

Nevada State Water Plan
PART 2 — WATER USE AND FORECASTS

Section 2
Socioeconomic Assessment and Forecasts

Introduction

This section of the *Nevada State Water Plan* presents population, demographic and economic conditions and trends for the Nevada economy and provides individual county and statewide population and socioeconomic forecasts. In Part 2, Section 3 of the water plan, these demographic forecasts, particularly as they related to population and employment, are used to predict future water needs over a planning horizon extending through the year 2020. More specifically, population forecasts and their relationship to total employment comprise the foundation of the forecasts for municipal and industrial (M&I), domestic (residential), and commercial and industrial water withdrawals as well as M&I public use and losses.

Population forecasts for each Nevada county and the total state are contained in Appendix 2 of the Appendices of the water plan. Appendix 3 of the Appendices presents the employment forecasts, which are derived from population forecasts, and also contains specific water use coefficients in either gallons per person or per worker per day to forecast each county's M&I, domestic (residential) and commercial and industrial water use. County forecasts for these measures are aggregated for the statewide total. Tables showing individual county population, employment and water withdrawal estimates and projects are contained in this appendix. Other categories of water withdrawals, namely thermoelectric (including geothermal), mining (including both consumptive and non-consumptive uses, such as mine dewatering), irrigation and livestock (total agriculture), are forecast using methods unique to each of these sectors as explained in Part 2, Section 3, Water Use Assessment and Forecasts.

Population and Demographic Trends

Nevada's population is expected to continue to become increasingly concentrated in its primary urban areas of Las Vegas (Clark County), Reno-Sparks (Washoe County) and Carson City. This increasing level of urbanization will have varied spillover effects on neighboring counties, e.g., Nye County for Clark County, and Churchill, Douglas, Lyon, and Storey counties for Washoe County and Carson City. Population forecasts incorporated into this plan for Clark and Washoe counties were provided by the Clark County Department of Comprehensive Planning and the Washoe County Department of Community Development, respectively. The population forecasts for Washoe County were slightly modified by the Nevada Division of Water Planning (NDWP) to smooth the intervening period forecasts, matching Washoe County's population forecast for the year 2020. Other county

population forecasts were developed by the NDWP in conjunction with county inputs and were based on an extension and moderation of recent historical growth trends and the incorporation of estimated industrial development and employment forecasts based on inputs provided by the Nevada Department of Employment, Training and Rehabilitation (DETR).

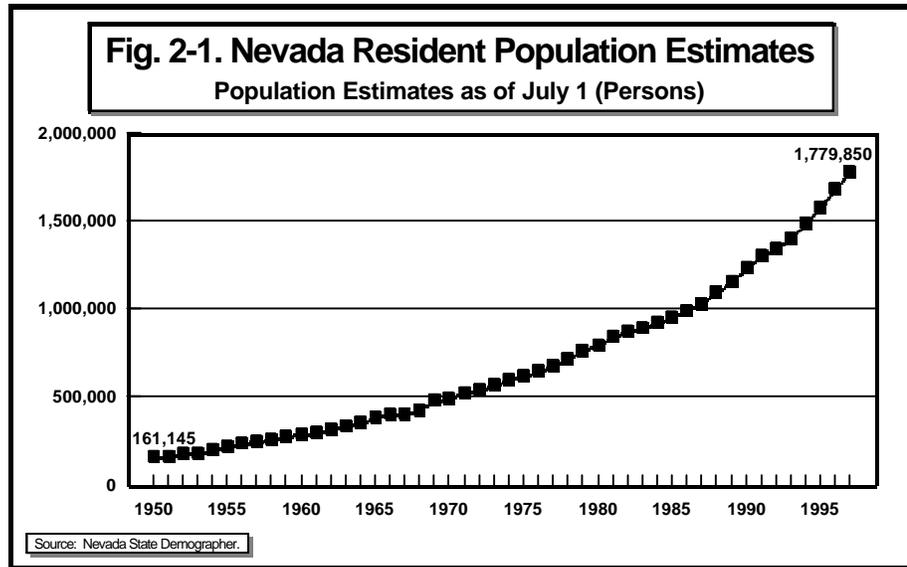


Fig. 2–1. Nevada Population Estimates, and Fig. 2–2. Nevada Population Growth Rates show annual population trends from 1950 through 1997. From Fig. 2–1, one can see the more recent acceleration of growth occurring since 1990 with the arrival of the first mega-resort casino in the Las Vegas gaming market. Table 2–1. Nevada Population Share Analysis — 1950–1997, presents historical and forecasted populations and population shares (in terms of county shares of the state’s total population) for Nevada and its seventeen counties at ten-year intervals from 1950 to 1997. This table shows that in 1997, Clark County’s total resident population was estimated at 1,192,200 persons and accounted for nearly 67.0 percent of the state’s total population. This represented an increase of 36.7 percentage points in Clark County’s share of the state’s total population since 1950.

Also from Table 2–1, Washoe County’s population was estimated at 308,700 persons in 1997, accounting for 17.3 percent of Nevada’s total population, a decline of 14.0 percentage points in its share of statewide population since 1950. Carson City’s population of 50,410 persons in 1997 comprised 2.8 percent of the state’s total population, an increase of just over 0.2 percentage point in its population share since 1950. Together, these three Nevada urban areas accounted for 87.2 percent of the state’s total population in 1997. Elko County, representing the other principal population center in Nevada, had an estimated population of 47,710 persons in 1997, accounting for 2.7 percent of the state’s population and representing a decline of 4.6 percent points in state population share since 1950.

Table 2–1 also shows that the combined population share of the state’s principal urban areas of Clark County, Washoe County and Carson City increased from 64.2 percent in 1950 to 87.2 percent of the state’s total population in 1997. This represents an increase of 23.0 percentage points in these area’s share of statewide total population from 1950 to 1997. The gain in population share from 1950 to 1997 was due entirely to the rapid growth in Clark County as Carson City showed virtually no change in its population share over the 1950-1997 time period and Washoe County actually lost 14.0 percentage points in its share of the state’s total population from 1950 to 1997.

Table 2–1. Nevada Population Share Analysis — 1950–1997
Shares Based on Percent of Total State Population (Persons/Percent of Total State)

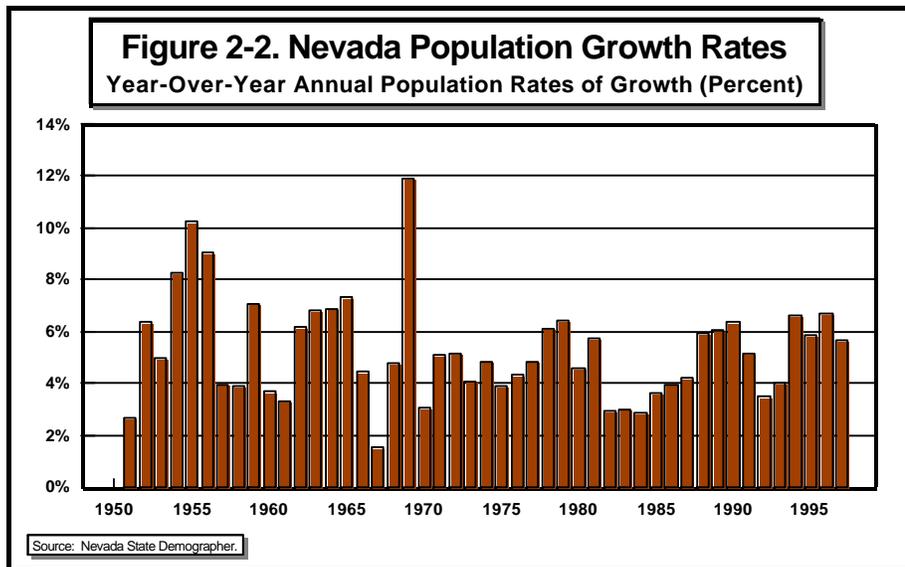
State/County	1950	1960	1970	1980	1990	1997
NEVADA	161,145	287,660	494,990	800,508	1,236,130	1,779,850
Carson City	4,198	8,020	16,054	32,022	40,950	50,410
Statewide Share	2.61%	2.79%	3.24%	4.00%	3.31%	2.83%
Churchill County	6,188	8,505	10,650	13,917	18,100	23,860
Statewide Share	3.84%	2.96%	2.15%	1.74%	1.46%	1.34%
Clark County	48,811	128,734	277,230	463,087	770,280	1,192,200
Statewide Share	30.29%	44.75%	56.01%	57.85%	62.31%	66.98%
Douglas County	2,023	3,575	7,067	19,421	28,070	39,590
Statewide Share	1.26%	1.24%	1.43%	2.43%	2.27%	2.22%
Elko County	11,703	12,051	13,946	17,269	33,770	47,710
Statewide Share	7.26%	4.19%	2.82%	2.16%	2.73%	2.68%
Esmeralda County	611	634	623	777	1,350	1,460
Statewide Share	0.38%	0.22%	0.13%	0.10%	0.11%	0.08%
Eureka County	897	775	938	1,198	1,550	1,660
Statewide Share	0.56%	0.27%	0.19%	0.15%	0.13%	0.09%
Humboldt County	4,870	5,723	6,380	9,449	13,020	17,520
Statewide Share	3.02%	1.99%	1.29%	1.18%	1.05%	0.98%
Lander County	1,860	1,580	2,653	4,076	6,340	7,030
Statewide Share	1.15%	0.55%	0.54%	0.51%	0.51%	0.39%
Lincoln County	3,850	2,378	2,526	3,732	3,810	4,110
Statewide Share	2.39%	0.83%	0.51%	0.47%	0.31%	0.23%
Lyon County	3,703	6,245	8,437	13,594	20,590	30,370
Statewide Share	2.30%	2.17%	1.70%	1.70%	1.67%	1.71%
Mineral County	5,588	6,329	6,961	6,217	6,470	6,860
Statewide Share	3.47%	2.20%	1.41%	0.78%	0.52%	0.39%
Nye County	3,101	4,642	5,459	9,048	18,190	27,610
Statewide Share	1.92%	1.61%	1.10%	1.13%	1.47%	1.55%
Pershing County	3,122	3,178	2,656	3,408	4,550	6,600
Statewide Share	1.94%	1.10%	0.54%	0.43%	0.37%	0.37%
Storey County	657	571	696	1,503	2,560	3,520
Statewide Share	0.41%	0.20%	0.14%	0.19%	0.21%	0.20%
Washoe County	50,484	84,988	122,574	193,623	257,120	308,700
Statewide Share	31.33%	29.54%	24.76%	24.19%	20.80%	17.34%
White Pine County	9,479	9,732	10,140	8,167	9,410	10,640
Statewide Share	5.88%	3.38%	2.05%	1.02%	0.76%	0.60%

Note: County population shares are based on a percentage of the statewide total population.

Source Data: Nevada State Demographer.

