	1,187	3,372
Percent Hispanic or Latino	9.5%	17.7%
Change 1900-2000		
Hispanic or Latino	632	1,924
Percent Hispanic or Latino	114%	133%

Source: U.S. Census, SF-1, 1990 and 2000

The County has a higher proportion of Native Americans than Oregon. The biggest reason for this is the presence of the Warm Springs Reservation straddling the northern border of Jefferson and Wasco County. Between 1990 and 2000, the population of the Warm Springs Reservation grew at an average annual growth rate of 0.7%, adding 283 people. In 2000, the population of the Warm Springs Reservation was 3,314 persons. If this rate of growth continues through 2030, population of the Warm Springs Reservation will increase by 679 people to 3,993 people.

SUMMARY OF FINDINGS

This section summarizes the findings in support of the alternative unincorporated Jefferson County population forecast.

Unincorporated Jefferson County has grown at a moderate pace since 1990.

- The total population increase in unincorporated Jefferson County between 1980 and 2005 was 4,786 residents. The total percentage increase in population from 1980 to 2005 was 57%. The AAGR between 1980 and 2005 was 1.82%. Between 1990 and 2005, the AAGR was 2.72% and the AAGR between 2000 and 2005 was 1.08%.
- Fifty-three percent of the population growth in Jefferson County between 1980 and 2005 took place in unincorporated areas of Jefferson County.
- A decreasing share of population growth is occurring in unincorporated areas of Jefferson County. In 1980, 72.4% of the County's population was in unincorporated areas; this decreased to 64% in 2005. The coordinated population forecast assumes a continuation of this trend with population in unincorporated areas accounting for 57% of the county's population in 2025, and about 46% by 2056. In summary, Jefferson County is, and will continue to become more urbanized.

Unincorporated Jefferson County is attracting older residents.

- Unincorporated Jefferson County has a higher percentage of its population in the 44 to 79 years age class than Jefferson County. This trend suggests that unincorporated Jefferson County is attracting people who are retired or soon to retire.
- Unincorporated Jefferson County experienced changes in age structure of its residents between 1990 and 2000. Unincorporated Jefferson County experienced growth in all age groups, except for people less than 5 years old. Unincorporated Jefferson County experienced the greatest increase in population for people 45 to 64 years.

Unincorporated Jefferson County continues to become more ethnically diverse.

- Unincorporated Jefferson County's Hispanic/Latino population grew by 114% between 1990 and 2000. Unincorporated areas of Jefferson County have a smaller proportion of Hispanic/Latino population than Jefferson County. In 2000, unincorporated Jefferson County's population was about 10% Hispanic/Latino, compared with 18% for Jefferson County.

The findings presented above support the assumed growth rates for unincorporated Jefferson County that start at 2.7% annually in the 2006-11 period and decrease to 0.7% by 2056.

VI. CULVER POPULATION FORECAST

FORECAST TABLE

Table 18 presents the population forecast for the City of Culver within the urban growth boundary (UGB) for the period 2005 to 2056. The forecast reaches a population 1,863 by 2026, and to 3,276 by 2056.

The assumed growth rate for Culver is 3.2% for the 2006-2011 period. This higher growth rate is predicated on recently approved subdivisions that will result in more than 150 new dwelling units over the next several years. The assumed growth rate for 2011-2026 is 2.8% annually—a rate that is consistent with population growth trends between 1980 and 2005. The assumed growth rate for 2026-2056 is 1.9% annually. This lower growth rate is consistent with lower assumed growth rates for other jurisdictions, the County, and assumed growth rates in the OEA long-term forecasts.

Table 18. Culver UGB population forecast, 2005-2030

Year	Population	Annual Increase	Percent Change
2005	1,019	--	
2006	1,052	33	3.2%
2007	1,085	34	3.2%
2008	1,120	35	3.2%
2009	1,156	36	3.2%
2010	1,193	37	3.2%
2011	1,231	38	3.2%
2012	1,265	34	2.8%
2013	1,301	35	2.8%
2014	1,337	36	2.8%
2015	1,375	37	2.8%
2016	1,413	38	2.8%
2017	1,453	40	2.8%
2018	1,493	41	2.8%
2019	1,535	42	2.8%
2020	1,578	43	2.8%
2021	1,622	44	2.8%
2022	1,668	45	2.8%
2023	1,715	47	2.8%
2024	1,763	48	2.8%
2025	1,812	49	2.8%
2026	1,863	51	2.8%
2027	1,899	36	1.9%
2028	1,936	37	1.9%
2029	1,974	38	1.9%
2030	2,012	38	1.9%
2031	2,051	39	1.9%
2032	2,091	40	1.9%
2033	2,132	41	1.9%
2034	2,174	42	1.9%
2035	2,216	42	1.9%
2036	2,259	43	1.9%
2037	2,303	44	1.9%
2038	2,348	45	1.9%
2039	2,394	46	1.9%
2040	2,440	47	1.9%
2041	2,488	48	1.9%
2042	2,536	48	1.9%
2043	2,586	49	1.9%
2044	2,636	50	1.9%
2045	2,687	51	1.9%
2046	2,740	52	1.9%
2047	2,793	53	1.9%
2048	2,848	54	1.9%
2049	2,903	55	1.9%
2050	2,960	57	1.9%
2051	3,017	58	1.9%
2052	3,076	59	1.9%
2053	3,136	60	1.9%
2054	3,197	61	1.9%
2055	3,259	62	1.9%
2056	3,323	63	1.9%

FACTUAL BASE

The following sections provide factual evidence in support of the coordinated population forecast.

Population Trends

Table 19 shows population estimates for Culver for the period between 1980 and 2005. The data show that Culver grew slowly during the 1980's, averaging about 0.6% growth annually and adding 26 people. Culver's population began growing faster in the 1990's, adding 265 people and averaging about 4% growth annually. Between 2000 and 2005, Culver's population continued to grow sporadically, but at a slower rate than in the 1990's. Between 2004 and 2005, Culver's population increased by 169 people, a 20% increase, as a result of approved development within the City.

