Nevada County General Plan

Volume 2: Background Data and Analysis

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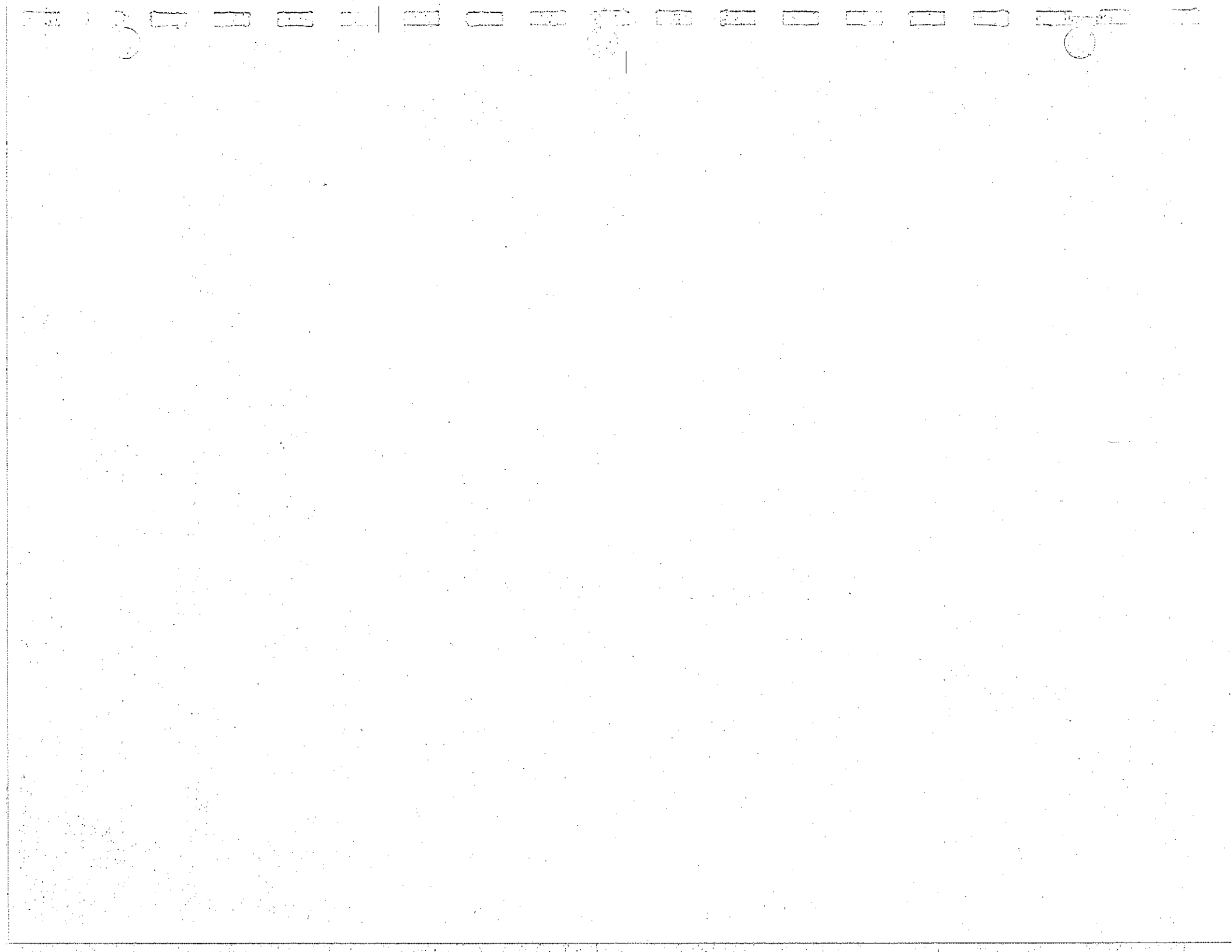

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Introduction

The General Plan

This volume of the Nevada County General Plan presents statutory required background data and analysis which supports the goals, objectives, and policies in the land use, housing, circulation, public facilities and services, noise, recreation, and open space chapters contained in Volume 1 of the General Plan. This volume includes the following sections:

Section 2: Housing
Section 3: Noise Analysis
Section 4: Open Space/Conservation Inventory
Section 5: Resource Capability Analysis
Section 6: Land Use, Circulation, and Infrastructure Analysis

Housing, Noise, Open Space, and Conservation are mandatory elements in a General Plan.

Section 2 on Housing includes background data and analysis of demographic characteristics, housing stock, housing needs, assisted housing, housing production opportunities, and production constraints. This section includes five appendices on technical and policy material.

This housing analysis, along with the goals, objectives, and policies set forth in Volume 1 meets the requirements for a "housing element" as set forth in the State Statutes.

Government Code Section 65583 mandates that the "housing element" shall consist of an identification and analysis of existing and projected housing needs and a statement of goals, policies, quantified objectives, and scheduled programs for the preservation, improvement, and development of housing. The housing element shall identify adequate sites for housing, including rental housing, factory-built housing, and mobile homes, and shall make adequate provision for the existing and projected needs of all economic segments of the community.

Government Code Section 65585 mandates that each local government shall consider the guidelines adopted by the department pursuant to Section 50459 of the Health and Safety Code in the preparation and amendment of its "housing element" pursuant to this article. Those guidelines shall be advisory to each local government in order to assist it in the preparation of its "housing element."

Government Code Section 65588 requires each local government shall review its housing element as frequently as appropriate to evaluate the appropriateness of its

housing goals in contributing to the attainment of the state housing goals, the effectiveness of the housing element in reaching these goals, and the progress the County has experienced in implementation of the housing element.

Section 3 on Noise provides the noise analysis required by State Statutes. This noise analysis along with the goals, objectives, and policies set forth in Volume 1 meets the requirements for a "noise element" as set forth in the State Statutes.

Section 65302(f) of the California Government Code mandates that the General Plan for each City contain a Noise Element which is designed to identify and appraise noise problems in the community. The State Office of Noise Control has established guidelines which require that current and projected noise levels be analyzed and quantified. Noise contours are required for noise sources, stated in terms of CNEL or Ldn and may be used as a guide for establishing a pattern of land uses that minimizes the exposure of community residents to excessive noise.

California Administrative Code, Title 21, Subchapter 6, establishes noise level criteria for airports in California. These regulations apply to the airport operator, and are enforced by the County.

Title 24 of the California Administrative Code regulated interior noise levels within multiple-occupancy dwellings affected by noise from traffic, aircraft operations, railroads and industrial facilities. The State Penal Code (Section 415) prohibits loud and unusual noise that disturb speech, while the Civil Code defines public nuisance which may be caused by noise. The California Environmental Quality Act includes noise as one of the factors in determining environmental impacts.

The California Vehicle Code sets noise emission standards for new vehicles, including autos, trucks, motorcycles and off-road vehicles. Performance standards are also applied to vehicles operated on public streets and roadways. Section 216 of the Streets and Highways Code regulates traffic noise as received at schools near freeways. The Harbors and Navigation Code regulates noise emissions from new motorboats and those operated in or upon inland waters.