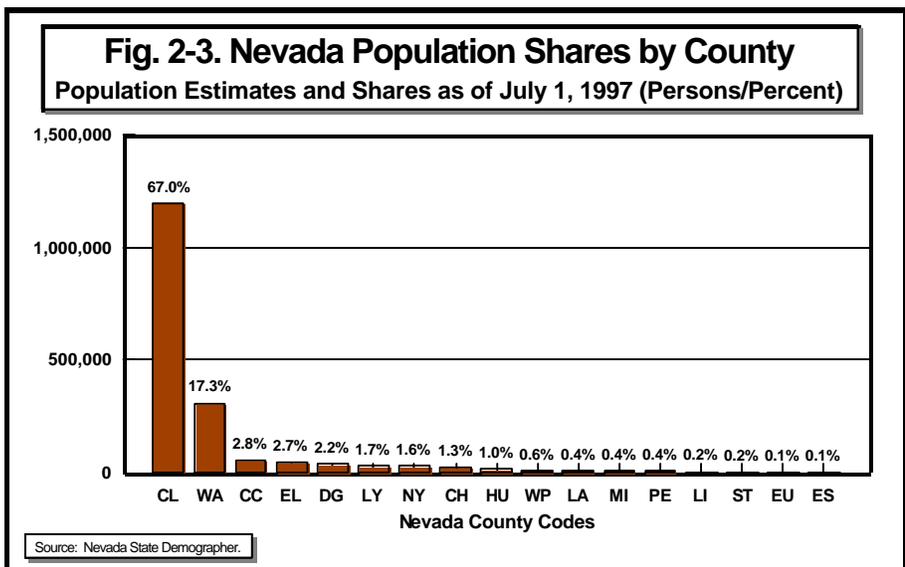
The population share trends presented in Table 2–1 indicate that while virtually every rural county in Nevada (i.e., all counties excluding Clark, Washoe and Carson City), has grown in its total resident population, they have declined in terms of their shares of statewide population between 1950

and 1997. The only exception to this has been Douglas County, where population trends have been strongly influenced by the county's increasing status as a "bedroom" community for neighboring Carson City. Unique population trends exist for other Nevada counties as well. For example, rapid population growth in Elko County has been

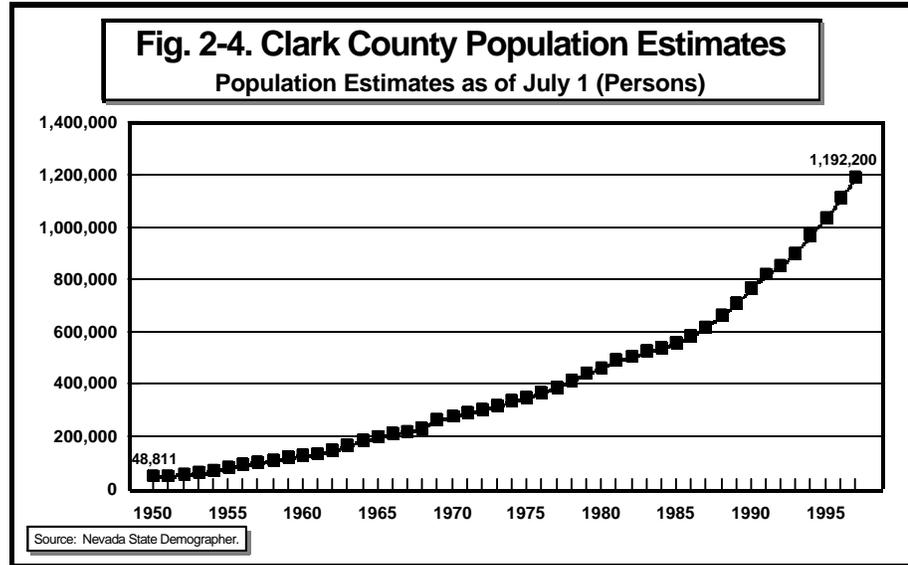


due in large part to trends in the mining industry, especially since the late 1980's. Between 1950 and 1970, Elko County's population grew by only 2,243 persons. However, over the next 27 years its population grew by nearly 30,000 persons. Much of this growth was due to mining, both in Elko County and neighboring Eureka County. Lyon County represents another county where growth in neighboring Carson City, primarily, has affected its population growth. Similarly, recent rapid growth in Nye County has been primarily centered in the southern part of the county at Pahrump, which has been influenced by rapid growth in nearby Las Vegas.

Gaming and Tourism. Casino gaming and tourism in Nevada represent the primary "driving" economic force most affecting the state's overall population trends. While growth in tourism and gaming win (revenues) has more recently slowed in the state's principal northern Nevada casino gaming markets of Reno-Sparks (Washoe County) and South Lake Tahoe (Douglas County), this trend has been more than off-set by high rates of growth in the southern Nevada gaming market of Las Vegas (Clark County), and specifically by trends within the Las Vegas Strip gaming sub-market, which alone accounts for nearly 50 percent of the state's total gaming win. The introduction of the mega-resort complex to the Las Vegas Strip gaming market beginning in late 1989 established a trend of rapid employment growth, population expansion,

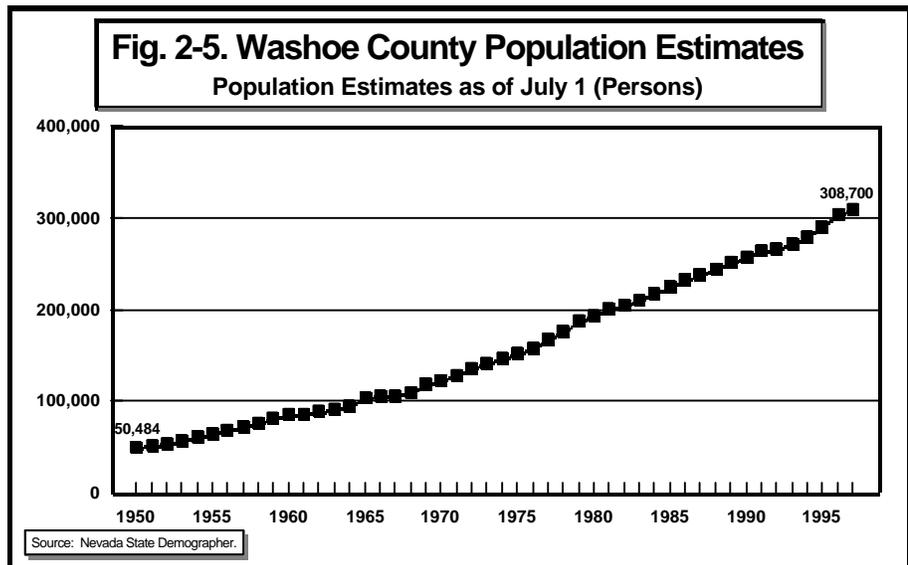


and gaming win growth that has characterized this market throughout the 1990's. The mega-resort casino complex, with employment requirements for each new facility frequently exceeding 5,000-6,000 workers (the Bellagio, which opened in late 1998, employs over 9,000 workers), has produced significant impacts on population growth, the expansion of support service businesses, infrastructure requirements, and water demands. Furthermore, new resort complexes opening in this gaming market through 1999 and into 2000 will extend these growth trends into the next century.



Mining. While gaming and tourism have had significant impacts on growth in Clark and Washoe counties, mining has had major influences on many of the rural counties' population and employment growth, demographic trends, and economic development. Since 1989, gold mining in Nevada has made a major contribution to a number of rural counties' economic growth, most especially Elko, Eureka, Humboldt, Lander, Nye, and Pershing counties.

More recently, however, this industry has come under growing economic stress. Beginning in late 1997 and extending into 1999, due primarily to European monetary reform (the creation of the European Monetary Union, or EMU) and Asian economic and financial problems, gold prices realized by Nevada mines have slipped dramatically. The average price of gold fell from \$387.87 per (troy) ounce in 1996 to \$331.29 per ounce in 1997, and by mid-1998 the price received by Nevada's mining interests was well below \$300 per ounce. By late 1998, gold's price had rebounded somewhat to "around" \$300 an ounce. Some of this price decline has, for the time



being, been mitigated through the mining industry’s use of “forward” contracts wherein the mining companies have locked in to committed prices for future gold sales.

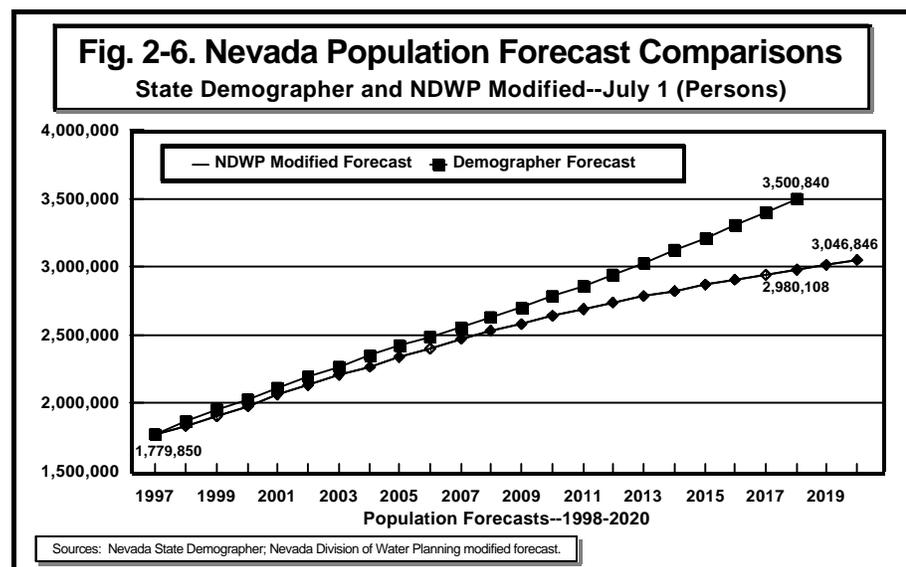
Over the plan’s forecast period, international economic and financial conditions are expected to continue to affect the nature and structure of mining operations in Nevada, and, in the process, the demographic and economic growth prospects of the rural, mining-dependent Nevada counties. Long-term conditions within the mining industry are expected to stabilize gold’s price at approximately \$280–\$350 per ounce, which has become incorporated into the levels of forecast production for the industry and particularly the amount of economically recoverable reserves.

Nevada Population Analysis and Forecasts

Two separate population forecasts are presented in the water plan. Every year the Nevada State Demographer estimates the current population and, following this, produces a twenty-year population forecast for all counties and the total state. All state agencies are required by the Governor’s Executive Order to utilize the population forecasts of the State Demographer in their budgeting and planning activities. Per agreement with the state’s population contracting agency, the Nevada Department of Taxation, the NDWP has developed an alternate set of county and state population forecasts based on inputs received from the individual counties, inputs from the Nevada Department of Employment, Training and Rehabilitation (DETR), and from the NDWP’s own best estimates.

Overall, the NDWP’s statewide population forecast predicts a more moderate population growth than that of the State Demographer. The reason for this is that Nevada’s total population is largely influenced by the trends in Clark County’s population, which in 1997 accounted for nearly 67 percent of the state’s resident population. Based on infrastructure requirements and current resource limitations, local planners in Clark County expect slower growth over the plan’s forecast horizon than does the Nevada State Demographer. The water plan incorporates both sets of population forecasts, as shown in Table 2–2.

Nevada Population Forecast Comparisons, to present an anticipated “range of expected growth.” However, only the NDWP’s forecasts are incorporated into the water plan’s future water withdrawal projections. The complete set of population forecasts and related graphical analysis for each county is presented in Appendix 2 of the Appendices. This



appendix also contains the comparative analysis of the two sets of forecasts for all individual counties.

The Nevada State Demographer has forecast a population for Nevada for the year 2018 of 3,500,840 persons, primarily based on the continued virtual exponential growth in Clark County. This forecast represents an overall increase in statewide population of 1,720,990 persons between 1997 and 2018, a near doubling of Nevada’s population over the next 20 years. The State Demographer’s forecast scenario results in an average annual rate of growth of statewide population of 3.3 percent per year for the overall forecast period of 1998 to 2018, with a sub-period average annual rate of growth of 3.6 percent between 1998 and 2008 slowing to 2.9 percent between 2008 and 2018. The State Demographer’s forecasted population for 2018 is approximately 15 percent higher than that of the NDWP.

**Table 2–2. Nevada Population Forecast Comparisons
Nevada State Demographer and Nevada Division of Water Planning (NDWP)**

Nevada Forecasts by Source	2000	2005	2010	2015	2018	2020
State Demographer						
Resident Population (persons)	2,034,020	2,421,020	2,783,700	3,313,260	3,500,840	n.a.
Nevada Division of Water Planning						
Resident Population (persons)	1,986,257	2,341,374	2,640,306	2,868,979	2,980,108	3,046,846
Difference (persons)	47,763	79,646	143,394	343,281	520,732	–
Percent Difference	2.4%	3.3%	5.2%	10.7%	14.9%	–

Note: The population forecasts of the State Demographer currently extend only through the year 2018. The difference amount represents the difference between the forecasts of the State Demographer and NDWP. NDWP population forecasts for Clark and Washoe counties are based on population forecast inputs from those counties.

Source Data: Nevada State Demographer; Nevada Division of Water Planning (NDWP).

The NDWP forecast scenario, based primarily on slower population growth in Clark County, assumes a more modest 2.5 percent overall annual rate of population growth for Nevada between the years 1998 and 2018, with sub-period average annual rates of 3.2 percent per year for 1998 to 2008 falling to an average annual rate of growth of 1.6 percent for the years 2008 through 2018.