Table 19. Culver City Limit Population Data, 1980 to 2005

Year	City of Culver	Annual Percent Change
1980	514	-----
1981	510	-0.78%
1982	510	0.00%
1983	500	-1.96%
1984	505	1.00%
1985	505	0.00%
1986	515	1.98%
1987	505	-1.94%
1988	520	2.97%
1989	540	3.85%
1990	570	5.56%
1991	595	4.39%
1992	625	5.04%
1993	640	2.40%
1994	660	3.13%
1995	715	8.33%
1996	795	11.19%
1997	835	5.03%
1998	850	1.80%
1999	835	-1.76%
2000	802	-3.95%
2001	800	-0.25%
2002	840	5.00%
2003	840	0.00%
2004	850	1.19%
2005	1,019	19.88%

Source: U.S. Census and Population Research Center at Portland State University

Table 20 shows growth rates for Culver for several time periods. These historical growth rates provide context for developing a range of population projections. ECO calculated the rates using the compounding method. The data underscore several key points:

- The start and end dates have a big impact on the growth rate. This is because population growth was slow in the 1980's, then spiked in the 1990's and 2005.
- The average annual growth rate (AAGR) was between 2.78% (1980-2005) and 4.91% (2000-2005) depending on the time period.

Table 20. Compound Growth Rates by Time Period, City of Culver

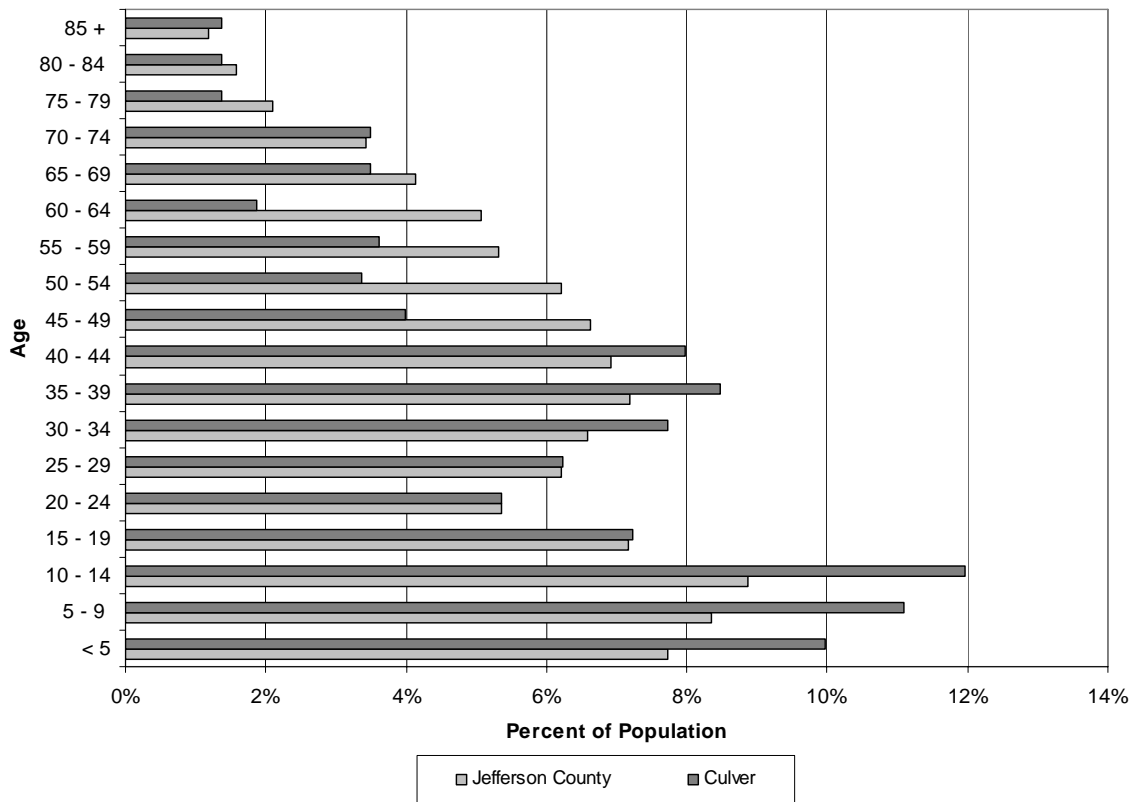
Period	Number of Years	AAGR		
		(Compound growth rate)	Population Increase	% Change (full period)
1980-2005	25	2.78%	505	98%
1985-2005	20	3.57%	514	102%
1990-2005	15	3.95%	449	79%
1995-2005	10	3.61%	304	43%
2000-2005	5	4.91%	217	27%

Socioeconomic Trends

This section reviews historical socioeconomic trends in the City of Culver. Socioeconomic trends provide a broader context for growth in a city; factors such as age, income, migration and other trends show how communities have grown and shape future growth. To provide context, the findings compare the City of Culver with Jefferson County. Characteristics such as age, household composition, and race are indicators of how population has grown in the past and provide insight into factors that may affect future growth.

Figure 6 compares age in the City of Culver and Jefferson County for 2000. The data show that Culver has a younger population than Jefferson County. Culver has a higher percentage of its population in the following age classes: 14 years and younger and 30 to 44 years old. Culver generally has a lower proportion of its population in the 45 to 84 age ranges. These trends suggest that Culver is attracting younger people, including families with children.

Figure 6. Age distribution, Culver and Jefferson County, 2000



Source: U.S. Census, SF-1

During the 1990's Culver experienced changes in the age structure of its residents. Table 21 shows population by age for Culver for 1990 and 2000. The Census data show that Culver grew by 232 people between 1990 and 2000, which is a 41% increase. Culver experienced an increase in population for every age group. The fastest growing groups were 5 to 17 years and 65 and over. The slowest growing groups were between 18 and 64 years.