Section 4 on the Open Space/Conservation Inventory includes background data and analysis on agricultural, biological, geological, hydrological, mineral, and recreational resources in the County. This inventory along with the goals, objectives, and policies set forth in Volume 1 meets the requirements for an "open space element" and "conservation element" as set forth in State Statutes.

Government Code Section 65302(d) requires a Conservation Element for the conservation, development, and utilization of a community's natural and manmade resources. Government Code Section 65560 requires the adoption of an Open Space element. Open space land is any parcel or area of land or water which is essentially unimproved and devoted to an open space use and which is designated on a local, regional or State open space plan.

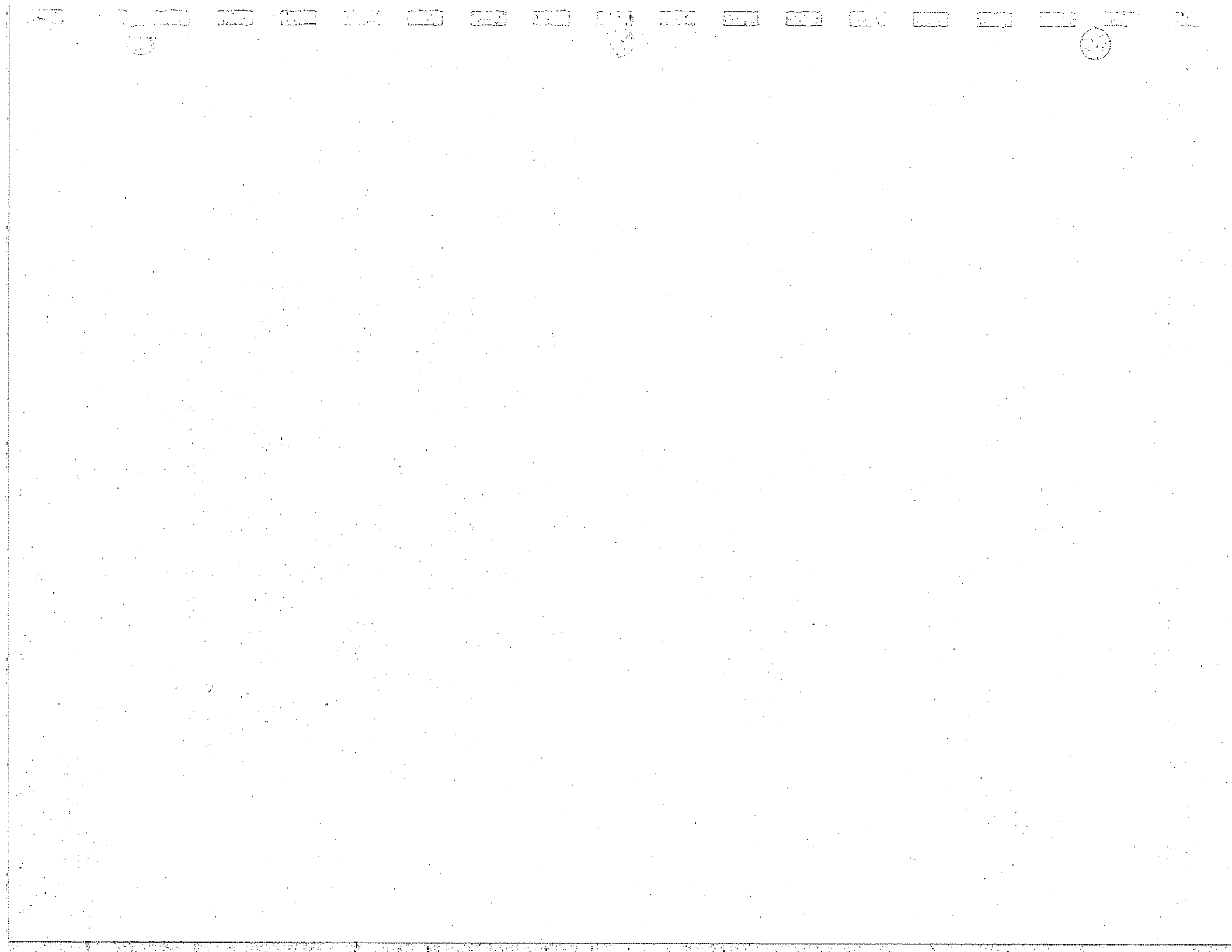
The Open Space/Conservation Inventory complies with Government Code Section 65563. An open space plan can be found in Volume 1, Section 2, Chapter 1: Land Use - Policies 1.16 and 1.17, Chapter 5: Recreation - Policy 5.20, Chapter 6: Open Space - Policies 6.1, 6.2, 6.3, 6.5, 6.8, and 6.9, and in Volume 1, Section 3, Chapter 13: Wildlife and Vegetation - Policies 13.1 and 13.6. Implementation

Measures 1 and 2 in Volume 1, Section 4, identify the specific action programs required to enforce this plan.

The Surface Mining and Reclamation Act (SMARA) was enacted to ensure that adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition; the production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment; and residual hazards to the public health and safety are eliminated. The inventory in this section addresses Nevada County's mining resources.

The State of California has adopted the California Endangered Species Act (CESA) as a mechanism to insure and/or encourage consultation with the California State Department of Fish and Game (DFG) when and where proposed projects may potentially affect State listed threatened or endangered species. The inventory in the section identifies habitats of endangered or threatened species.