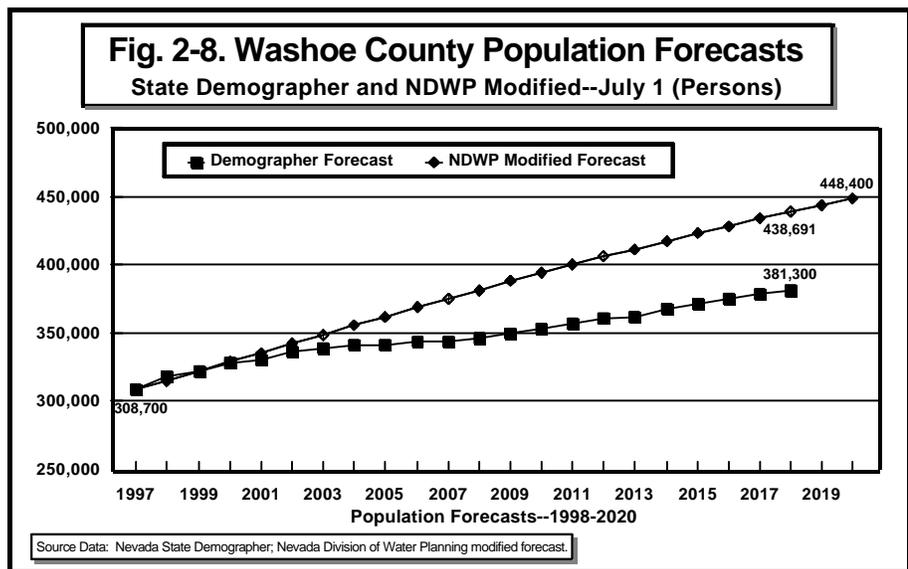
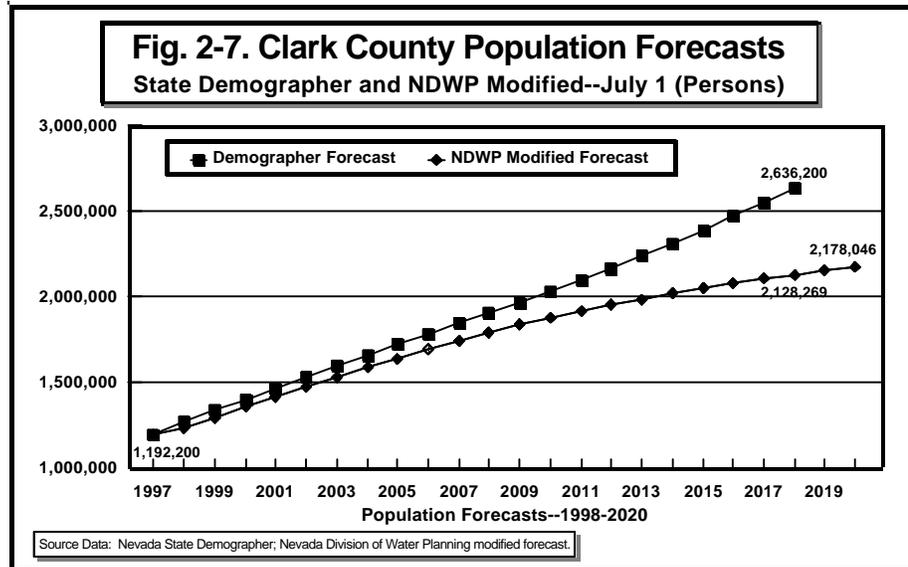
Based on the “range” of population forecasts developed independently by the State Demographer and the NDWP, Nevada is projected to grow at a rate of between 2.5–3.3 percent per year through 2018. Growth rates are expected to average between 3.2–3.6 percent per year between 1998 and 2008 and then moderate to between 1.6–2.9 percent per year between 2008 and 2018. This overall rate of

growth represents an increase in Nevada's total population of between 1,200,258 persons (NDWP) and 1,720,990 persons (State Demographer) between 1997 and 2018, resulting in a total forecasted population range of 2,980,108–3,500,840 persons by July 1, 2018. In the near term, the increase in the state's population will continue

to be fueled in large part by strong growth in the Las Vegas economy, particularly from its casino gaming and tourism industry. The gaming sector, at least for the next several years, will continue to see new major resort-casino construction, continuing to make southern Nevada the premier destination resort location in the world.

By contrast, the Washoe County and Carson City areas, and in fact much of northern Nevada, are beginning to see slower growth due to more intense competition in the gaming and tourism industry. Based on the growth in legalized gaming in other jurisdictions, and particularly the rise of Indian gambling on reservation lands, especially in California and the Pacific Northwest, it is reasonable to expect a continued slowdown in the growth of gaming and tourism throughout Nevada from approximately the year 2005 onward. The November 1998 passage of "Proposition 5", which legalized slot devices in Indian reservation casinos in California, is destined to have profound impacts on gaming in that state.

While at least two constitutional challenges to Proposition 5 have been filed, California voters appear to have changed their attitude towards legalized casino gaming within their state and further moves in this direction may be reasonably expected. Also, in early January 1999, California's Governor and Attorney General withdrew their support for any



challenge to Proposition 5.

While many of Nevada’s tourism and gaming attractions, both man-made and natural, continue to be unrivaled with respect to featured offerings in competitive markets, studies have shown that proximity has an important influence over player patronage. As a result, Nevada’s casino gaming industry will have to work hard to compete with developing gaming markets located closer to population centers throughout the U.S. The anticipated slowing in the growth in Nevada’s gaming industry, however, is not expected to be uniform and will be stronger in those markets which do not offer features of a distinctive nature to lure consumers from more proximate gaming opportunities.

Table 2–3. Nevada Population Forecast Summary, 1995–2020, presents a summary of the population forecasts for those larger Nevada counties expected to equal or exceed a total resident population of 50,000 persons by the year 2020. Complete population forecasts and analysis for all Nevada’s counties may be found in Appendix 2 of the Appendices. These population forecasts and county shares of total state population are based on the modified forecasts made by the NDWP and specifically incorporate the population forecasts provided by the Clark County Department of Comprehensive Planning and the Washoe County Department of Community Development.

**Table 2–3. NDWP Nevada Population Forecast Summary
Population Forecasts and Shares for Larger Nevada Counties — 1997–2020
(For counties expected to exceed 50,000 persons by the year 2020)**

State/County	1997	2000	2005	2010	2015	2020
Nevada						
Resident Population (persons)	1,779,850	1,986,257	2,341,374	2,640,306	2,868,979	3,046,846
Carson City						
Resident Population (persons)	50,410	54,445	60,703	66,041	70,099	72,587
Percent of Total State	2.83%	2.74%	2.59%	2.50%	2.44%	2.38%
Clark County (Las Vegas)						
Resident Population (persons)	1,192,200	1,355,368	1,640,444	1,874,431	2,046,229	2,178,046
Percent of Total State	66.98%	68.24%	70.06%	70.99%	71.32%	71.49%
Douglas County						
Resident Population (persons)	39,590	42,834	48,180	53,272	57,900	61,854
Percent of Total State	2.22%	2.16%	2.06%	2.02%	2.02%	2.03%
Elko County						
Resident Population (persons)	47,710	51,665	57,857	63,224	67,408	70,113
Percent of Total State	2.68%	2.60%	2.47%	2.39%	2.35%	2.30%
Lyon County						
Resident Population (persons)	30,370	33,721	39,377	44,878	49,914	54,170
Percent of Total State	1.71%	1.70%	1.68%	1.70%	1.74%	1.78%
Washoe County (Reno)						
Resident Population (persons)	308,700	329,021	362,260	393,884	422,917	448,400
Percent of Total State	17.34%	16.56%	15.47%	14.92%	14.74%	14.72%

Note: Counties included are only those that are forecast to equal or exceed a resident population of 50,000 persons by the end of

the forecast horizon (2020).

Source Data: Nevada State Demographer (1997 estimate); Nevada Division of Water Planning (2000–2020 forecasts).

Nevada’s Employment Composition and Industry Trends

Table 2–4. Nevada Covered Employment — 1980–1997, shows trends in Nevada’s total “covered employment” (a definition of employment which includes those employees covered under state and federal unemployment insurance programs) as well as trends in the shares of total employment by principal industry sector. Employment trends and industry composition are

important considerations in forecasting commercial and industrial water withdrawals as each industry sector tends to use water at different rates in terms of gallons per employee per day. To forecast commercial and industrial water withdrawals for the water plan, an average commercial and industrial “water use coefficient” for all industry sectors is used in conjunction with forecasted total employment. It is therefore important to assess anticipated changes in future employment composition by specific industry sectors to insure that no dramatic changes are expected which might significantly alter the average usage factor and thereby jeopardize the reasonableness and usefulness of this forecast methodology.

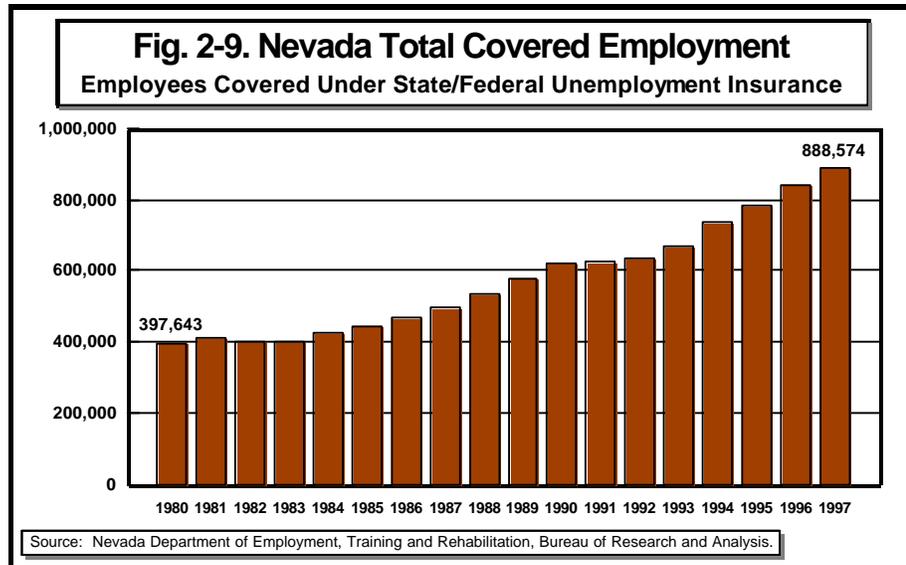
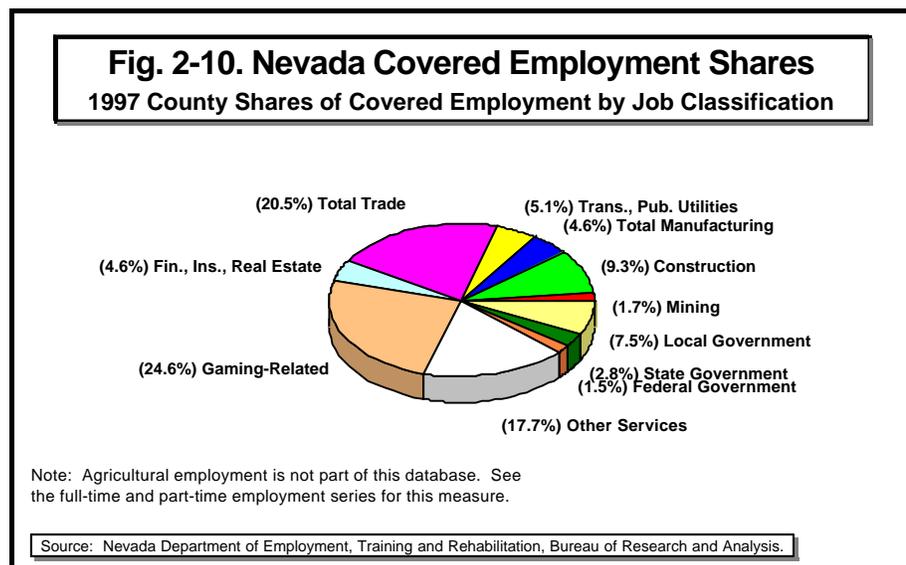


Fig. 2–9. Nevada Total Covered Employment shows the trend in statewide total employment from 1980 to 1997. This graph shows the slowdown in employment growth in Nevada during the national recessionary periods of 1980-82 and 1990-91, clearly indicating Nevada’s linkages to national business cycles. The state’s covered employment data,



compiled by the Nevada Department of Employment, Training and Rehabilitation (DETR), represents the most accurate and detailed measure of commercial and industrial employment in the State of Nevada.