A comparison of population increase by age between Culver and Jefferson County shows that:

- Culver grew at nearly the same pace as Jefferson County. The population of Culver increased by 41% between 1980 and 2000 and Jefferson County experienced a 39% population increase.
- Culver had a higher percentage increase in the youngest and oldest age groups. Culver had faster growth in people aged 17 and younger. Growth in this group accounted for more than half of the population increase between 1990 and 2000. Culver also experienced faster growth in people 65 years and older. However, this change may not be an indicator of future trends because it only included an increase of 34 individuals.

Table 21. Population by Age, City of Culver 1990 and 2000

Age Group	1990		2000		Change		
	Number	Percent	Number	Percent	Number	Percent	Share
Under 5	55	10%	80	10%	25	103%	0%
5-17	131	23%	227	28%	96	123%	5%
18-24	57	10%	59	7%	2	74%	-3%
25-44	182	32%	244	30%	62	95%	-2%
45-64	90	16%	103	13%	13	81%	-3%
65 and over	55	10%	89	11%	34	115%	1%
Total	570	100%	802	100%	232	41%	0%

Source: U.S. Census, 1990 and 2000

The U.S. Census collects information about migration patterns. Specifically, it asks households where their residence was in 1995 (5 years prior to the Census count). Table 22 shows place of residence in 1995 for Culver and Jefferson County. The data show that residents of Culver are more mobile than residents of Jefferson County. Thirty-eight percent of residents in Culver lived in the same residence in 1995, compared with 45% in Jefferson County. About one-third of residents in Jefferson County and Culver lived in a different county in 1995; about 15% of Culver residents lived in a different state in 1995.

Table 22. Place of residence in 1995, Jefferson County and Culver, persons 5 years and over

Location	Jefferson County		Culver	
	Persons	Percent	Persons	Percent
Population 5 years and older	17,610	100%	738	100%
Same house in 1995	8,007	45%	283	38%
Different house in 1995	9,603	55%	455	62%
Same county	3,976	23%	184	25%
Different county	5,450	31%	254	34%
Same state	3,520	20%	145	20%
Different state	1,930	11%	109	15%

Source: U.S. Census, SF-3

Table 23 shows the number of persons of Hispanic or Latino origin for Culver and Jefferson County for 1990 and 2000. The Census data show that Culver has a larger proportion of Hispanic/Latino population. In 2000, Culver's population was about 28% Hispanic/Latino, significantly higher than 18% in Jefferson County or 4% in Deschutes County. Culver's Hispanic/Latino population grew by 124% between 1990 and 2000. Culver's Hispanic/Latino population is growing faster than the overall population, which conforms to statewide trends. National demographic trends suggest this trend will continue in Culver.

**Table 23. Persons of Hispanic or Latino origin,
City of Culver and Jefferson County, 1990 and 2000**

	Culver	Jefferson County
1990		
Total Population	570	13,676
Hispanic or Latino	101	1,448
Percent Hispanic or Latino	17.7%	10.6%
2000		
Total Population	802	19,009
Hispanic or Latino	226	3,372
Percent Hispanic or Latino	28.2%	17.7%
Change 1900-2000		
Hispanic or Latino	125	1,924
Percent Hispanic or Latino	124%	133%

Source: U.S. Census, SF-1, 1990 and 2000

SUMMARY OF FINDINGS

This section summarizes the findings in support of the alternative Culver population forecast.

Culver has experienced fast population growth since 1990.

- Culver had a total of a 79% increase in population between 1990 and 2005. Between 1980 and 2005 the AAGR was 2.78%. The AAGR was 3.95% between 1990 and 2005. Culver had its most rapid growth between 2000 and 2005, with an AAGR of 4.91%.
- Between 1990 and 2005 Culver grew 1.9 times faster than Oregon and slightly faster than Jefferson County.
- Culver recently approved a major subdivision that still has significant development capacity and will continue to be built out through 2010. This finding justifies the higher growth rate assumption of 3.2% annually for the 2006-2011 period.

Culver is attracting families with children and retirees.

- Culver has a younger population than Jefferson County. Culver has a higher percentage of its population in the following age classes than Jefferson County: 14 years and younger and 30 to 44 years old. Culver generally has a lower proportion of its population than Jefferson County in the 45 to 84 age ranges. These trends suggest that Culver is attracting younger people, including families with children.
- Culver experienced changed in the age structure of its residents between 1990 and 2000. Culver had increases in population for every age group. The fastest growing groups were 5 to 17 years and 65 and over. The slowest growing groups were between 18 and 64 years. This suggests that families with children may be moving to Culver. It also suggests that Culver is attracting retirees.

In-migration accounts for some of the recent population growth.

- Thirty-eight percent of residents in Culver lived in the same residence in 1995, compared with 45% in Jefferson County. About one-third of residents in Jefferson County and Culver lived in a different county in 1995; about 15% of Culver residents lived in a different state in 1995.

Culver has more ethnic diversity than Jefferson County.

- In 2000, Culver's population was about 28% Hispanic/Latino, significantly higher than 18% in Jefferson County or 4% in Deschutes County. Culver's Hispanic/Latino population grew by 124% between 1990 and 2000.

The findings presented above support the assumed growth rate. The assumed rate of 3.2% annually for the 2006-2011 period is justified by recent development approvals. The assumed rate of 2.8% annually for the 2011-2026 is justifiable because it is consistent with growth rates experienced during the 1980-2005 period. The lower rate of 1.9% for the 2026-2056 period is justified by lower growth rate assumptions by OEA, and for other areas of the County during the forecasting period.

VII. MADRAS POPULATION FORECAST

FORECAST TABLE

Table 24 presents the population forecast for the City of Madras for the period 2005 to 2056. The forecast reaches a population 13,115 by 2026, and of 27,997 by 2056.

The assumed growth rate for the 2006-2011 period is 4.5% annually. This rate is based on Madras' growth between 1980 and 2005, recent development activity, and the impacts of the prison. The rate assumption is 4.0% annually for the 2011-2026 period. The assumed growth rate for the 2026-2056 period is 2.6% and is consistent with lower assumptions for the County during the later decades of the forecasting period.