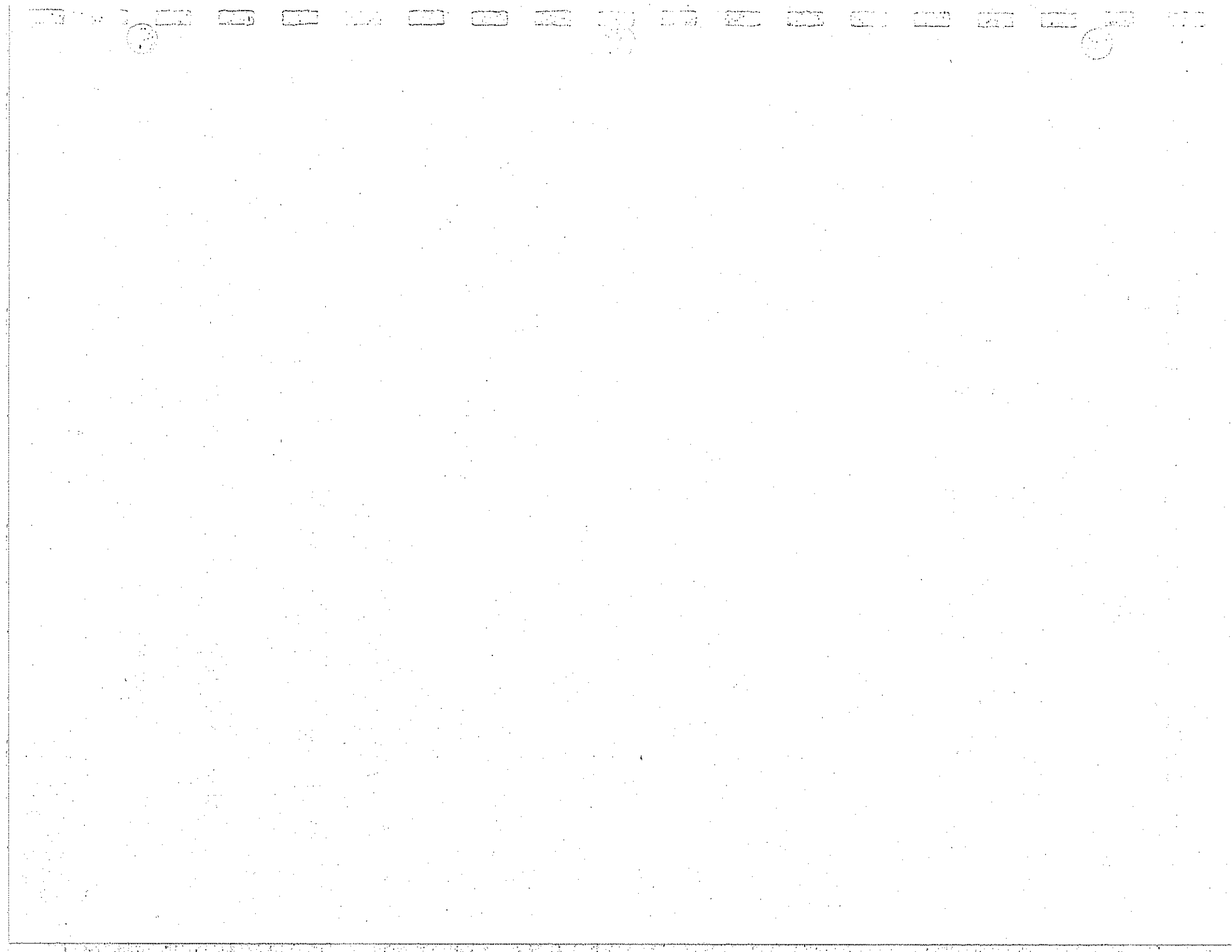
The Resource Capability Analysis in Section 5 and the Land Use, Circulation, and Infrastructure Analysis in Section 6 were basic tools used to develop the land use and circulation plans and supporting infrastructure plans.



Nevada County General Plan

Volume 2: Background Data and Analysis

Section 2: Housing



Summary

Demographic Characteristics

Population Growth. Nevada County's rate of population growth during the past 20 years has significantly outpaced California's growth rate. According to state projections, the county's growth will continue, although at a steadily decreasing rate.

The largest percentage gains from 1980 to 1990 were in census tracts 4 (92 percent), 1 (80 percent) and 2 (71 percent). These tracts are located in western half of the county and include such large developments as Lake Wildwood and Lake of the Pines. These areas, and tract 1 in particular, also have ready access to Highway 49.

Age. Compared to the population distribution for the state, Nevada County's population is skewed towards the higher age brackets. The county's percentage of persons over the age of 65 is double that of the state. This imbalance is most likely due to an influx of retirees who have established their primary residence in the county.

Household Growth. The largest percentage gains from 1980 to 1990 were in tracts 4 (103 percent), 1 (77 percent), and 2 (77 percent); the same tracts which recorded the largest growth rates for population. Approximately 30 percent of the 10,746 households established during the 1980s were in tract 1, while tract 4 accounted for almost 19 percent. Collectively, these two census tracts accounted for almost half of the county's household growth during the period.

Household Size. The average household size in the county has declined steadily over the past 20 years and is currently below the state average. The average household size in California is on the increase due to rapid growth in the number of Hispanic and Asian households. These ethnic groups, which tend to have larger households, comprise only a small portion of the county's population. The county also has many smaller households composed of retired individuals and couples without children.

Household Type. Family households comprised approximately 74 percent of all households in Nevada County. The county had a high percentage of married couple families with no related children. Given the large number of elderly in the county, it is likely that many of these families consist of married retirees whose grown children live outside the county.

Labor Force and Employment. During the past five years, the growth of Nevada County's labor force significantly outpaced that of the state. Similarly strong growth was evident in total employment. In comparison to the state, Nevada County had a very significant portion of its work force which was self-employed. Almost one-third of the county's work force was self-employed. Services and retail trade were the industries forecast by the state to have the greatest employment growth by 1996.

Jobs to Housing Balance. The ratio of jobs to housing in Nevada County (0.91:1) was well below both the theoretical balance of one job to one housing unit and the balances for adjacent jurisdictions. The county's ratio was also significantly less than the state-wide ratio of 1.23:1. This situation suggests the likelihood that many of the county's residents are employed outside the county.

Commuting Patterns. The 1990 Census indicates that approximately 7,652 Nevada County residents were employed outside the county. This figure represents 24 percent of workers reporting a place of employment.

Housing Stock Characteristics

Housing Unit Growth. During the 1970 to 1990 period, the rate of housing unit growth (i.e. supply) lagged slightly behind household formation (i.e. demand). This trend was most notably evident in Grass Valley and the unincorporated county. Although the total number of housing units in these areas in 1990 exceeded the total number of households, the comparison suggests that demand for housing in these areas is growing at a pace which exceeds supply.

The opposite situation existed in the eastern county. There, the percentage change in housing units was more than 88 percent, compared to household growth of about 66 percent. Moreover, there were more than two housing units for every one household in the eastern county.

Census tracts 4, 12 and 1 contributed 8,333 units or roughly two-thirds of the 12,593 units constructed during the 1980s. Tracts 1 and 4 accounted for approximately 40 percent of the total growth in the county's housing stock. Both tracts 1 and 4 are located in the rapidly growing, unincorporated portion of the western county, an area which includes the Lake of Pines and Lake Wildwood developments. Tract 12, which added more than 3,300 units to its inventory and accounted for more than one fourth of new units, includes Truckee and its surrounding area.

Home Ownership. The county's rate of home ownership was 74.4 percent, much higher than the state. The lowest rate of home ownership was in the city of Grass Valley, where about 41 percent of households were homeowners. This situation was understandable given that almost 40 percent of the county's multi-family units were located in Grass Valley.

Units in Structure. The share of single family units in the county has declined during the past thirty years from approximately 90 to 80 percent. In the 1980s, growth in multi-family units was flat and their share of the housing stock

dropped significantly from 13 to about 9 percent. In comparison, about one-third of the housing units in California are multi-family units.

In comparison to the state, the county has a significantly large share of its housing stock consisting of trailers and mobile homes. Although this type of housing is frequently found in rural areas, the high incidence of mobile homes in the county suggests that these units provide one source of affordable housing for county residents.

Seasonal Units. In 1980, seasonal units comprised slightly less than four percent of the county's total housing stock. By 1990, the number of seasonal units had almost quadrupled, increasing the percentage of seasonal units to almost 10 percent. Furthermore, seasonal units accounted for more than 20 percent of the new home construction that occurred during the 1980s.

Slightly more than half of the county's seasonal units were located in census tract 12.02, the area west of Truckee which includes the Tahoe-Donner subdivision.

Housing Age. In comparison to the state, the county's housing stock was relatively new. In comparison to homeowners, renters were more likely to live in older units. Specifically, more than one-fifth of the county's rental stock was constructed prior to 1940. This situation reflects the fact that many older single-family units are converted for use as rental units.