Table 2–4. Nevada Covered Employment Trends — 1980–1997
Trends in Covered Employment and Shares by Principal Industry Sector (Workers)

Industry Category	1980	1985	1990	1997	1980-97 Change in Workers	1980-97 Percent Change
Total State	397,643	443,527	619,638	888,574	490,931	123.5%
Mining Percent of Total	6,219 1.56%	6,081 1.37%	14,321 2.31%	14,663 1.65%	8,444	135.8%
Construction Percent of Total	26,434 6.65%	24,121 5.44%	46,903 7.57%	81,953 9.22%	55,519	210.0%
Total Manufacturing Percent of Total	19,200 4.83%	21,958 4.95%	26,245 4.24%	40,604 4.57%	21,404	111.5%
Trans., Public Utilities Percent of Total	22,403 5.63%	23,908 5.39%	31,445 5.07%	44,877 5.05%	22,474	100.3%
Total Trade Percent of Total	80,330 20.20%	90,874 20.49%	124,260 20.05%	180,425 20.31%	100,095	124.6%
Fin., Ins., Real Estate Percent of Total	17,777 4.47%	21,287 4.80%	28,245 4.56%	40,338 4.54%	22,561	126.9%
Service Industries Percent of Total	165,516 41.62%	192,289 43.35%	267,067 43.10%	371,753 41.84%	206,237	124.6%
Gaming-Related Percent of Total	114,950 28.91%	125,483 28.29%	165,384 26.69%	216,491 24.36%	101,541	88.3%
Total Government Percent of Total	56,830 14.29%	59,788 13.48%	75,962 12.26%	104,254 11.73%	47,424	83.4%
Federal Government Percent of Total	10,369 2.61%	10,462 2.36%	12,341 1.99%	13,519 1.52%	3,150	30.4%
State & Local Gov't Percent of Total	46,462 11.68%	49,325 11.12%	63,621 10.27%	90,736 10.21%	44,274	95.3%
State Government Percent of Total †	15,300 32.93%	15,621 31.67%	19,354 30.42%	24,974 27.52%	9,674	63.2%
Local Government Percent of Total †	31,162 67.07%	33,704 68.33%	44,267 69.58%	65,762 72.48%	34,600	111.0%

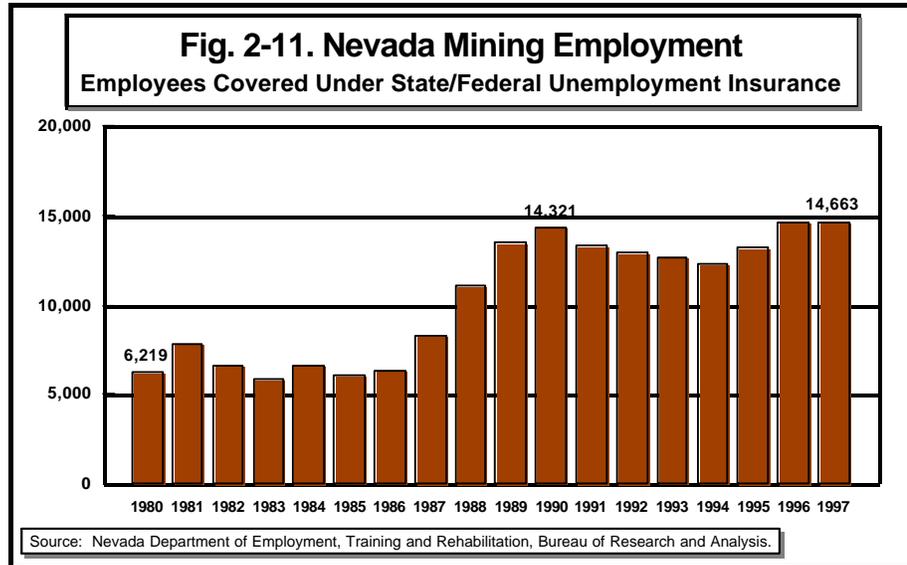
Notes: Includes employment covered under state and federal unemployment insurance programs. State and local government employment shares for the years 1980, 1985, and 1990 are estimated based on trends of 1993 through 1997. Agriculture and related employment categories (i.e., agricultural services, forestry and fisheries) are not part of this database.

† Percent of total for state government and local government are based on a percent of total state and local government only.

Source Data: Nevada Department of Employment, Training and Rehabilitation (DETR), Research and Analysis Bureau.

Fig. 2–10. Nevada Covered Employment Shares, shows the distribution of total covered employment across Nevada’s principal industry sectors for 1997. However, this database does not include workers in the sectors of farming, agricultural services, forestry or fisheries. Therefore, employment

in these sectors was analyzed using another employment measure, termed “full and part-time employment,” which is compiled by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). Fig. 2–15. Nevada Full/Part-Time Employment Shares, presents this alternative employment measure and, while not as recent as the covered



employment data, it does incorporate agricultural and related employment for the State of Nevada. Fig 2–15 shows a wide range in employment shares for 1996 in various sectors from a high of 42.7 percent in total services to 1.5 percent in farming and related agricultural service industry jobs.

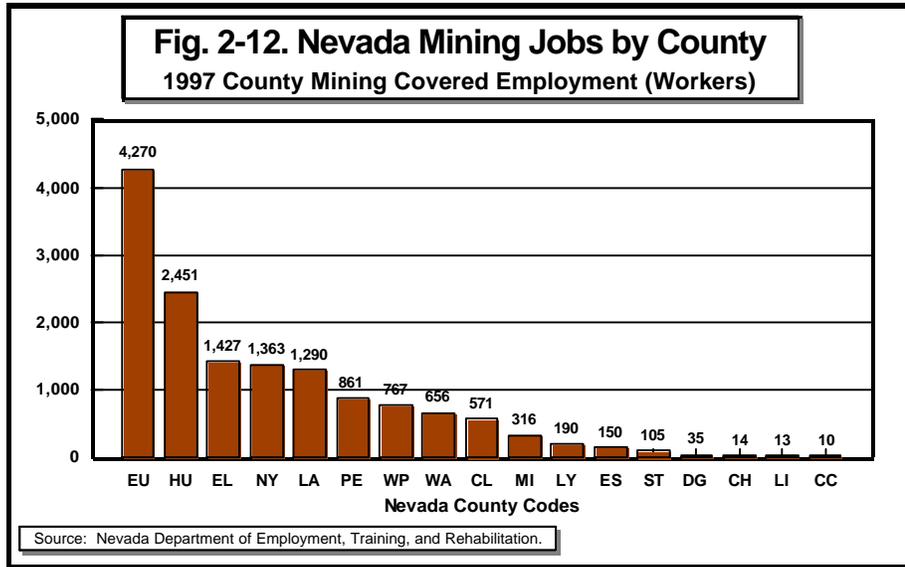
Table 2–4 shows that since 1980, covered employment in Nevada’s construction industry has shown the most rapid growth, which is not surprising in a rapidly growing state like Nevada. This construction industry growth has been driven by construction needed for commercial development (primarily major casino complexes in the Las Vegas economy) as well as growth in associated retail trade businesses, residential housing units and various infrastructure requirements such as airport facilities, roads and highways, public utilities, schools, etc. Since 1989, statewide construction jobs in support of Nevada’s mining industry also contributed to these totals. In the following section each principal industry sector is analyzed in terms of its historical trends and future prospects for growth.

Employment Analysis by Industry Sector

Construction. In addition to its rapid growth, construction employment has proven to be the most volatile employment sector in the state. Nevada’s construction employment declined by 25.0 percent, or 6,594 workers from 1980 to 1983, reflecting the 1980-82 national recessionary period. Then, reflecting the 1990-91 national recession, Nevada’s construction employment declined again by 16.4 percent or 7,690 workers between 1990 and 1993. The construction industry increased its share of statewide total covered employment from 6.6 percent in 1980 to 9.2 percent by 1997. Continued strong, albeit more moderate, growth trends in this sector are expected into the next century, with some slowdown occurring in the later part of the plan’s forecasting horizon (1998-2020).

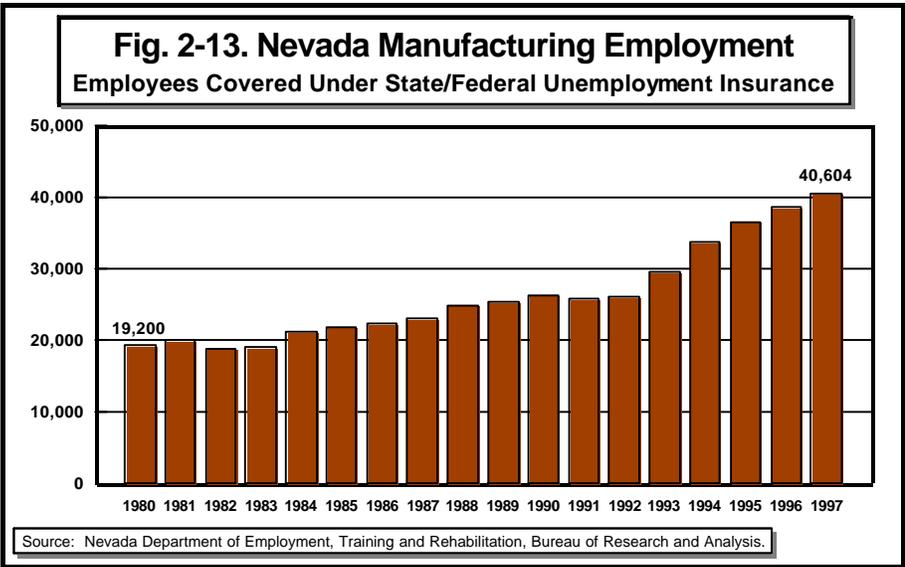
Mining. Mining jobs in Nevada rose by 8,444 workers, an increase of nearly 136 percent between 1980 and 1997 (see Fig. 2–11). More recent trends have indicated a marked slowdown in this industry sector due to price pressures on Nevada’s primary mineral, gold, and resultant cost restraints on mining operators. Due to the take-off of Nevada’s gold mining industry in the late 1980’s, this

industry’s share of statewide total covered employment rose from 1.6 percent in 1980 to 2.3 percent by 1990. By 1997, due to significant declines in the price of gold, Nevada’s mining industry’s share of total covered employment slipped back to 1.6 percent, the same share of statewide total employment it held in 1980. Over the near term, mining employment



in Nevada is expected to decline, eventually falling and then remaining at about 12,000-13,000 workers over most of the water plan’s forecast period. Impacts on the mining industry due to price swings and continued uncertainty in world gold markets will affect both employment and population growth in Nevada’s rural and mining-dependent counties. Fig. 2–12 shows the number of 1997 mining jobs ranked by county.

Manufacturing. Manufacturing has shown relatively good growth in terms of employment. Between 1980 and 1997, employment in this industry sector has risen by 21,404 workers, or 111.5 percent (see Fig. 2–13). As a primary industry targeted for the state’s economic diversification efforts, continued growth in the state’s manufacturing sector is expected. Although manufacturing’s share of statewide total covered employment has actually declined slightly from 1980 (4.8 percent to 4.6 percent), its relative stability in terms of employment share is counter to national trends in which manufacturing employment slid significantly from over 20 percent of total employment in the early 1960’s to only 14 percent in the 1990’s.



Transportation and Public Utilities.

Nevada’s transportation and public utility jobs, as well as jobs in finance, insurance and real estate, represent two industry sectors in which only modest

gains to employment are anticipated over the forecast horizon. These industries are being particularly impacted by mergers (finance and especially banking) and deregulation (public utilities, particularly electrical power, gas and water), with the net effect of only modest increases expected to employment over the forecast horizon. Since 1980, transportation and public utility jobs have grown by 100.3 percent, or 22,474 workers. This industry's share of statewide total covered employment has fallen, however, from 5.6 percent in 1980 to 5.0 percent by 1997.

Recent trends in the mandated deregulation of the electrical power industry are destined to result in mergers and, initially, reduced levels of employment. However, there also has been a tendency for these newly deregulated businesses to expand into new businesses more or less related to their primary business of power generation or distribution. Consequently, later in the forecast horizon, more rapid employment growth in the public utility sector may be expected.