Table 24. Madras UGB population forecast, 2005-2030

Year	Population	Annual Increase	Percent Change
2005	5,592	--	
2006	5,844	252	4.5%
2007	6,107	263	4.5%
2008	6,381	275	4.5%
2009	6,669	287	4.5%
2010	6,969	300	4.5%
2011	7,282	314	4.5%
2012	7,574	291	4.0%
2013	7,876	303	4.0%
2014	8,192	315	4.0%
2015	8,519	328	4.0%
2016	8,860	341	4.0%
2017	9,214	354	4.0%
2018	9,583	369	4.0%
2019	9,966	383	4.0%
2020	10,365	399	4.0%
2021	10,779	415	4.0%
2022	11,211	431	4.0%
2023	11,659	448	4.0%
2024	12,125	466	4.0%
2025	12,610	485	4.0%
2026	13,115	504	4.0%
2027	13,451	336	2.6%
2028	13,795	344	2.6%
2029	14,148	353	2.6%
2030	14,510	362	2.6%
2031	14,882	371	2.6%
2032	15,263	381	2.6%
2033	15,653	391	2.6%
2034	16,054	401	2.6%
2035	16,465	411	2.6%
2036	16,887	422	2.6%
2037	17,319	432	2.6%
2038	17,762	443	2.6%
2039	18,217	455	2.6%
2040	18,683	466	2.6%
2041	19,162	478	2.6%
2042	19,652	491	2.6%
2043	20,155	503	2.6%
2044	20,671	516	2.6%
2045	21,201	529	2.6%
2046	21,743	543	2.6%
2047	22,300	557	2.6%
2048	22,871	571	2.6%
2049	23,456	585	2.6%
2050	24,057	600	2.6%
2051	24,673	616	2.6%
2052	25,304	632	2.6%
2053	25,952	648	2.6%
2054	26,616	664	2.6%
2055	27,298	681	2.6%
2056	27,997	699	2.6%

FACTUAL BASE

The following sections provide factual evidence in support of the coordinated population forecast.

Population Trends

Table 25 shows population estimates for Madras for the period between 1980 and 2005. The data show that Madras grew slowly during the much of 1980's, with population decreases some years. The City averaged about 3% growth annually, adding 660 people during this period. Madras' population began growing rapidly in 1989 and continued growing through the 1990's. Madras added 1,637 people in the 1990's, averaging 4% growth annually. Madras' population has continued to grow since 2000.

Annexations account for a population increase of 681 people between 1980 and 2004. The majority of the growth in population resulting from annexation occurred in the 1980's. The largest annexation of 572 people took place in 1989, which explains the rapid growth in population in 1989.

Table 25. Madras City Limit Population, 1980 to 2005

Year	City of Madras	Annual Percent Change
1980	2,235	-----
1981	2,290	2.46%
1982	2,320	1.31%
1983	2,250	-3.02%
1984	2,260	0.44%
1985	2,320	2.65%
1986	2,340	0.86%
1987	2,270	-2.99%
1988	2,295	1.10%
1989	2,895	26.14%
1990	3,443	18.93%
1991	3,570	3.69%
1992	3,820	7.00%
1993	4,020	5.24%
1994	4,290	6.72%
1995	4,675	8.97%
1996	4,770	2.03%
1997	4,940	3.56%
1998	5,005	1.32%
1999	5,080	1.50%
2000	5,078	-0.04%
2001	5,200	2.40%
2002	5,290	1.73%
2003	5,370	1.51%
2004	5,430	1.12%
2005	5,592	2.98%

Source: U.S. Census and Population Research Center at Portland State University

The data in Table 25 includes only the population within the Madras UGB. The U.S. Census tracks the number of people within the city limits, as well as the population within the Madras urban cluster. According to the U.S. Census, an urban cluster is a densely settled territory that may or may not include a small incorporated city. In 2000, the Census estimated that there were 5,078 residents within the City of Madras and 7,252 people within the Madras urban cluster. The population living within Madras accounts for 70% of the population within the urban cluster. Although the forecast for Madras does not include this group of people, the coordinated forecast for Jefferson County does include growth in this population.

Table 26 shows growth rates for Madras for several time periods. These historical growth rates provide context for developing a range of population projections. ECO calculated the rates using the compounding method. The data underscore several key points:

- The start and end dates have a big impact on the growth rate. This is because population growth was slow in the 1980's, then spiked in 1989 and 1990 and continued more gradually since 1991 to the present.

- The average annual growth rate (AAGR) was between 1.95% (2000-2005) and 4.50% (1985-2005) depending on the time period.