Vacancy Rates. Of the 37,352 housing units counted during the 1990 census, almost 6,600 or 17.7 percent were vacant. This vacancy rate was more than twice that recorded for the state. More than half of the 6,594 vacant units were recorded as seasonal vacancies (i.e., summer homes). Only about 850 of the almost 6,600 vacant units (13 percent) in the county were available to be either rented or sold. This relatively low number of available vacant units could result in limited choices for consumers, as well as higher rents and home prices.

Value of Owner-Occupied Homes. Owner-occupied units in the county generally were of lower value than those state-wide. The county-wide median value (i.e., the value above and below which lie 50 percent of all owner-occupied units values) in 1990 was $154,700, significantly below the state-wide median value of $195,500.

The tracts with the highest median values were also the tracts with the greatest gains in housing units during the 1980 to 1990 period. These tracts were also the only two in the county that produced median values comparable to California's.

Rents. The rents paid by county residents generally were lower than rents paid state-wide. The median contract rent paid in Nevada County was $72 per month less than the median value recorded for California.

There was a strong correlation between those census tracts with high median values for owner-occupied units and those with high median rents.

Housing Needs Assessment

Affordability and Overpayment. In Nevada County, as elsewhere, there was a high correlation between a household's income and the percentage of its income spent for housing. Lower income households generally paid high percentages of their incomes for housing while high income households tended to pay low percentages. The incidence of paying high percentages of income for housing was much higher for renters than for owners, particularly among the low income ranges.

Overpaying households comprised about 24 percent of all the households in the county in 1990. This percentage was very much in line with recent estimates of the percentage of overpaying households in California (i.e., 22 percent of all California households in 1989).

Overpaying was primarily a problem for renter households. In 1990, more than 81 percent of the county's renter households were lower income households with an overpaying problem. In contrast, only about 52 percent of the owner households were overpaying and low income.

Overcrowding. The incidence of overcrowding in Nevada County (3.7 percent) was significantly below the rate for California (12.3 percent). In absolute terms, the number of overcrowded units in the county grew from 881 in 1980 to 1,132 in 1990, an increase of 28.5 percent. Overcrowding was more prevalent in the county's rental housing than in owner-occupied housing.

Rehabilitation and Replacement. The state estimated that there were slightly more than 4,500 units in need of rehabilitation or replacement in 1989. This number was about 13 percent of the county's housing stock, the same percentage as for California. Nevada County's share of units in need was the lowest of all non-metropolitan counties and therefore, was substantially below the proportion for these counties taken as whole (22 percent). A recent county-wide survey of eleven communities found 1,814 units (29 percent of sample) in need of rehabilitation.

Low Income Households. In 1980, approximately 7,600 of the county's 21,019 households (38 percent) were low or very low income; meaning they earned less than 80 percent of the median income of $15,137. According to estimates prepared by the Sierra Planning Organization (SPO), the number of very low- and low-income households in 1990 was 11,264, an increase of about 48 percent.

Lower- and many moderate-income households could not afford housing valued above the 1993 median home value of $148,000.

Elderly. In 1990, the census recorded 14,251 persons over the age of 65 living in the county. Close to 80 percent of the elderly lived in the western unincorporated area of the county. An additional 15 percent resided in the city of Grass Valley. More than 40 percent of the county's elderly lived in one of five census tracts: 1.01 (8.9 percent), 1.03 (9.3 percent), 4.01 (10.0 percent), 5.1 (10.2 percent) and 8 (13.3 percent).

Disabled. An average of ten disabled persons per month request housing assistance through the FREED/Independent Living Center. FREED modified 20 homes for disabled individuals during 1991. There are no housing units in the county

intended specifically for disabled persons; however, licensed residential care facilities for the developmentally disabled are available.

Local agencies feel there was a need for clustered, group-care housing in Nevada County that would serve the developmentally disabled and provide a transitional step towards independent living.

Female Heads of Households. Family households headed by women numbered 2,345, and comprised 7.6 percent of all households. Compared to the percentage for the state (11.5 percent), the incidence of female heads of family households in the county was relatively low.

Large Families. The distribution of family households by size indicated that families in Nevada County typically are smaller than those throughout California. More than 50 percent of all family households in the county consisted of only two persons, in contrast to about 37 percent state-wide. It is likely that many of Nevada County's two-person family households consist of married couples who are retired.

Group Quarters. The growth in the number of persons living in group quarters (91 percent) significantly outpaced the population growth for the county (52 percent). The reason for this relatively high rate of increase was the 266 percent change in the number of non-institutionalized "other persons" in group quarters. Most likely, these individuals were residing in a commune.

Homeless Shelter and Transitional Housing. On average, between three and six families per week call the centers requesting accommodations. According to officials, the number of calls for housing assistance is on the rise in comparison to past trends. A third transitional living center has been opened to serve the previously unmet demand for transitional housing in the county. The center provides 35 beds.

Regional Housing Needs Plan. The draft Revised Regional Housing Needs Plan prepared by the Sierra Planning Organization allocates 100 percent of very low income households and 97 percent of other low income households to the unincorporated area of Nevada County and Town of Truckee. This draft allocation does not appear to consider the cost of providing affordable housing in areas that are either largely without public services or subject to high development costs.

The housing element's land use analysis must demonstrate that adequate land exists for the housing allocations within each income group. If the land is not available, the housing element must contain programs that can rectify land shortages.

Preservation of Assisted Housing

At-Risk Units. Four projects in Nevada County were determined to be technically at-risk of conversion to market rates. The actual risk of conversion was determined to be very small. Two non-profit housing corporations have expressed their interest in acquiring at-risk projects in Nevada County. The county does not have funds specifically allocated for the purchase of at-risk units.

Housing Production Opportunities

Existing Housing Sites. The existing general plan provides an abundant amount of residential land -more than 229,049 acres. Of this amount, only 29 percent or slightly more than 66,700 acres was determined to be developed based on the results of a county-wide land use survey conducted during 1991. The remaining 162,323 acres (71 percent) are vacant.

Housing Production Constraints

Land Costs and Availability. The county has experienced high rates of household and population growth that have created excess market demand. Housing costs in Nevada County were approximately 10 percent higher than in the surrounding Sacramento area. These higher housing costs were most likely associated with higher land costs.

Financing. Federal Deposit Insurance Corporation (FDIC) records for one local bank found no evidence of discriminatory practices or procedures, or other illegal credit practices. The FDIC indicated that the bank had not participated in any local community development or redevelopment projects and was not aware of any such projects being developed within its communities.

Construction Costs. According to the Construction Industry Research Board (CIRB), construction costs in Nevada County are actually lower than in Placer or Sacramento Counties. The data support the conclusion that Nevada County's higher land costs are the primary constraint to affordable housing development.

Infrastructure. The requirement that residential lots served by septic tanks be at least 3 acres in area if water is obtained from a well on the property or 1.5 acres if water comes from a treated supply or other source effectively ensures that residential development in much of the county will be low density.