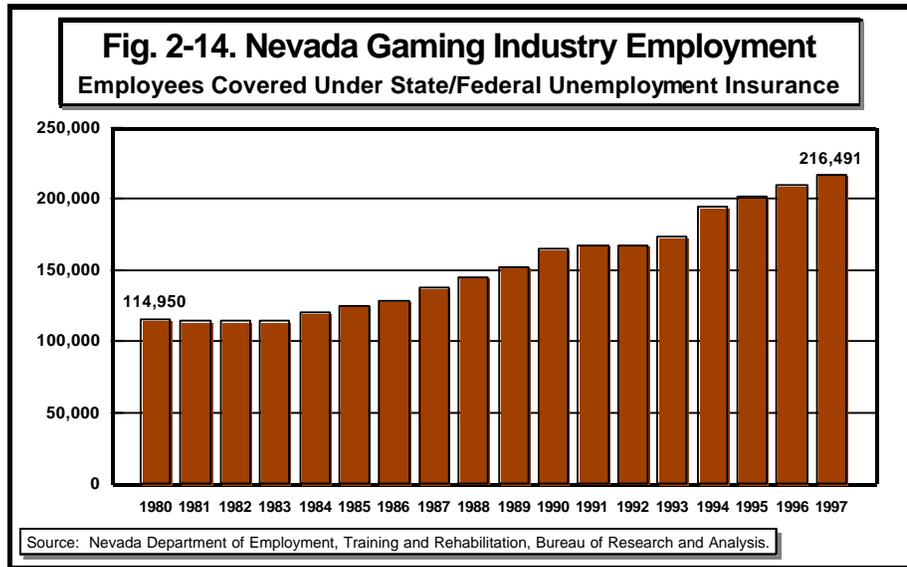
Finance, Insurance and Real Estate (F.I.R.E.). Finance-related jobs in Nevada have shown an increase of 126.9 percent since 1980, representing an addition of 22,561 workers to total state employment. Much of this increased employment has come in the real estate area, whereas employment trends in the state's financial institutions, and banking in particular, have been and will continue to be adversely impacted by out-of-state ownership and continued mergers and acquisitions. Financial-related employment in the state showed virtually the same share of total jobs in 1997 as it did in 1980, 4.5 percent.

Wholesale and Retail Trade. Total wholesale and retail trade employment growth from 1980 to 1997 has shown gains slightly above those of the state average (124.6 percent versus 133.5 percent). From 1980 to 1997, employment in this industry sector has grown by 124.6 percent, representing an addition of 100,095 workers since 1980. The majority of this growth has occurred in the state's retail trade businesses and has been closely linked to growth in Nevada's tourism and gaming industries, as well as the rapid growth in resident population. This industry's share of statewide total employment has changed only slightly since 1980, rising from 20.2 percent to 20.3 percent of statewide employment by 1997. More modest increases in the state's gaming and tourism industry sectors are destined to also moderate future growth rates in total trade employment.

Total Services. Employment in all of Nevada's service industries (i.e., gaming-related, medical and health care services, personal services, business services, etc.), which represents the dominant industry sector in the state, has advanced by 124.6 percent since 1980, resulting in an addition of 206,237 new workers. Particularly strong employment growth has been shown in business services and medical and health care services industry sectors. Due primarily to more modest gains in gaming-related employment, which accounted for over 58 percent of total service industry employment in 1997, jobs in total services have only increased slightly since 1980, rising from a 41.6 percent share of statewide total employment to 41.8 percent by 1997.

Services – Gaming and Tourism. Relative to other principal industry sectors, gaming-related

employment in Nevada has shown more modest employment growth since 1980 (see Fig. 2-14). This trend primarily reflects the effects of a more competitive gaming industry, both interstate and intra-state, and a maturing Nevada economy in which gaming continues to represent the dominant basic industry, but one of diminishing importance as support industries expand



their employment levels. Gaming’s share of statewide total employment has fallen from 28.9 percent in 1980 to 24.4 percent by 1997 as Nevada’s support industries have, in effect, played “catch-up” to the lead that the gaming and tourism industry showed beginning in the early 1980’s. Gaming, however, will continue as the primary industry sector, although its dominance is destined to slowly decline as the market for tourists becomes increasingly saturated and Nevada finds itself competing with the growing number of legalized gaming locations throughout the U.S. and the world.

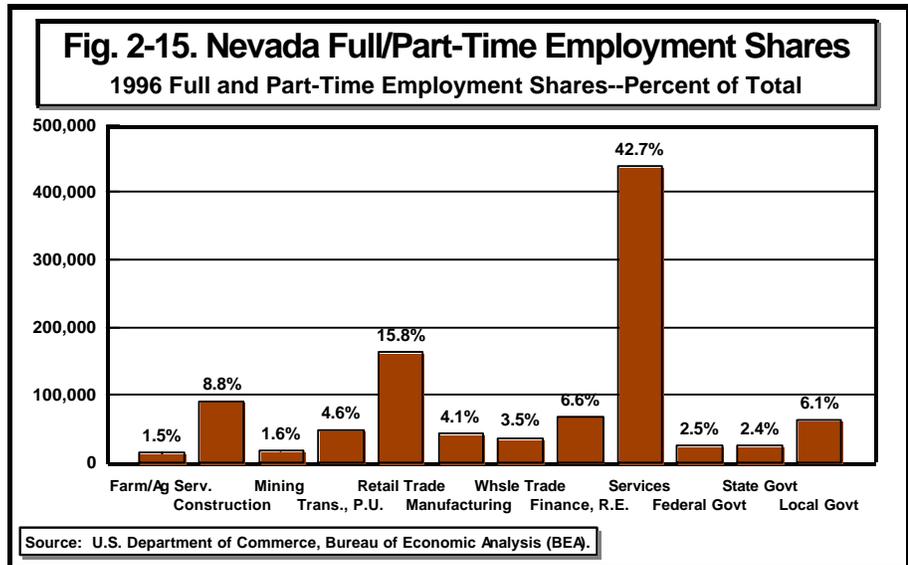
Government. Statewide total government employment (federal, state, and local governments) has reflected the effects of rapid population growth and the need to provide public services by local (county and city) governments. As a result, the greatest growth in the overall government sector has occurred at the local government level, where employment has risen 111.0 percent since 1980, reflecting a statewide increase of 34,600 jobs. Local government’s share of total government employment has risen from approximately 67 percent in 1980 to over 72 percent by 1997. State government has also been influenced by population demands, but not to the extent shown by Nevada’s local governmental entities. Total state government employment rose from 15,300 workers in 1980 to nearly 25,000 workers by 1997, an increase of 63.2 percent or 9,674 workers. By comparison, total employment in Nevada has risen by nearly twice this amount, or nearly 124 percent since 1980.

Characteristically, federal government employment has risen more in response to program requirements and federal budgetary restrictions than local population effects. On this basis, Nevada’s federal government employment rose by only 30.4 percent since 1980, representing an increase of 3,150 workers over 17 years. Over the planning horizon covered by the State Water Plan, federal government employment growth is expected to remain relatively stable and state government employment to slow from prior periods. Local government employment will also moderate somewhat as statewide overall economic activity begins to slow and state and local government budgets become more strained.

Agriculture and Related Industries. Using BEA’s full time and part-time employment data,

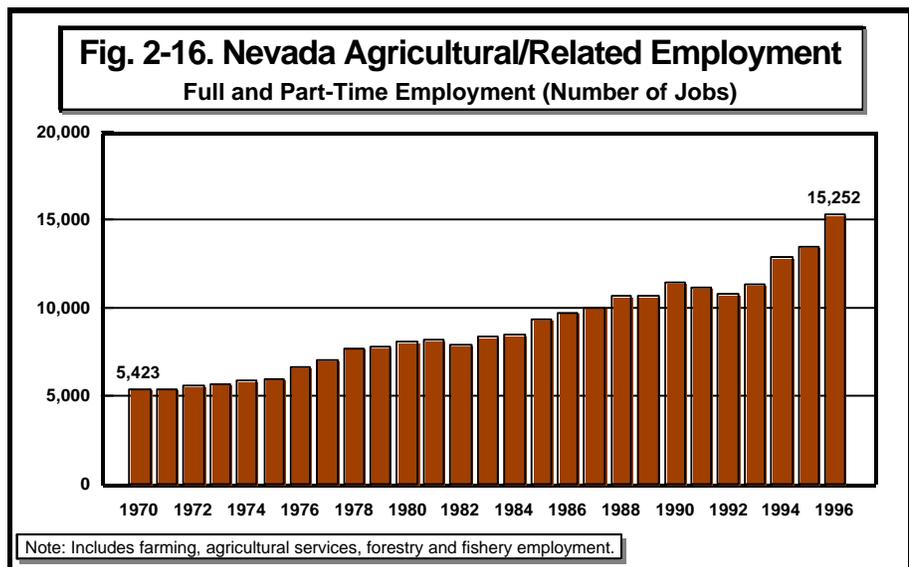
Nevada’s agriculture (farming) industry accounted for only 1.5 percent of Nevada’s total employment in 1996 and has shown virtually no growth since 1970. On the other hand, employment in agricultural services, forestry and fisheries has expanded more dramatically. While it appears that total agricultural-related

employment has increased since 1970 (see Fig. 2-16. Nevada Agricultural/Related Employment), on-farm jobs have actually declined slightly from 1970 to 1996. Fig. 2-17. Nevada Agricultural Employment Composition shows that agricultural service and related jobs have grown from 820 workers in 1970 to 10,963 workers in 1996. The majority of

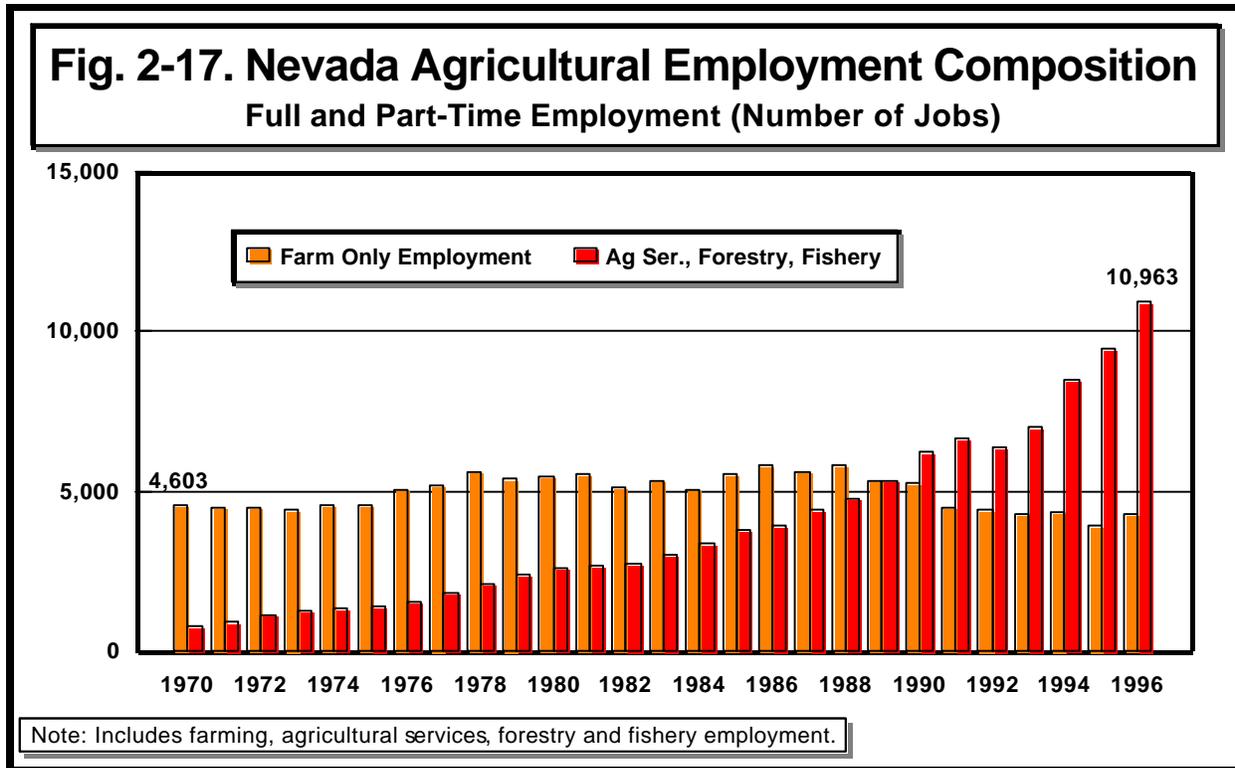


these jobs are in lawn services and landscaping and are primarily located in the more urban areas of the state. For example, of this total amount, 9,432 agricultural and related service jobs, or 86.0 percent, were located in either Carson City, Clark or Washoe counties. Employment growth in the farm sector is expected to continue to decline moderately while the agricultural and related employment sectors are expected to continue to show strong growth along with population and commercial and industrial expansion.