Table 26. Compound Growth Rates by Time Period, City of Madras

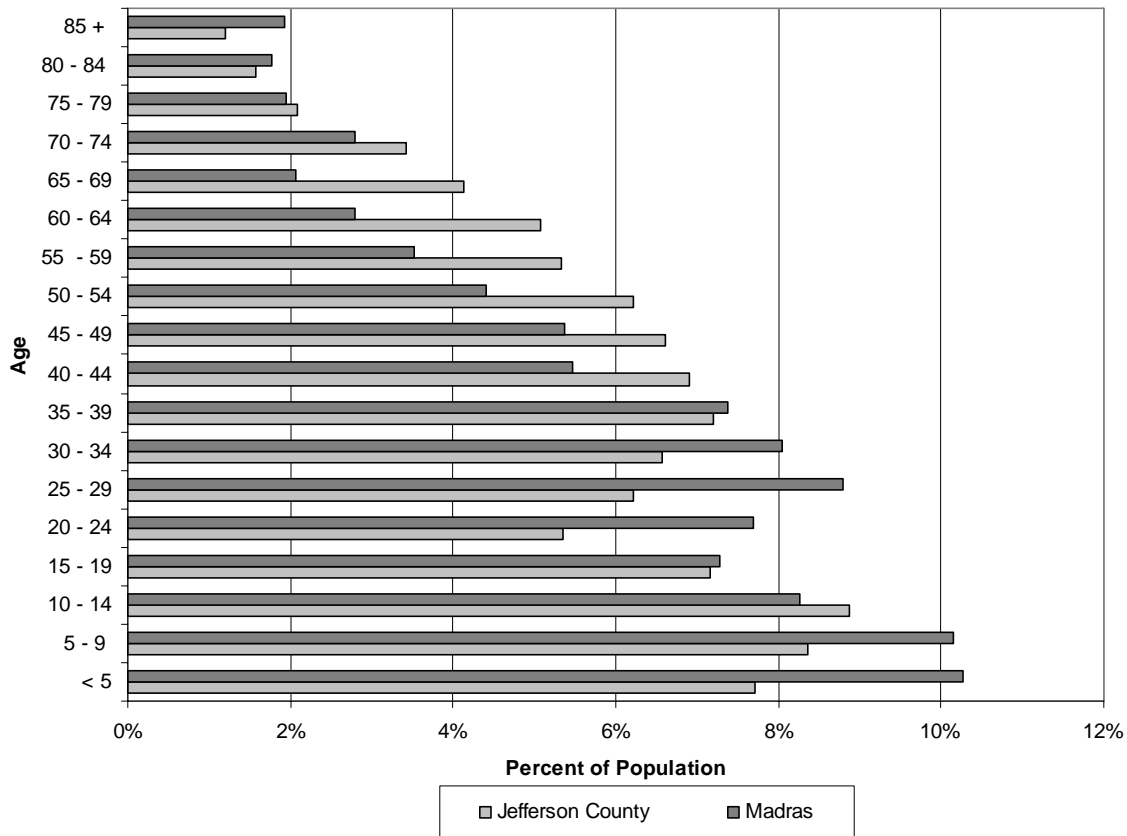
Period	Number of Years	AAGR (Compound growth rate)	Population Increase	% Change (full period)
1980-2005	25	3.74%	3,357	150%
1985-2005	20	4.50%	3,272	141%
1990-2005	15	3.29%	2,149	62%
1995-2005	10	1.81%	917	20%
2000-2005	5	1.95%	514	10%

Socioeconomic Trends

This section reviews historical socioeconomic trends in the City of Madras. Socioeconomic trends provide a broader context for growth in a city; factors such as age, income, migration and other trends show how communities have grown and shape future growth. To provide context, the findings compare the City of Madras with Jefferson County. Characteristics such as age, household composition, and race are indicators of how population has grown in the past and provide insight into factors that may affect future growth.

Figure 7 compares age in the City of Madras and Jefferson County for 2000. The data show that Madras has more young and old residents than Jefferson County. Madras has a higher percentage of its population in the following age classes: 39 years and younger and 80 years and older. Madras has a lower proportion of its population in the 40 to 79 age ranges. These trends suggest that Madras is attracting younger people, including families with children.

Figure 7. Age distribution, Madras and Jefferson County, 2000



Source: U.S. Census, SF-1

During the 1990's Madras experienced changes in the age structure of its residents. Table 27 shows population by age for Madras for 1990 and 2000. The Census data show that Madras grew by 1,635 people between 1990 and 2000, which is a 47% increase. Madras experienced an increase in population for every age group. The fastest growing groups were 5 to 17 years and 45 to 64 years. The slowest growing groups were under 5 years, as well as 65 years and over.

A comparison of population increase by age between Madras and Jefferson County shows that:

- Madras grew faster than Jefferson County. The population of Madras increased by 47% between 1980 and 2000 and Jefferson County experienced a 39% population increase.
- Madras had a higher percentage increase in all age groups younger than 44 years. Madras had proportionately slower growth in age groups older than 45 years.

Table 27. Population by Age, City of Madras 1990 and 2000

Age Group	1990		2000		Change		
	Number	Percent	Number	Percent	Number	Percent	Share
Under 5	395	11%	521	10%	126	89%	-1%
5-17	688	20%	1,158	23%	470	114%	3%
18-24	366	11%	538	11%	172	100%	0%
25-44	1,020	30%	1,509	30%	489	100%	0%
45-64	496	14%	818	16%	322	112%	2%
65 and over	478	14%	534	11%	56	76%	-3%
Total	3,443	100%	5,078	100%	1,635	47%	0%

Source: U.S. Census, 1990 and 2000

The U.S. Census collects information about migration patterns. Specifically, it asks households where their residence was in 1995 (5 years prior to the Census count). Table 28 shows place of residence in 1995 for Madras and Jefferson County. The data show that residents of Madras are more mobile than residents of Jefferson County. Thirty-five percent of residents in Madras lived in the same residence in 1995, compared with 45% in Jefferson County. About one-third of residents in Jefferson County and Madras lived in a different county in 1995; about 16% of Madras residents lived in a different state in 1995. These trends indicate that migration is an important factor in Madras' past growth.

Table 28. Place of residence in 1995, Jefferson County and Madras persons 5 years and over

Location	Jefferson County		Madras	
	Persons	Percent	Persons	Percent
Population 5 years and older	17,610	100%	4,537	100%
Same house in 1995	8,007	45%	1,589	35%
Different house in 1995	9,603	55%	2,948	65%
Same county	3,976	23%	1,475	33%
Different county	5,450	31%	1,389	31%
Same state	3,520	20%	684	15%
Different state	1,930	11%	705	16%

Source: U.S. Census, SF-3

Table 29 shows the number of persons of Hispanic or Latino origin for Madras and Jefferson County for 1990 and 2000. The Census data show that Madras has a larger proportion of Hispanic/Latino population. In 2000, Madras' population was about 36% Hispanic/Latino, significantly higher than 18% in Jefferson County or 4% in Deschutes County. Madras' Hispanic/Latino population grew by 146% between 1990 and 2000. Madras' Hispanic/Latino population is growing faster than the overall population, which conforms to statewide trends. National demographic trends suggest this trend will continue in Madras.