The extension of sewage collection lines will be costly, since steep slopes, shallow soils, boulders and rock outcroppings are constraints which will result in higher-than-normal excavation costs.

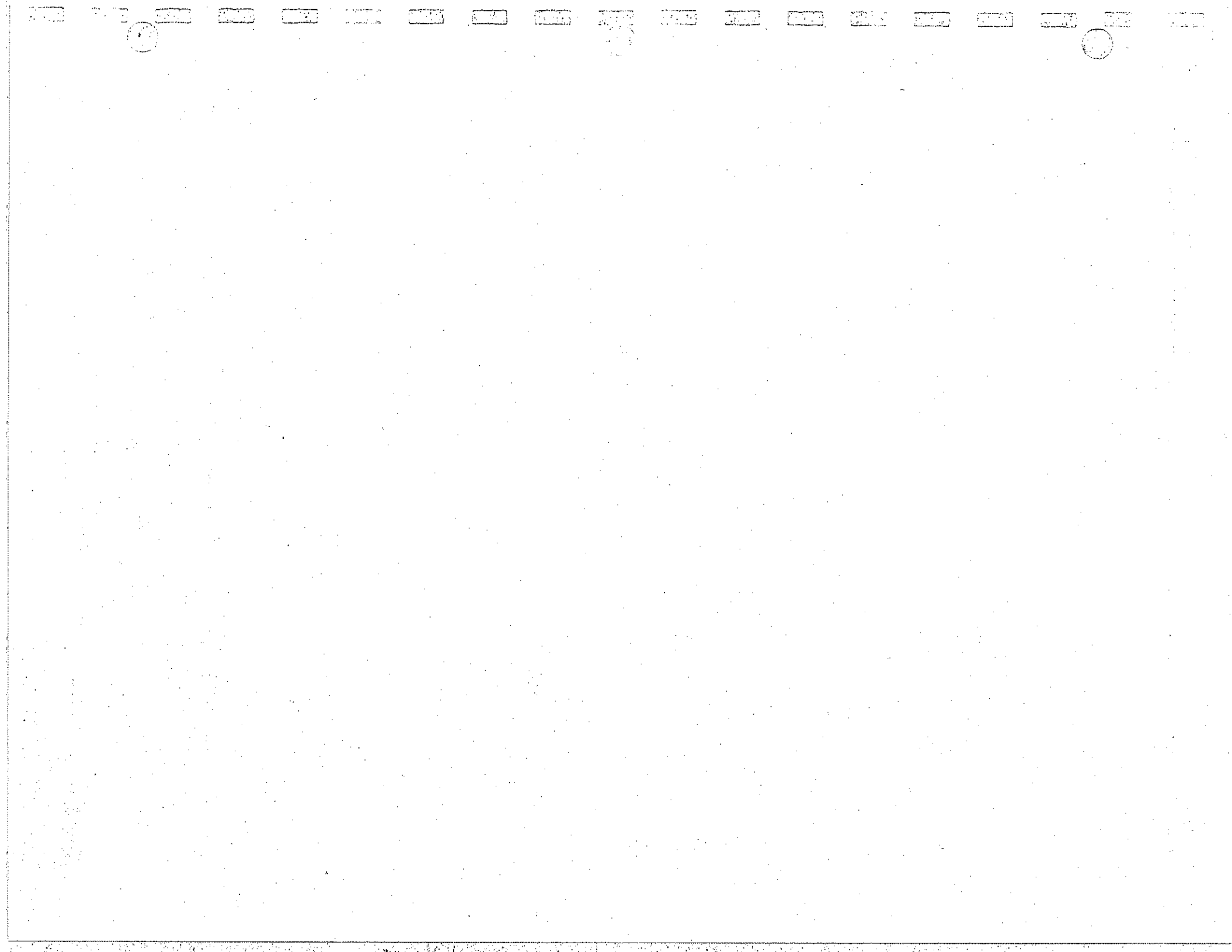
Codes and Enforcement. The county has implemented the provisions of the Uniform Building Code, Uniform Housing Code, Uniform Plumbing Code and National Electrical Code with certain amendments. The purpose of these amendments or modifications to the codes typically is to provide additional clarification or to take account of local conditions rather than to impede residential development.

Nevada County's zoning ordinance contains numerous features designed to increase the allowed density of residential development, such as allowing the construction of a second unit on a single residential parcel.

On- and Off-Site Improvements. The county requires residential development to pay at least a portion of its fair share of the cost of public facilities.

Requirements for roads, sewer, water and schools do not appear to pose constraints to the development of housing.

Fees and Exactions. The building permit and other fees charged by the county vary depending on the location of the site and the extent of construction required. In comparison to adjacent jurisdictions, the fees charged by the county appear to be reasonable.



Chapter 1 Introduction

Purpose

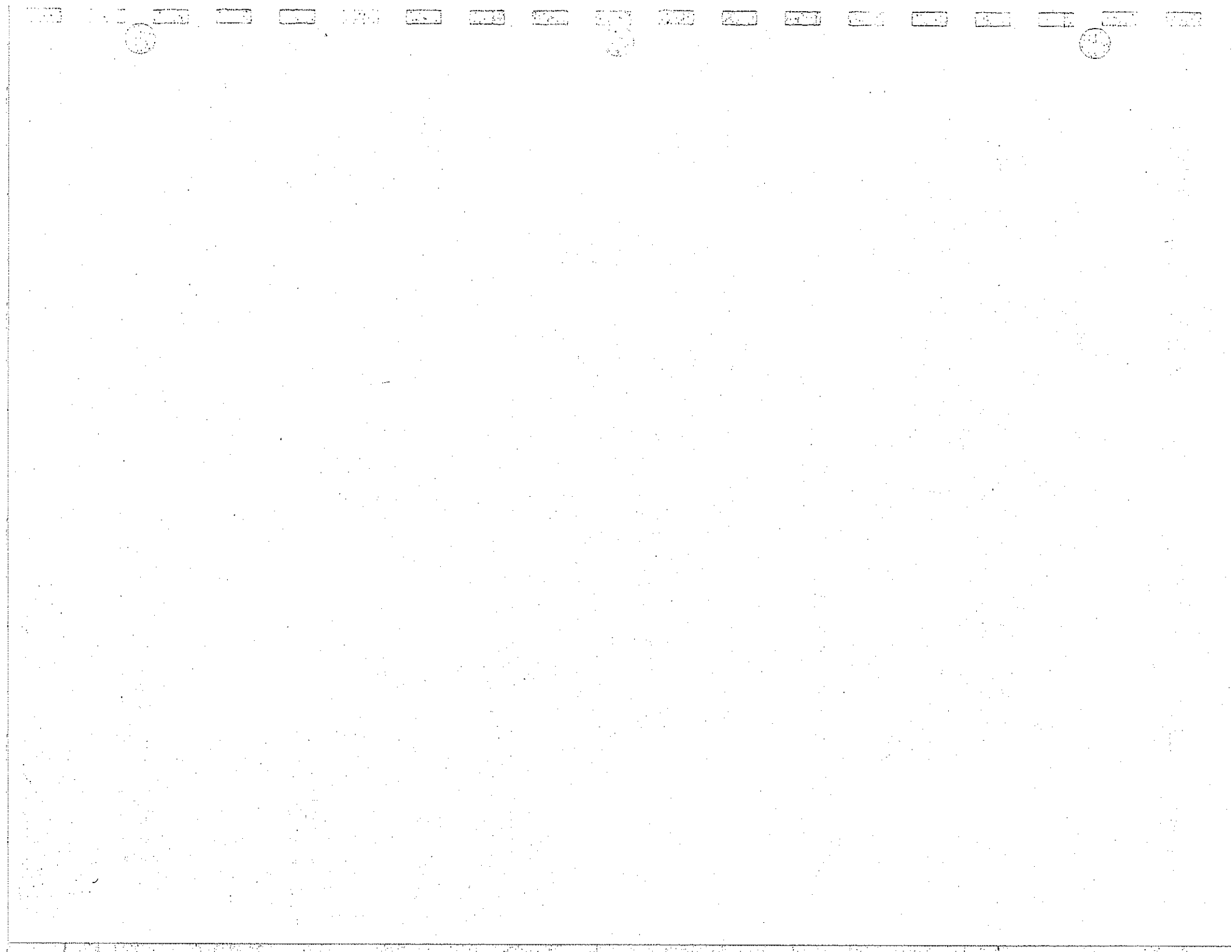
The purpose of this report is to document current housing needs and conditions and to provide the technical background information necessary to prepare the county's 1994 Housing Element, as part of a comprehensive update of the Nevada County General Plan. The report was prepared and organized to conform with state guidelines for the preparation of housing elements.