While some changes are expected in the overall composition and share of industry sectors within individual counties and for the total state, it is not expected that these changes in job mix will be significant enough to preclude the use of an average commercial and industry water use factor (i.e., gallons per worker per day) to estimate future commercial and industrial water use patterns based on total employment trends. Both state and county economic and employment data sets and the related water use coefficients will be updated as new



information becomes available.



Nevada’s Casino Gaming Industry

Casino gaming represents Nevada’s primary industry sector in terms of persons employed, payrolls, “exports” (of gaming-related products and services) and impacts on other industry sectors both in terms of employment and productive output. Table 2–5. Nevada Casino Gaming Win — 1970–1997 presents basic revenue trends in Nevada’s gaming industry for its principal gaming markets (Clark, Washoe and Elko counties, South Lake Tahoe, and Carson Valley in Table 2–5) and the various gaming sub-markets within these principal gaming markets. The gaming win measures the dollar volume of casino patrons’ wagered amounts that are retained by the casino after all payouts as winnings. This amount is also referred to as the “house hold”. As a primary revenue source, the gaming win represents the most fundamental measure of the economic and financial health of this industry and the effects of tourists’ patronage of Nevada casinos.

Table 2–5 shows the effects that increasing intra-state competition has had on Nevada’s various casino gaming markets. Rapid casino expansion, primarily in the Las Vegas (Clark County) gaming sub-markets of the Las Vegas Strip and the Boulder Strip, has adversely affected gaming revenue trends of other sub-markets within Clark County, i.e., the Las Vegas Downtown and Laughlin casinos. Laughlin’s revenue growth has also been adversely affected by Indian casinos around Phoenix, Arizona, a principal “feeder” market for this gaming location. Even so, the Clark County

gaming market has shown impressive gaming win growth and now accounts for nearly 80 percent of the state’s total gaming win (see Fig. 2–18).

Table 2–5. Nevada Casino Gaming Win — 1970–1997
Total Casino Gaming Win† by Principal Gaming Market (Millions of Dollars)

Principal Gaming Market or Sub-Market	1970	1980	1990	1997	1990-97 Change in Gaming Win and Share	1990-97 Percent Change in Gaming Win
TOTAL STATE	\$604.35	\$2,478.45	\$5,480.25	\$7,802.70	\$2,322.45	42.38%
Clark County[1]	\$394.24	\$1,697.41	\$4,103.39	\$6,152.42	\$2,049.03	49.94%
Percent of Total	65.23%	68.49%	74.88%	78.85%	3.97%	
Las Vegas Strip	\$290.90	\$1,231.98	\$2,604.98	\$3,809.40	\$1,204.41	46.23%
Percent of Total	48.13%	49.71%	47.53%	48.82%	1.29%	
Las Vegas Downtown	\$91.50	\$348.63	\$676.91	\$679.05	\$2.15	0.32%
Percent of Total	15.14%	14.07%	12.35%	8.70%	-3.65%	
Laughlin	n.a.	n.a.	\$398.64	\$482.26	\$83.62	20.98%
Percent of Total			7.27%	6.18%	-1.09%	
Boulder Strip	n.a.	n.a.	\$142.14	\$411.79	\$269.64	189.70%
Percent of Total			2.59%	5.28%	2.68%	
Rest of Clark County[2]	\$11.84	\$116.80	\$280.72	\$769.93	\$489.21	174.27%
Percent of Total	1.96%	4.71%	5.12%	9.87%	4.75%	
Washoe County[3]	\$119.52	\$462.28	\$814.14	\$995.23	\$181.09	22.24%
Percent of Total	19.78%	18.65%	14.86%	12.75%	-2.10%	
City of Reno	\$91.72	\$362.12	\$628.02	\$751.21	\$123.19	19.62%
Percent of Total	15.18%	14.61%	11.46%	9.63%	-1.83%	
City of Sparks	n.a.	n.a.	\$104.04	\$150.64	\$46.61	44.80%
Percent of Total			1.90%	1.93%	0.03%	
South Lake Tahoe[4]	\$72.21	\$221.09	\$339.16	\$294.97	(\$44.19)	-13.03%
Percent of Total	11.95%	8.92%	6.19%	3.78%	-2.41%	
Carson Valley[5]	\$3.88	\$34.63	\$57.26	\$73.75	\$16.49	28.80%
Percent of Total	0.64%	1.40%	1.04%	0.95%	-0.10%	
Elko County	\$7.48	\$37.87	\$111.67	\$198.31	\$86.64	77.58%
Percent of Total	1.24%	1.53%	2.04%	2.54%	0.50%	
City of Wendover	n.a.	n.a.	\$53.39	\$99.83	\$46.44	86.99%
Percent of Total			0.97%	1.28%	0.31%	

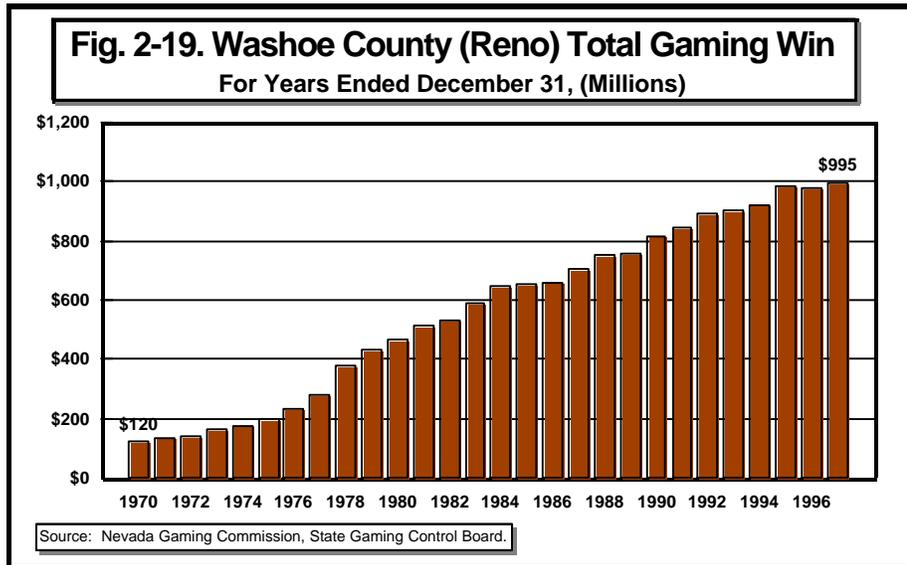
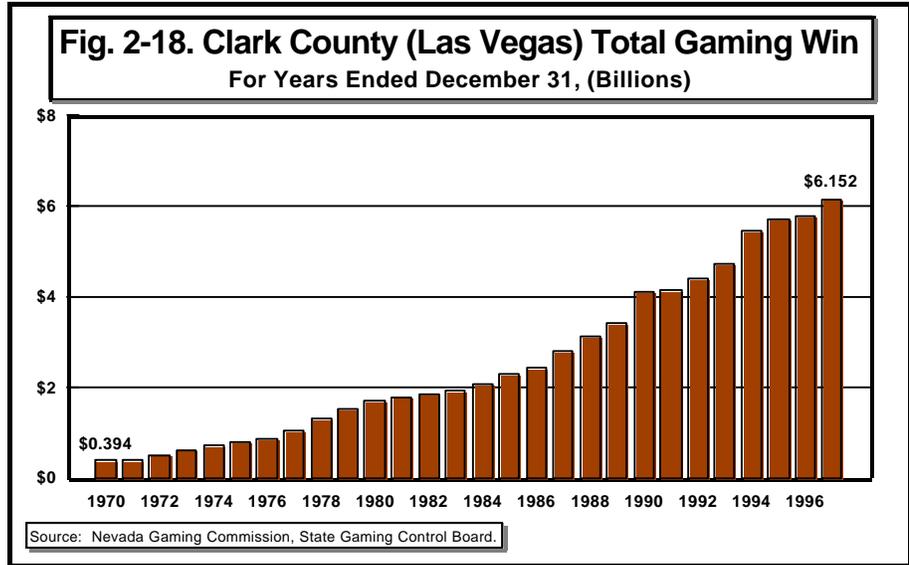
Notes: “Percent of Total” measures each gaming market’s share of Nevada’s total gaming win. Average annual growth rates (Ave. Ann.) are the average annual rate of growth between 1990 and 1997. Principal gaming markets are presented in bold face type; gaming “sub-markets” appear in regular type. Carson Valley casinos include those in Carson City and Douglas County, excluding the South Lake Tahoe properties.

† Casino gaming win is equal to the “house hold,” or the amount retained by the casino after all payouts as winnings to customers.
n.a. = Gaming win data not available for these time periods.

Source Data: Nevada Gaming Commission, State Gaming Control Board.

The expansion of mega-resort casino complexes along and just off the Las Vegas Strip has also had

an adverse impact on the northern Nevada gaming markets of Washoe County (Reno-Sparks) and South Lake Tahoe (Douglas County) as can be seen by a marked slowing of growth in these markets in the 1990's (see Fig. 2-19). These trends, combined with near-term openings of major casino resort complexes along the Las Vegas Strip (Bellagio, Mandalay Bay, Venetian, Paris, etc.) in late 1998 and into 1999 portend a continuation of intensifying competition for a limited supply of tourists and casino patrons. Consequently, based on both interstate and intra-state competition, the forecast for this industry is for more modest overall growth over the entire forecast horizon and even slower growth in those gaming markets which do not make sufficient investments to maintain a competitive advantage in this industry. Due to the relatively greater importance of gaming to the Las Vegas economy, this assessment constitutes the primary reason for lower rates of growth in forecasts for both employment and population in southern Nevada.



Nevada's Mining Industry

Table 2-6. Nevada Mineral, Petroleum, Geothermal Production, shows the relative concentration of Nevada's mineral industry in gold and silver production, especially gold. This is particularly true with respect to mining's effects on employment in a number of rural counties. Also shown in this table are the relatively wide price fluctuations which have typified the market behavior of these precious metals. In 1997, gold prices had averaged \$331 for Nevada's mining operations and by early 1998

they had moved below \$300 per ounce, creating severe pressures on the state’s gold producers. Based on both economic fundamentals and financial market conditions, it is expected that some recovery to the price of gold will be experienced over the forecast horizon, but it is doubtful that prices will recover to levels shown in the early 1990’s. Consequently, mining employment in Nevada is expected to decline slightly over the next 20 years as producers attempt to cut costs, especially salaries, and improve operating efficiencies. (See Fig. 2–20 for trends in the gross proceeds of Nevada’s mines from 1977 through 1997, and Fig. 2–21 for county shares of 1997’s gross proceeds of mines.)

Table 2–6. Nevada Mineral, Petroleum, Geothermal Production
Statewide Production of Principal Minerals for Years 1978–1997 (Units of Production)

Mineral	1978	1980	1985	1990	1995	1997
Barite (thousands of short tons)	1,788	2,268	590	405	514	586
Copper (thousand lbs)	20,543	—	—	11,067	13,000	148,600
Geothermal Power (thousands of mega-water hours)	—	—	—	884	1,360	1,348
Gold (troy ounces)	260,895	250,618	1,276,114	5,813,000	6,764,000	7,828,000
Mercury (76-pound flasks)	24,163	3,300	16,530	—	—	—
Petroleum (thousands of 42-gallon barrels)	1,269	893	3,060	4,012	1,342	1,000
Sand and Gravel (thousands of short tons)	10,040	7,000	9,979	26,000	28,000	28,000
Silver (troy ounces)	804,000	167,000	4,947,000	21,529,000	24,602,000	24,645,000
Gold–Average Price per Ounce (dollars)	\$193.55	\$613.28	\$317.66	\$380.02	\$384.09	\$324.99
Silver–Average Price per Ounce (dollars)	\$5.40	\$21.54	\$6.14	\$5.00	\$5.19	\$4.62

Note: In 1997, gold and silver comprised nearly 86 percent of total mineral valuation in Nevada.
Source Data: Nevada Bureau of Mines and Geology, *The Nevada Mineral Industry*, various issues.