Table 29. Persons of Hispanic or Latino origin, City of Madras and Jefferson County, 1990 and 2000

	Madras	Jefferson County
1990		
Total Population	3,443	13,676
Hispanic or Latino	739	1,448
Percent Hispanic or Latino	21.5%	10.6%
2000		
Total Population	5,078	19,009
Hispanic or Latino	1,815	3,372
Percent Hispanic or Latino	35.7%	17.7%
Change 1900-2000		
Hispanic or Latino	1,076	1,924
Percent Hispanic or Latino	146%	133%

Source: U.S. Census, SF-1, 1990 and 2000

SUMMARY OF FINDINGS

This section summarizes the findings in support of the alternative Madras population forecast.

Madras has experienced substantial population growth since 1990.

- Madras had a total of a 150% increase in population between 1990 and 2005. Between 1980 and 2005 the AAGR was 3.74%. The AAGR was 3.29% between 1990 and 2005. Madras' population growth slowed between 2000 and 2005, with an AAGR of 1.95%.
- Between 1990 and 2005 Madras grew more than twice as fast as Oregon and slightly faster than Jefferson County.
- The assumed growth rate of 4.5% annually for the 2006-2026 period is based on historical growth rates, recent development activity, and the impacts of the prison.

Madras is attracting younger people, many of whom have children.

- Madras has more young and old residents than Jefferson County. Madras has a higher percentage of its population in the following age classes: 39 years and younger and 80 years and older. Madras has a lower proportion of its population in the 40 to 79 age ranges. These trends suggest that Madras is attracting younger people, including families with children.
- Madras experienced changes in the age structure of its residents between 1990 and 2000. Madras experienced an increase in population for every age group. The fastest growing groups were 5 to 17 years and 45 to 64 years. The slowest growing groups were under 5 years, as well as 65 years and over.

In-migration accounts for some of the recent population growth.

- Residents of Madras are more mobile than residents of Jefferson County. Thirty-five percent of residents in Madras lived in the same residence in 1995, compared with 45% in Jefferson County. About one-third of residents in Jefferson County and Madras lived in a different county in 1995; about 16% of Madras residents lived in a different state in 1995. These trends indicate that migration is an important factor in Madras' past growth.

Madras has the largest proportion of Hispanic/Latino residents in Jefferson County.

- In 2000, Madras' population was about 36% Hispanic/Latino, significantly higher than 18% in Jefferson County, 4% in Deschutes County, or 8% for Oregon. Madras' Hispanic/Latino population grew by 146% between 1990 and 2000.

Several other factors justify a higher growth rate in the near term (2005-2026).

- Madras is the least expensive housing market in Central Oregon. Lot prices are significantly lower in Madras; land is a significant contributor to overall housing prices. Development activity is increasing in Madras and Jefferson County—due in large part to more affordable housing. A proposed 1,700 unit master planned community in Madras provides evidence of this trend. This housing and land price differential will have a measurable impact on population increases in Jefferson County and its communities.
- Development proposals that are under review or have been approved suggest a lot of development is in the pipeline. For example, in March 2006 when this report was completed, Madras had over 3,000 single-family dwelling lots either platted or in process of submission for platting. Specifically, the east side development for Madras is planned for 1,700 units, plus commercial. A large Portland developer has submitted a proposal for 230 single-family dwelling units in Madras. These data suggest that Madras alone will average 70-75 new single-family dwellings annually in the 2007-2009 period and, more than 100 annually in the 2010-2020 period,
- The Community Impact Study estimates that the prison will have a direct population impact of 1,582 new persons in Madras. These individuals would be on top of any baseline growth projection.

In summary, rapid employment growth near Madras from the correctional facility, combined with new housing opportunities that have very competitive pricing and options, suggests that growth rates in Jefferson County and its cities will occur in the near term (the next 10 years) at rates higher than recent historical averages. The findings above support the assumed growth rate of 4.5% annually for the 2006-2011 period, of 4.0% for the 2011- 2026 period, and of 2.7% annually for the 2026-2056 period.

VIII. METOLIUS POPULATION FORECAST

FORECAST TABLE

Table 30 presents the population forecast for the City of Metolius for the period 2005 to 2056. The forecast reaches a population 1,296 by 2026, and 2,087 by 2056.

The assumed average annual growth rate for the 2006-2025 period is 2.3%. This is based on Metolius' historical growth between 1980 and 2005. The assumed rate is decreased to 1.6% annually during the 2026-2056 period consistent with assumptions used for the County and the other incorporated cities.

Table 30. Metolius UGB population forecast, 2005-2030

Year	Population	Annual Increase	Percent Change
2005	804	--	
2006	822	18	2.3%
2007	841	19	2.3%
2008	861	19	2.3%
2009	881	20	2.3%
2010	901	20	2.3%
2011	922	21	2.3%
2012	943	21	2.3%
2013	964	22	2.3%
2014	987	22	2.3%
2015	1,009	23	2.3%
2016	1,032	23	2.3%
2017	1,056	24	2.3%
2018	1,081	24	2.3%
2019	1,105	25	2.3%
2020	1,131	25	2.3%
2021	1,157	26	2.3%
2022	1,183	27	2.3%
2023	1,211	27	2.3%
2024	1,238	28	2.3%
2025	1,267	28	2.3%
2026	1,296	29	2.3%
2027	1,317	21	1.6%
2028	1,338	21	1.6%
2029	1,359	21	1.6%
2030	1,381	22	1.6%
2031	1,403	22	1.6%
2032	1,426	22	1.6%
2033	1,448	23	1.6%
2034	1,472	23	1.6%
2035	1,495	24	1.6%
2036	1,519	24	1.6%
2037	1,543	24	1.6%
2038	1,568	25	1.6%
2039	1,593	25	1.6%
2040	1,619	25	1.6%
2041	1,645	26	1.6%
2042	1,671	26	1.6%
2043	1,698	27	1.6%
2044	1,725	27	1.6%
2045	1,752	28	1.6%
2046	1,780	28	1.6%
2047	1,809	28	1.6%
2048	1,838	29	1.6%
2049	1,867	29	1.6%
2050	1,897	30	1.6%
2051	1,927	30	1.6%
2052	1,958	31	1.6%
2053	1,990	31	1.6%
2054	2,021	32	1.6%
2055	2,054	32	1.6%
2056	2,087	33	1.6%

FACTUAL BASE

The following sections provide factual evidence in support of the coordinated population forecast.