Scope and Approach

The data presented in this report was gathered from both published and unpublished sources, primarily from the 1992 Nevada County Housing Element and Nevada County General Plan Update process. No field surveys or inspections were conducted. Every effort was made to present factual data pertinent to the demographic, economic and social forces currently at work in Nevada County. All available data from the 1990 Census was used for analysis, particularly for historic trends County-wide and in specific areas. However, the 1990 Census does not provide direct information about the Town of Truckee, since the town's incorporation on March 23, 1993 occurred after census data were collected. Accordingly, where the census is used to analyze area characteristics, data for County *unincorporated area* and *Eastern County* include the Town of Truckee.

Relationship to the Housing Element

Under state planning law, counties are required to adopt a comprehensive, long-term general plan for their physical development. The housing element is one of seven mandatory elements of a legally adequate general plan. The housing element must identify and analyze existing and projected housing needs, and contain a statement of goals, policies, quantified objectives, and scheduled programs for the preservation, improvement, and development of housing. This report contains the analysis of existing and projected housing needs in Nevada County. The goals, objectives, policies, and implementation measures are contained in **Chapter 8: Housing** and **Section 5: Implementation Measures** of Volume 1 of the Nevada County General Plan, and are based on this technical report. Together, this section of Volume 2 and the two sections in Volume 1 of the General Plan comprise the 1994 Nevada County Housing Element.



Chapter 2 Demographic Characteristics

Population Characteristics

Population Growth

When viewed from a historical perspective, the trend of Nevada County's population growth has four distinct periods (See Figure 2.1). The first period was one of growth which occurred during the latter half of the 19th century, when the effects of the gold rush swelled the county's population to its peak of 20,823 in 1880. A period of gradual but steady population decline followed during the next six decades until the lowest recorded decennial population, 10,596 persons, was recorded in 1930. The post-Depression period lasted approximately thirty years and was one of relative stability and some growth. It was not until 1960, however, that the County's population finally surpassed the level recorded 80 years before during the 1880 Census. The final period, from 1970 forward, has been one of unprecedented growth, as people realized that Nevada County's true gold was its rural character and relative affordability. Consequently during the 1970s and 1980s, the county's population grew 96 and 52 percent, respectively.

The dramatic growth in Nevada County during the 1970 to 1990 period occurred primarily in the unincorporated area of the county (See Table 2.1). In the 1970 to 1980 period, the population of the unincorporated area grew approximately 125 percent, more than five times the increase for the incorporated areas. Although not as predominate, the same trend held true during the 1980 to 1990 period when the unincorporated area grew by almost 56 percent, in contrast to approximately 30 percent growth within the incorporated area. Although both the western and eastern county grew appreciably during the 1980s, it was the eastern county which grew at a greater rate (65.4 percent) than the unincorporated county as a whole (56.6 percent). The eastern county area that experienced the most growth is now within the incorporated Town of Truckee. Persons living in the unincorporated area (including Truckee) also increased as a share of the total population, rising from approximately 72 percent in 1970 to 82 percent in 1990.

Figure 2.1
NEVADA COUNTY POPULATION
1880 - 1990

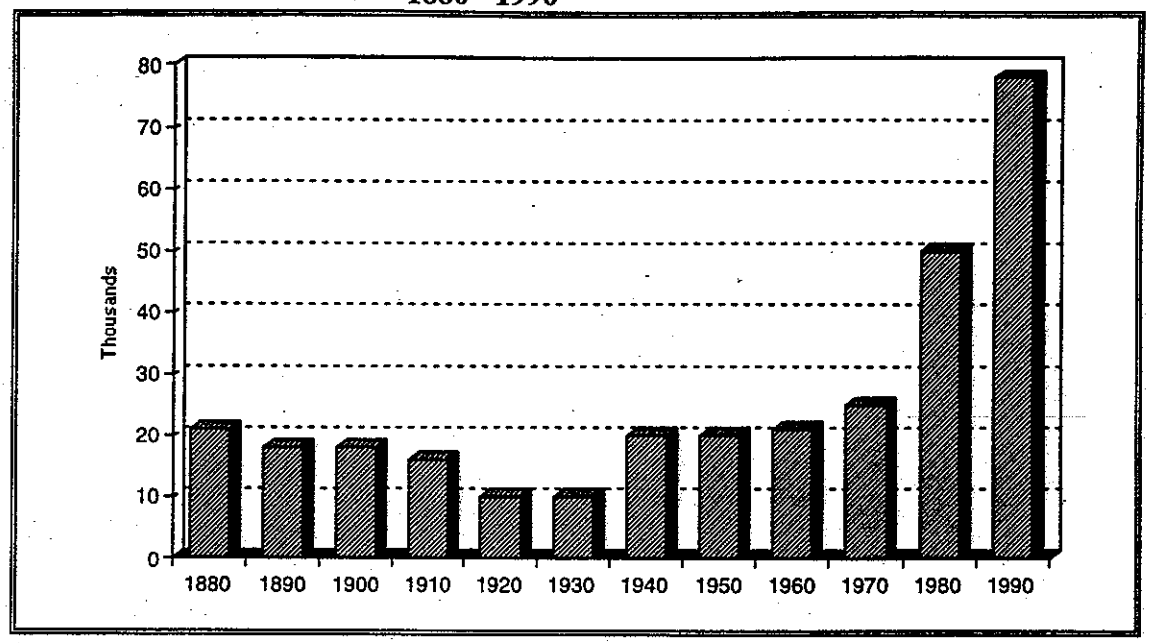


Table 2.1
POPULATION BY AREA
1970 - 1990

Area	1970	1980	Percent Change	1990	Percent Change
Incorporated Area	7,463	9,128	22.3	11,903	30.4
Nevada City	2,314	2,431	5.0	2,855	17.4
Grass Valley	5,149	6,687	30.1	9,048	35.1
Unincorporated Area	18,883	42,517	125.2	66,607	56.6
Western County		36,821		57,187	55.3
Eastern County		5,696		9,420	65.4
Nevada County	26,346	51,645	96.0	78,510	52.0