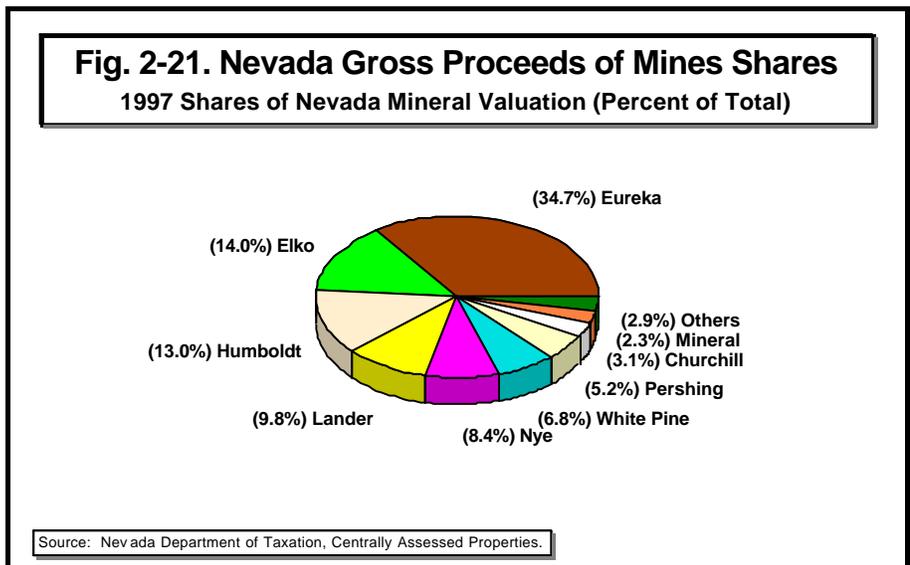
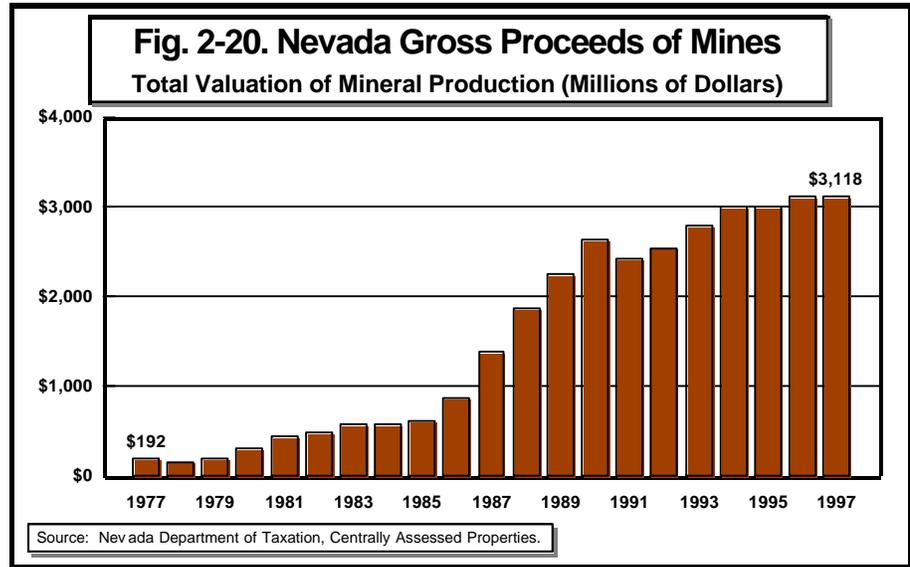
Table 2–6 shows the historical relative market prices received for Nevada’s precious metals. This information shows that market prices for both gold and silver have varied greatly over the entire period of presentation, and most especially during times of economic uncertainty and inflation, i.e., the 1980-82 recessionary period. This high price variability reflects the more historic use of these precious metals, and particularly gold, as a “store of value” and inflation hedge. From these trends, which show the price of gold varying from a low of \$194 per ounce in 1978 to a high of \$613 per ounce in 1980 (an inflationary and recessionary year), and the price of silver ranging between \$5.00 and \$21.54 per ounce, it becomes more obvious why Nevada’s production of these minerals has shown such extreme variation over recent years. In fact, gold production in Nevada has been

relatively stable during the more recent period of economic stability during the 1990's when gold's price has remained within a relatively narrow range well above \$300 per ounce.

The declining price of gold has resulted in significant declines in mining-dependent taxable sales (a major source of county tax

revenues) as mining companies have curtailed major investment projects and reduced local spending. To offset declining market prices and revenues, Nevada's gold mines have been able to reduce their weighted average cash production costs from an average of \$229 per ounce in 1996 to \$214 per ounce in 1997. Much of this cost constraint has come from the unique relationship between the market price of gold and production costs. As market prices decline, gold producers quickly switch to higher grade deposits (higher concentrations of gold per ton of earth removed), thereby automatically lowering production costs. More recently, mines have been able to effect this change very rapidly, thereby virtually "locking in" production costs to market prices.

Based on continuing international financial changes (European monetary reform and the backing levels in gold of the European Monetary Union) and economic turmoil (Asia), some further moderation to the price of gold is expected in 1998 and into 1999. Mining and construction-related employment have begun to reflect the impacts of these gold price declines and production cost restraints. Even though Nevada currently remains one of the most efficient (i.e., least-cost) gold producers in the world (e.g., in 1997 South Africa showed an average production cost of \$301 per ounce and Australia showed \$261 per ounce), the extent of the worldwide decline in the price of gold has nonetheless forced severe cost-cutting measures and altered the



Nevada gold industry's development and production efforts, shifting emphasis to higher grade ore bodies and more productive underground gold mining versus surface (open pit) mining. Uncertainty about the price of gold is destined to affect future employment and population growth in the rural Nevada counties

So long as gold has been priced at a "premium" based on its extensive use as an effective hedge against inflation and economic uncertainty, and not priced solely on its intrinsic (i.e., industrial or commercial usage) value, such price fluctuations will likely continue. More recent trends, however, show gold's diminished role as an inflation hedge as well as a less important role as a monetary reserve held by central banks in support of national currencies. In particular, the formation of the European Monetary Union, with its requirement for significantly lower holdings of gold reserves, has resulted in large bullion sales, consequently depressing gold prices below \$300 per ounce in early 1998. Once these transitory effects have settled down, however, some recovery to gold's longer-term price is expected, although it is uncertain as to the extent of that recovery. Forecasts for Nevada's mining industry will depend primarily on the market price of gold, as this price "drives" economically-recoverable reserves upon which industry production and exploration depend. Forecast assumptions incorporated into this plan for mineral production and mining water withdrawals are based on an industry-accepted long-term price of gold at \$280–\$350 per ounce.

The resurgence of copper mining in Nevada, principally in White Pine County, is also a recent trend as reflected in Table 2–6. As with precious metals, falling copper prices have affected this industry and it is not certain if recent cost-cutting efforts will insure the long-term survivability of copper mining in Nevada. The fluctuating world-wide prices of both industrial and precious minerals has characterized Nevada's mining industry since the late 1800's and makes forecasting this industry (e.g., production, employment, water withdrawals, etc.) especially difficult in the face of numerous economic, financial, political and environmental related influences and uncertainties.

Nevada's Agricultural Industry

Agriculture represents one of Nevada's oldest and most lasting economic activities. Since the first settlements were established in the 1850's, agriculture in Nevada has continued to survive and even prosper. Today, agriculture remains a fundamental socioeconomic underpinning for a number of rural Nevada counties and, no doubt, will remain an integral part of these counties' economies irrespective of current or future mining trends. While on the whole agriculture may appear to have relatively little impact on Nevada's overall economic trends, the importance of agriculture for a number of rural counties cannot be overstated. See Fig. 2–22 for trends in Nevada's total farm marketings since 1970 and Fig. 2–23 for 1996 shares of total farm marketings by county.

Table 2–7. Nevada Agricultural Statistics — 1974–1995, summarizes key agriculture statistics for Nevada in terms of irrigated acreage, total farm marketings (monies received from farm marketing sales), farm worker employment and employment in agricultural services, forestry and fisheries. From the information in this table, it appears that agriculture, in terms of total irrigated acreage, peaked in the state during the late 1970's or early 1980's. (Precise determination is difficult and some important agricultural data, for example irrigated acreage, is only obtained by the Census Bureau

every four or five years.) Based on rising agricultural prices, farm marketings, however, continued to increase through at least 1990 despite fewer acres being irrigated. Livestock and related sales constituted over 70 percent of total farm marketings from 1974 through at least 1987, falling to 60 percent by 1995.

Table 2–7. Nevada Agricultural Statistics — 1974–1995
Irrigated Acreage, Farm Marketings and Farm-Related Employment

NEVADA	1974	1978	1982	1987	1990	1995
Irrigated Acres	777,510	881,151	829,761	773,588	728,350	715,439
Farm Marketings (\$000s)	\$145,458	\$204,047	\$250,610	\$271,904	\$326,889	\$298,085
Livestock and Products	\$115,979	\$154,820	\$181,373	\$203,774	\$211,486	\$179,589
Percent of Marketings	79.7%	75.9%	72.4%	74.9%	64.7%	60.2%
Total Crops	\$29,479	\$49,227	\$69,237	\$68,130	\$115,403	\$118,496
Percent of Marketings	20.3%	24.1%	27.6%	25.1%	35.3%	39.8%
Total Agric. Employment	5,895	7,728	7,863	10,033	11,487	13,142
Farm Workers	4,570	5,639	5,140	5,628	5,260	3,962
Percent Total Employment	77.5%	73.0%	65.4%	56.1%	45.8%	30.2%
Agric. Services Workers	1,325	2,089	2,723	4,405	6,227	9,180
Percent Total Employment	22.5%	27.0%	34.6%	43.9%	54.2%	69.8%

Source Data: Irrigated acreage figures for 1974, 1978, 1982 and 1987 are from the U.S. Bureau of the Census, Agriculture Division; irrigated acreage figures for 1990 are estimates from the USGS data; irrigated acreage for 1995 are derived from estimates made by the NDWP. Farm marketings, number of farm and agricultural service workers are from U.S. Department of Commerce, Bureau of Economic Analysis (BEA). Agricultural Services Workers include workers in agricultural services, which is primarily landscaping and lawn care occupations, as well as jobs in the forestry and fisheries employment areas.

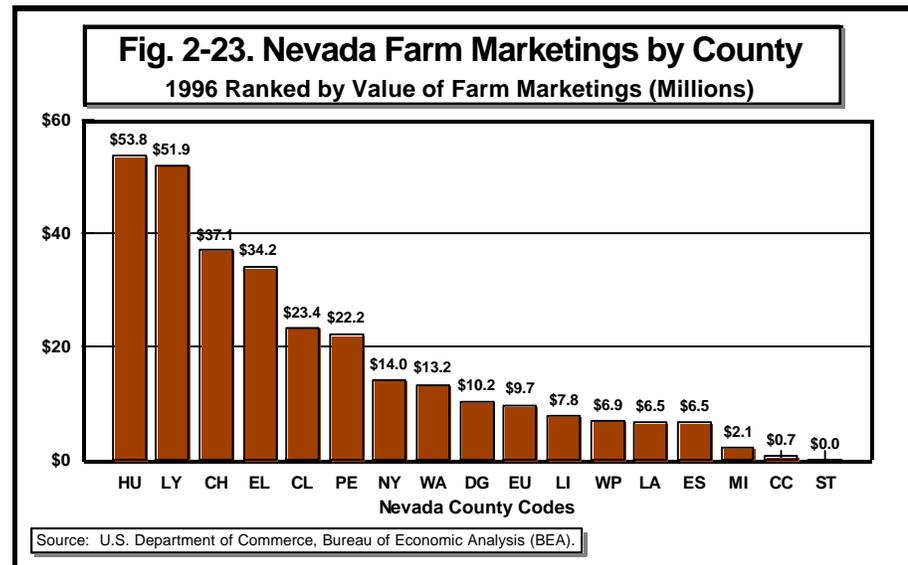
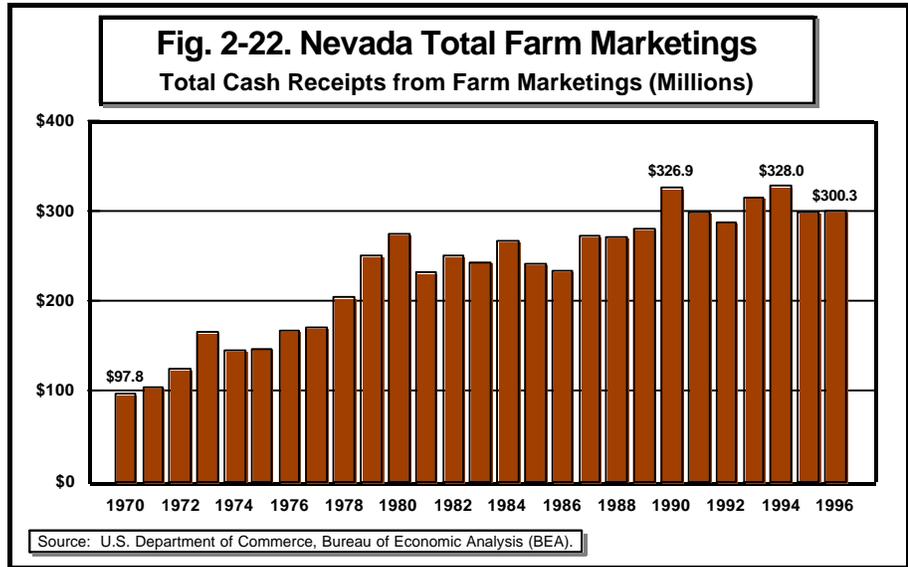
There has also been a more recent trend towards a strong statewide decline in on-farm workers and a growing importance of employment in related agricultural-related fields, primarily consisting of agricultural service workers, most typically representing the landscaping and lawn care service industries. From Table 2–7, workers involved in on-farm activities declined from 4,570 workers in 1974, comprising 77.5 percent of total agriculture and related employment, to 3,962 workers, or 30.2 percent of employment, by 1995. Meanwhile, workers in agricultural-related activities increased from 1,325 workers in 1974 (22.5 percent of employment in these fields) to 9,180 workers by 1995 (nearly 70 percent of total agricultural-related employment). In viewing the individual county agricultural-related figures (which are presented in Appendix 4 of the Appendices), particularly with respect to the amount of irrigated acreage, there appears wide fluctuations in estimated levels of irrigated acreage. Such fluctuations tend to indicate either highly volatile irrigation and crop production cycles or, more than likely, fundamental problems in reporting and gathering accurate data on this industry sector.