Population Trends

Table 31 shows population estimates for Metolius for the period between 1980 and 2005. Throughout the period, Metolius experienced years of comparatively rapid growth, as well as shrinking population in other years. The data show that Metolius grew slowly or shrank during the 1980's, averaging about 0.4% growth annually and adding 14 people. Metolius' population began growing in the 1990's, with notably rapid growth in 1994 and 1995. Metolius added 265 people in the 1990's, averaging nearly 5% growth annually. Metolius' population has continued to grow since 2000.

Table 31. Metolius City Limit Population, 1980 to 2005

Year	City of Metolius	Annual Percent Change
1980	451	-----
1981	460	2.00%
1982	470	2.17%
1983	450	-4.26%
1984	450	0.00%
1985	455	1.11%
1986	460	1.10%
1987	450	-2.17%
1988	470	4.44%
1989	465	-1.06%
1990	450	-3.23%
1991	460	2.22%
1992	470	2.17%
1993	505	7.45%
1994	570	12.87%
1995	630	10.53%
1996	640	1.59%
1997	695	8.59%
1998	690	-0.72%
1999	715	3.62%
2000	635	-11.19%
2001	660	3.94%
2002	770	16.67%
2003	780	1.30%
2004	790	1.28%
2005	804	1.77%

Source: U.S. Census and Population Research Center at Portland State University

Table 32 shows growth rates for Metolius for several time periods. These historical growth rates provide context for developing a range of population projections. ECO calculated the rates using the compounding method. The data underscore several key points:

- The start and end dates have a big impact on the growth rate. This is because population growth was slow in the 1980's, increasing in the early 1990s, spiking in the mid-1990's and continuing since 2000.
- The average annual growth rate (AAGR) was between 2.34% (1980-2005) and 4.83% (1990-2005) depending on the time period.

Table 32. Compound Growth Rates by Time Period, City of Metolius

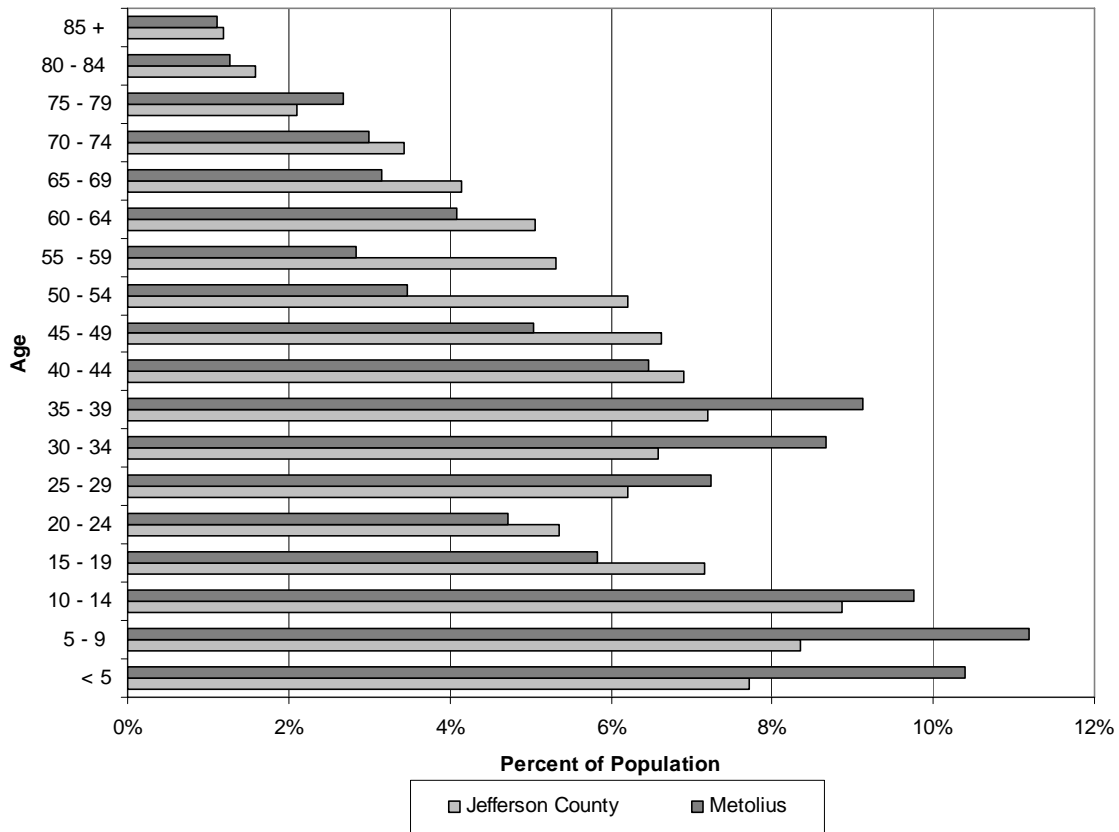
Period	Number of Years	AAGR		
		(Compound growth rate)	Population Increase	% Change (full period)
1980-2005	25	2.34%	353	78%
1985-2005	20	2.89%	349	77%
1990-2005	15	3.94%	354	79%
1995-2005	10	2.47%	174	28%
2000-2005	5	4.83%	169	27%

Socioeconomic Trends

This section reviews historical socioeconomic trends in the City of Metolius. Socioeconomic trends provide a broader context for growth in a city; factors such as age, income, migration and other trends show how communities have grown and shape future growth. To provide context, we compare the City of Metolius with Jefferson County. Characteristics such as age, household composition, and race are indicators of how population has grown in the past and provide insight into factors that may affect future growth.