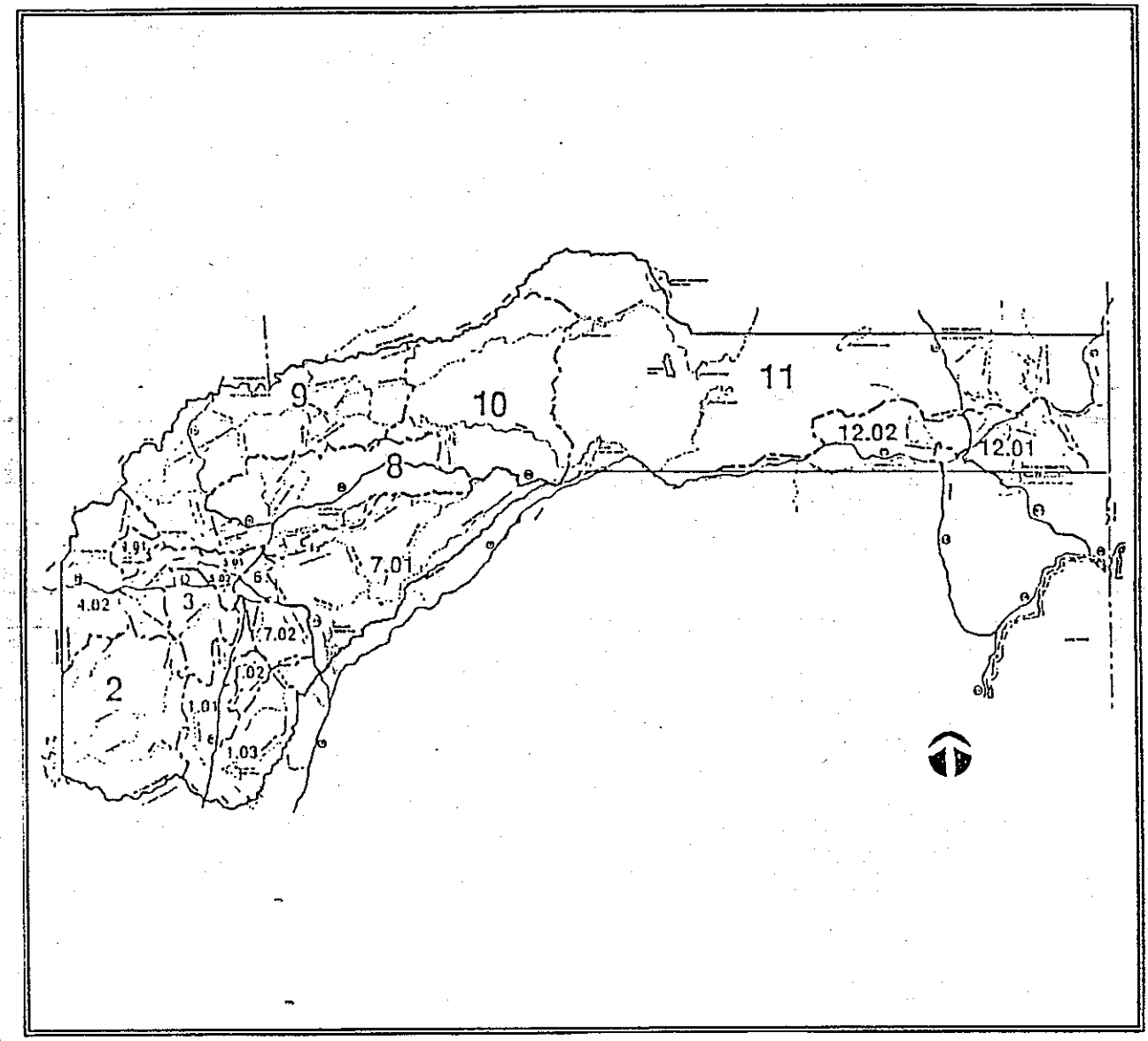
Source: U.S. Bureau of the Census, 1970, 1980, 1990.

The pattern of population increase in the unincorporated area of the county is more clearly revealed when viewed at the census tract level (See Table 2.2). For comparability, the county's 1980 and 1990 populations by census tract were standardized on the basis of 1980 census tract boundaries. Figure 2.2 depicts Nevada County's 1990 census tract boundaries. (Note: The county's 1990 census tracts, which are more detailed, are additive to the county's 1980 census tracts.)

The largest percentage gains from 1980 to 1990 were in tracts 4 (92 percent), 1 (80 percent) and 2 (71 percent). These tracts are located in western half of the county and include such large developments as Lake Wildwood and Lake of the Pines. These areas, and tract 1 in particular, also have ready access to Highway 49.

In this regard, it is interesting to note that the population growth of tract 1 (7,894 persons), accounted for roughly one third of the County's total growth during the 1980 to 1990 period. The census tracts which posted relatively minor increases in population include tracts 10 (9 percent), 6 (10 percent) and tract 5 (22 percent). Tract 10 is an area of relatively steep terrain that includes the Washington community. Tracts 5 and 6 include the city of Grass Valley and its surrounding area.

Figure 2.2
1990 CENSUS TRACTS



Age of Population

When compared to the population distribution for the state, it is apparent that Nevada County's population is skewed towards the higher age brackets (See Figure 2.3 and Table 2.3). This imbalance is most likely due to an influx of retirees who have established their primary residence in the county. For each age group beginning with the 45 to 54 year bracket, Nevada County's percentages were higher than those of

the state in every instance. Particularly apparent was the difference in the 65 to 74 year age group. In Nevada County, this age group accounted for roughly 11.5 percent of the population, almost double the proportion at the state level. Not surprisingly, the percentage of persons in Nevada County who were over the age of 65 was also much higher than the state-wide figure; 18 percent compared to 10.5 percent, respectively.