The volatility in historical measures of this industry, particularly with respect to irrigated acreage, related water usage rates and livestock figures, makes forecasting irrigation and livestock water use especially difficult. However, there does appear to be a trend towards no increase in agricultural lands being brought under cultivation and in some

counties, e.g., Carson City, Churchill, Douglas, and Washoe in particular, it appears that encroaching urbanization and the transfer of water rights to other uses, i.e., municipal and industrial, is causing the level of irrigated lands to actually decline. Given new and growing demands for limited water resources in the state, particularly for municipal use, wildlife protection and fishery restoration, instream flows and recreation, the future of agriculture in Nevada is somewhat uncertain.

Table 2–8. Nevada Forecasted Irrigated Acreage presents the Nevada Division of Water Planning’s forecasts for total irrigated acreage Nevada and the state’s principal agricultural counties. Nevada’s total irrigated acreage figures are based on individual county forecasts which were then aggregated to produce the statewide total. Forecasts of irrigated acreage are expected to show declines in all counties, with accelerated declines in the more urbanized counties, i.e., Washoe County in Table 2–8.

Table 2–8.
Nevada
Forecasted
Irrigated
Acreage
Selected Counties –
Estimated (1995) and
Forecasted (2000–2020)
Irrigated Acreage
(Acres)



Nevada/Selected Counties	1995	2000	2005	2010	2015	2020
Nevada Total Irrigated Acreage	715,440	727,500	715,563	700,742	683,247	665,753
Churchill County Irrigated Acreage	56,094	54,523	54,130	53,685	53,191	52,696
Douglas County Irrigated Acreage	38,640	37,877	37,266	36,554	35,746	34,937
Elko County Irrigated Acreage	213,903	214,007	211,077	207,396	203,001	198,606
Humboldt County Irrigated Acreage	142,558	144,936	141,487	136,988	131,536	126,084
Lyon County Irrigated Acreage	60,975	61,317	60,643	59,884	59,045	58,207
Pershing County Irrigated Acreage	27,368	29,079	28,441	27,688	26,831	25,974
Washoe County Irrigated Acreage	27,048	25,716	24,671	23,483	22,176	20,869

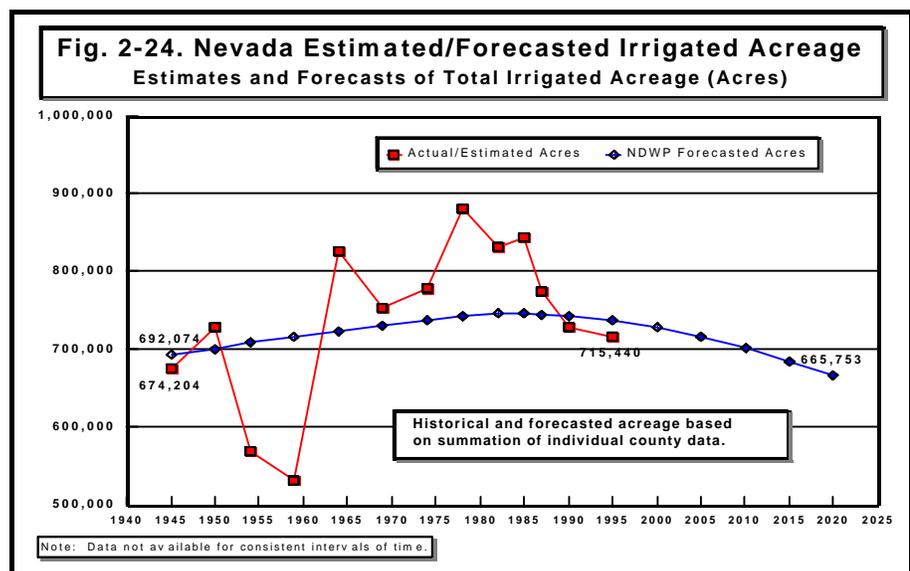
Notes: The selected counties presented above accounted for nearly 80 percent of Nevada’s total estimated irrigated acreage in 1995. Nevada totals are based on an aggregation of individual county estimates and forecasts of total irrigated acreage. Estimates of irrigated acreage for 1995 are based on U.S. Geological Survey (USGS) estimates, modified by the Nevada Division of Water Planning (NDWP) with modifications based on other source information (U.S. Department of Agriculture, Nevada Agricultural Statistics Service, and U.S. Department of Commerce, Bureau of Economic Analysis). County forecasts of irrigated acreage for 2000–2020 were based on NDWP forecasts derived from a non-linear “best fit” line for each county’s 1945–1995 data and then extrapolated out to the year 2000.

Source Data: 1995 irrigated acreage – USGS and NDWP; irrigated acreage forecasts – NDWP.

Fig. 2-24. Nevada Irrigated Acreage, shows both estimates of historical irrigated acreage since 1945 and the Division of Water Planning’s forecasts for Nevada’s total irrigated acreage through the year 2020 based on individual county forecasts which are aggregated to the statewide total. Detailed forecasts for all counties and the total state appear in Appendix 4 of the Appendices. Forecasts were based on the approximation of a non-linear “best fit” line which tracked historical trends and then was extrapolated (extended) out to the year 2020 based upon estimates of agricultural trends and other factors, for example urban encroachment.

Nevada’s Population and Employment Forecasts

Forecasted employment-to-population ratios for each county are crucial in forecasting employment levels from



the respective county’s population forecasts. This analysis and related statistical tests are presented in Appendix 3 of the Appendices for each county and aggregated for the total state. The resultant forecasts of county total employment, combined with estimated historical and commercial and industrial water use factors (gallons per worker per day), are then used to forecast each county’s commercial and industrial water withdrawals and, through aggregation, commercial and industrial water withdrawals for the total state.

Omitting the effects of national economic recessions, Nevada’s ratio of its total covered employment to its resident population have tended to be relatively stable over time. For the period of 1980-1997, Nevada’s ratio of its employment to population has averaged 48.2 percent. The average employment-to-population ratio, omitting recessionary periods, has tended to be closer to 50 percent. Nevada’s relatively high employment-to-population ratio is typical of an economy that is being driven primarily by commercial expansion and related strong employment growth. Also evident from an analysis of these trends is that Nevada’s employment-to-population ratio has shown marked sensitivity to national business cycle fluctuations, notably the U.S. recessionary periods of 1980-82 and 1990-91. While this point needs to be recognized, future recessions do not constitute any part of the forecasts for water withdrawals.

Another factor which would tend to affect the employment-to-population ratio is that as an economy “matures” and employment growth moderates relative to population growth, the trend towards household formation and a larger retired population component begins to affect this relationship, typically lowering the employment-to-population ratio over time. Changes in this relationship may also be influenced by changes in certain demographic factors, for example, changing birth rates (fertility rates) which would tend to alter the relationship between population growth and employment growth. Also, a change in the status of an area, for example, its appeal as a major retirement community, would tend to change the ratio of an area’s employment to population over time.

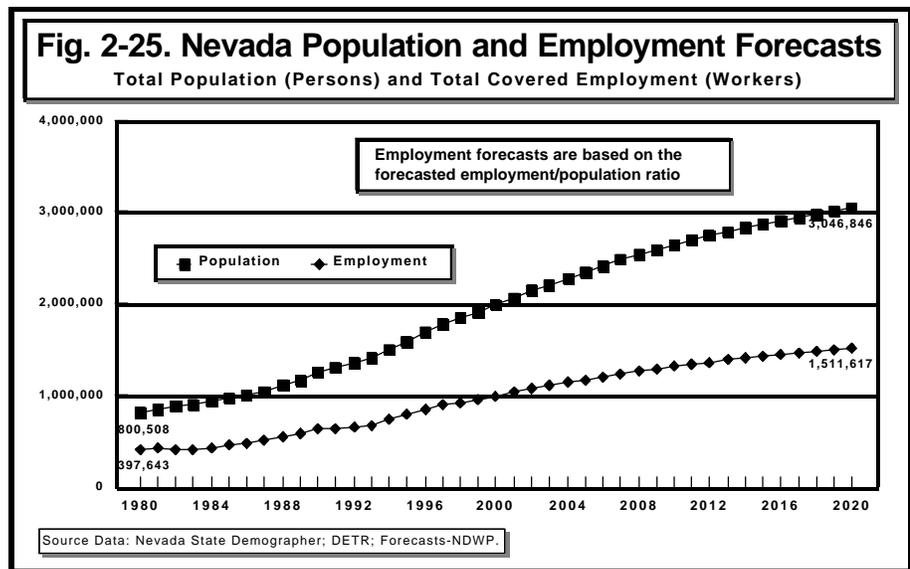


Table 2–9. Nevada Population and Employment Forecasts shows historical and forecasted population, employment and employment-to-population ratios for Nevada for selected years from 1997 through 2020. Unlike the forecast output tables which begin with the last estimated year of water withdrawal measures, i.e., 1995, this table uses 1997 to show the last year of population and employment estimates and hence the last actual measure of the employment-to-population ratio. A more extensive

presentation of this information for the total state and all counties for all years from 1980 through 2020 can be found in Appendix 3 of the Appendices. The information and forecasts in this appendix were based on historical levels and omit possible effects of future national and local recessions. Inputs on demographic trends and industrial development were also provided by the Nevada Department of Employment, Training and Rehabilitation (DETR).

Table 2–9. Nevada Population and Employment Forecasts

Population/Employment Estimates — 1997, NDWP Forecasts — 2000–2020

(Annual Averages — Persons and Workers)

NEVADA	1997	2000	2005	2010	2015	2020	1997-2020 Change	1997-2020 Percent Change*
Population	1,779,850	1,986,257	2,341,374	2,640,306	2,868,979	3,046,846	1,266,996	71.2%
Employment	888,574	987,950	1,162,764	1,310,176	1,423,256	1,511,617	623,043	70.1%
Employment-to- Population Ratio	49.9%	49.9%	49.8%	49.7%	49.7%	49.7%	–	-0.20%

Note: Changes in the employment-to-population ratios are measured in percentage points. The Nevada employment-to-population figure is based on the aggregation of individual county estimates (1997) and forecasts (2000–2020).

Source Data: Population estimates (1997) – Nevada State Demographer; employment estimates (1997) – Nevada Department of Employment, Training and Rehabilitation (DETR); population and employment forecasts (2000–2020) – Nevada Division of Water Planning (NDWP). Population forecasts for Clark County were provided by the Clark County Department of Comprehensive Planning; population forecasts for Washoe County were derived from forecasts adopted by the Washoe County Department of Community Development.

Fig. 2-25. Nevada Population and Employment Forecasts presents forecasts of Nevada’s population and employment through the planning horizon. Population forecasts are more fully presented in the Appendix 2 of the Appendices while the employment forecasts are presented in Appendix 3 of the Appendices and are derived from the forecasts of employment-to-population ratios developed for each county. The total state figures are obtained from an aggregation of the individual county estimates and forecasts.

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