Figure 8 compares age in the City of Metolius and Jefferson County for 2000. The data show that Metolius has more young and old residents than Jefferson County. Metolius has a higher percentage of its population in the following age classes: 39 years and younger. Metolius has a lower proportion of its population in the 40 and older age ranges, except for people 75-79 years. These trends suggest that Metolius is attracting younger people, including families with children.

Figure 8. Age distribution, Metolius and Jefferson County, 2000



Source: U.S. Census, SF-1

During the 1990's Metolius experienced changes in the age structure of its residents. Table 33 shows population by age for Metolius for 1990 and 2000. The Census data show that Metolius grew by 185 people between 1990 and 2000, which is a 41% increase. Metolius experienced an increase in population for every age group. The fastest growing groups were 5 to 17 years and 25 to 44 years. The slowest growing groups were under 5 years, 18 to 24 years, and 65 years and older.

Table 33. Population by Age, City of Metolius, 1990 and 2000

Age Group	1990		2000		Change		
	Number	Percent	Number	Percent	Number	Percent	Share
Under 5	50	11%	66	10%	16	94%	-1%
5-17	94	21%	158	25%	64	119%	4%
18-24	45	10%	42	7%	(3)	66%	-3%
25-44	133	30%	200	31%	67	107%	2%
45-64	71	16%	98	15%	27	98%	0%
65 and over	57	13%	71	11%	14	88%	-1%
Total	450	100%	635	100%	185	41%	0%

Source: U.S. Census, 1990 and 2000

The U.S. Census collects information about migration patterns. Specifically, it asks households where their residence was in 1995 (5 years prior to the Census count). Table 34 shows place of residence in 1995 for Metolius and Jefferson County. The data show that residents of Metolius are more mobile than residents of Jefferson County. Forty percent of residents in Metolius lived in the same residence in 1995, compared with 45% in Jefferson County. About 30% of residents in Jefferson County and Metolius lived in a different county in 1995; 12% of Metolius residents lived in a different state in 1995.

Table 34. Place of residence in 1995, Jefferson County and Metolius persons 5 years and over

Location	Jefferson County		Metolius	
	Persons	Percent	Persons	Percent
Population 5 years and older	17,610	100%	547	100%
Same house in 1995	8,007	45%	221	40%
Different house in 1995	9,603	55%	326	60%
Same county	3,976	23%	154	28%
Different county	5,450	31%	159	29%
Same state	3,520	20%	88	16%
Different state	1,930	11%	71	13%

Source: U.S. Census, SF-3

Table 35 shows the number of persons of Hispanic or Latino origin for Metolius and Jefferson County for 1990 and 2000. The Census data show that Metolius has a larger proportion of Hispanic/Latino population. In 2000, Metolius' population was about 23% Hispanic/Latino, significantly higher than 18% in Jefferson County or 4% in Deschutes County. Metolius' Hispanic/Latino population grew by 172% between 1990 and 2000. Metolius' Hispanic/Latino population is growing faster than the overall population, which conforms to statewide trends. National demographic trends suggest this trend will continue in Metolius.

Table 35. Persons of Hispanic or Latino origin, City of Metolius and Jefferson County, 1990 and 2000

	Metolius	Jefferson County
1990		
Total Population	450	13,676
Hispanic or Latino	53	1,448
Percent Hispanic or Latino	11.8%	10.6%
2000		
Total Population	635	19,009
Hispanic or Latino	144	3,372
Percent Hispanic or Latino	22.7%	17.7%
Change 1900-2000		
Hispanic or Latino	91	1,924
Percent Hispanic or Latino	172%	133%

Source: U.S. Census, SF-1, 1990 and 2000

SUMMARY OF FINDINGS

This section summarizes the findings in support of the alternative Metolius population forecast.

Metolius has experienced population growth since 1990.

- Metolius had a total of a 78% increase in population between 1990 and 2005. Between 1980 and 2005 the AAGR was 2.34%. The AAGR was 3.94% between 1990 and 2005. Metolius' population growth slowed between 2000 and 2005, with an AAGR of 4.83%.
- Between 1990 and 2005 Metolius grew 1.9 times faster than Oregon and slightly faster than Jefferson County.
- The assumed average annual growth rate of 2.3% for the 2006-2026 period is consistent with historical growth rates between 1980 and 2005 and is therefore justifiable.

Metolius is attracting younger people, many of whom have children.

- Metolius has a higher percentage of its population in the following age classes: 39 years and younger. Metolius has a lower proportion of its population in the 40 and older age ranges, except for people 75-79 years. These trends suggest that Metolius is attracting younger people, including families with children.
- Metolius experienced changes in the age structure of its residents between 1990 and 2000. Metolius experienced an increase in population for every age group. The fastest growing groups were 5 to 17 years and 25 to 44 years. The slowest growing groups were under 5 years, 18 to 24 years, and 65 years and older.

In-migration accounts for some of the recent population growth.

- Forty percent of residents in Metolius lived in the same residence in 1995, compared with 45% in Jefferson County. About 30% of residents in Jefferson County and Metolius lived

in a different county in 1995; 12% of Metolius residents lived in a different state in 1995. These trends indicate that migration is an important factor in Metolius' past growth.

Metolius has the fastest growing population of Hispanic/Latino residents in Jefferson County.

- In 2000, Metolius' population was about 23% Hispanic/Latino, significantly higher than 18% in Jefferson County or 4% in Deschutes County. Metolius' Hispanic/Latino population grew by 172% between 1990 and 2000.

The findings above justify the assumed average annual growth rate of 2.3% for the 2006-2026 period, and of 1.6% annually for the 2026-2056 period. The lower growth rate in the later part of the forecasting period is consistent with assumed rates for Jefferson County and other incorporated cities.