Table 2.2
POPULATION BY 1980 CENSUS TRACT
1980 - 1990

Census Tract	1980 Population	1990 Population	Percent Change
1	9,900	17,794	79.74
2	1,039	1,779	71.22
3	1,209	2,028	67.74
4	5,195	9,972	91.95
5	8,173	9,981	22.12
6	4,317	4,760	10.26
7	7,038	9,955	41.45
8	6,797	9,617	41.49
9	2,142	3,052	42.48
10	139	152	9.35
11	157	195	24.20
12	5,539	9,225	66.55
Total	51,645	78,510	52.02

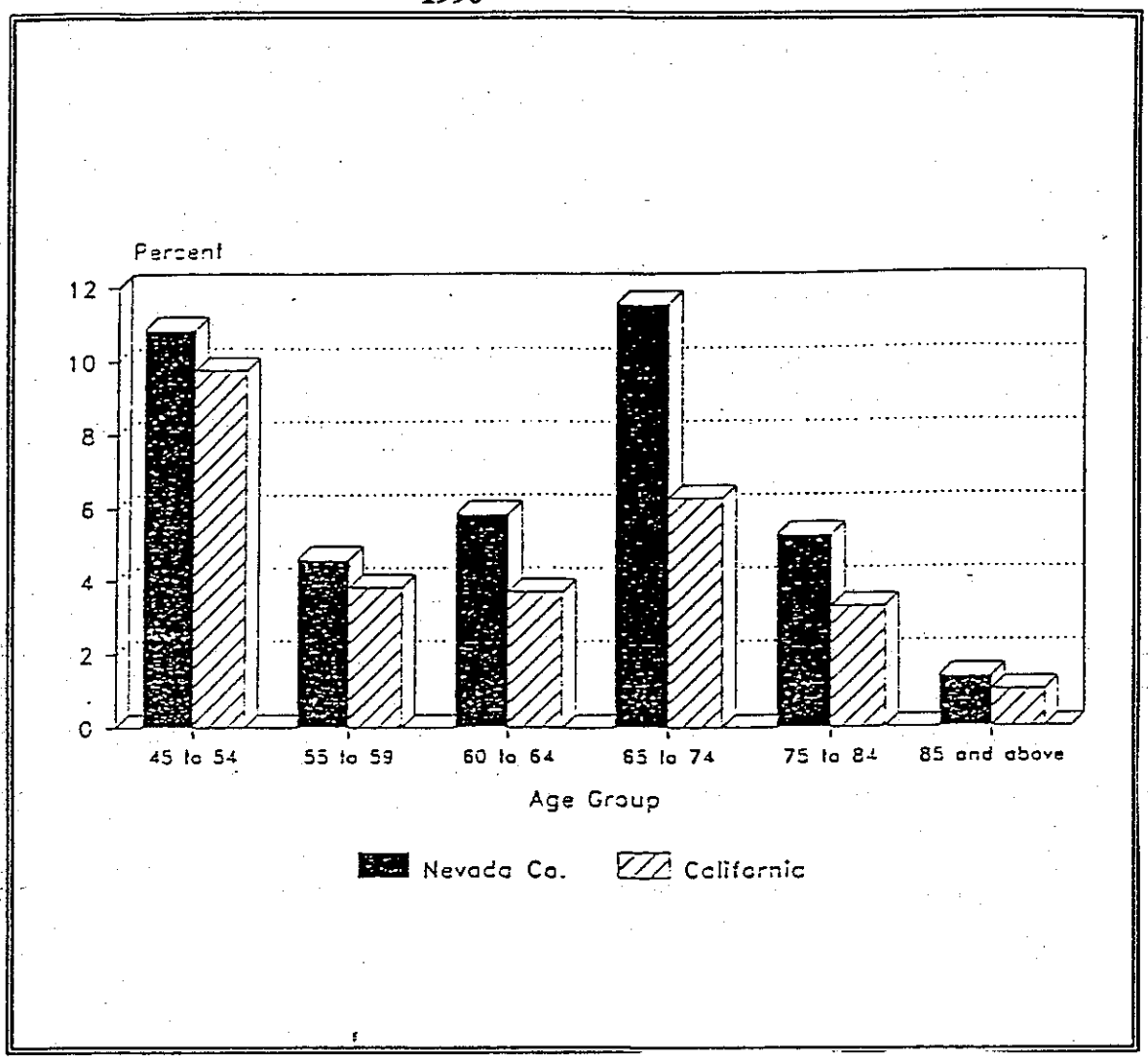
Source: U.S. Bureau of the Census, 1980, 1990.

Table 2.3
POPULATION BY AGE
1990

Age	Nevada County		California (Percent)
	Number	Percent	
Under 5 years	4,896	6.24	8.06
5 to 17 years	14,096	17.95	17.99
18 to 20 years	2,189	2.79	4.74
21 to 24 years	2,208	2.81	6.72
25 to 44 years	24,161	30.77	34.70
45 to 54 years	8,528	10.86	9.75
55 to 59 years	3,605	4.59	3.81
60 to 64 years	4,576	5.83	3.69
65 to 74 years	9,057	11.54	6.24
75 to 84 years	4,110	5.24	3.29
85 years and over	1,084	1.38	1.01
Total Population	78,510	100.00	100.00
Under 18 years	18,992	24.19	26.04
65 years and over	14,251	18.15	10.54

Source: U.S. Bureau of the Census, 1990.

Figure 2.3
PERCENT POPULATION BY AGE
1990



Population Projections

The population projections prepared by the California State Department of Finance reflect the assumption that other conditions being equal, Nevada County will continue to grow at a much greater rate than the state (See Table 2.4)[1]. In the case of both entities, however, population growth was projected to increase at a steadily decreasing rate. Nevada County's growth during the 1990 to 2000 period was projected to be 38.7 percent, down substantially from the 52.0 percent increase recorded during the previous decade. The growth for the period from 2000 to 2010 was projected to be even slower at 26.4 percent.

[1] This assumption has been made by both public and private forecasters. For example, the Center for the Continuing Study of the California Economy projected that Nevada County would grow at almost 2.5 times the state rate during the 1988 to 1995 period - making it the state's fifth-fastest growing county.

Table 2.4
POPULATION PROJECTIONS
1990 - 2020

Year	Nevada County		California	
	Number	Percent Change	Number	Percent Change
1990	79,600		29,976,003	
2000	110,386	38.7	36,443,857	21.6
2010	139,488	26.4	42,408,137	16.4
2020	168,372	20.7	48,976,518	15.5

Source: California State Department of Finance, Report 93 P-3; 1993.

Although the state data did not provide a breakdown between the western and eastern county, one can be developed based on the assumption that the areas' relative shares of total population in 1990 will remain the same during the projection period. Using this assumption, the western county's projected population in 2000 and 2010 would be 79,318 and 100,258, respectively. The projected population of the eastern county, consisting predominantly of the Town of Truckee, would be 13,066 and 16,515 for the same periods.

Figure 2.4 depicts three alternate projections for the County's population growth through the year 2025. Two of the projections were based on simple growth rates of 1.5 and 5.0 percent per year. Five percent growth per year was selected for the high projection based on the county's estimated growth rate during the 1985 to 1990 period (i.e., 5.07 percent). The low projection of 1.5 percent was based on the slower state growth rate during the 1990 to 1995 period (i.e., 1.47 percent). The third projection was a logistic (S-shaped) curve[2] which takes into account the ultimate build-out population of the county as an upper limit. The shaded area between the low and high projections represents the possible range of future population growth.

The population projections prepared by the State Department of Finance are comparable to the ones produced by the logistic curve, since both have the County's population growing at a decreasing rate. For example in the year 2000, the two projections are within three percent of one another. By 2005, the projections are slightly more divergent, but still within five percent. A reasonable forecast for future population growth would seem to be one which includes a gradual reduction in the county's rate of growth over time. For purposes of this report, the future populations projected by the logistic curve were assumed to be an adequate forecast of population growth.

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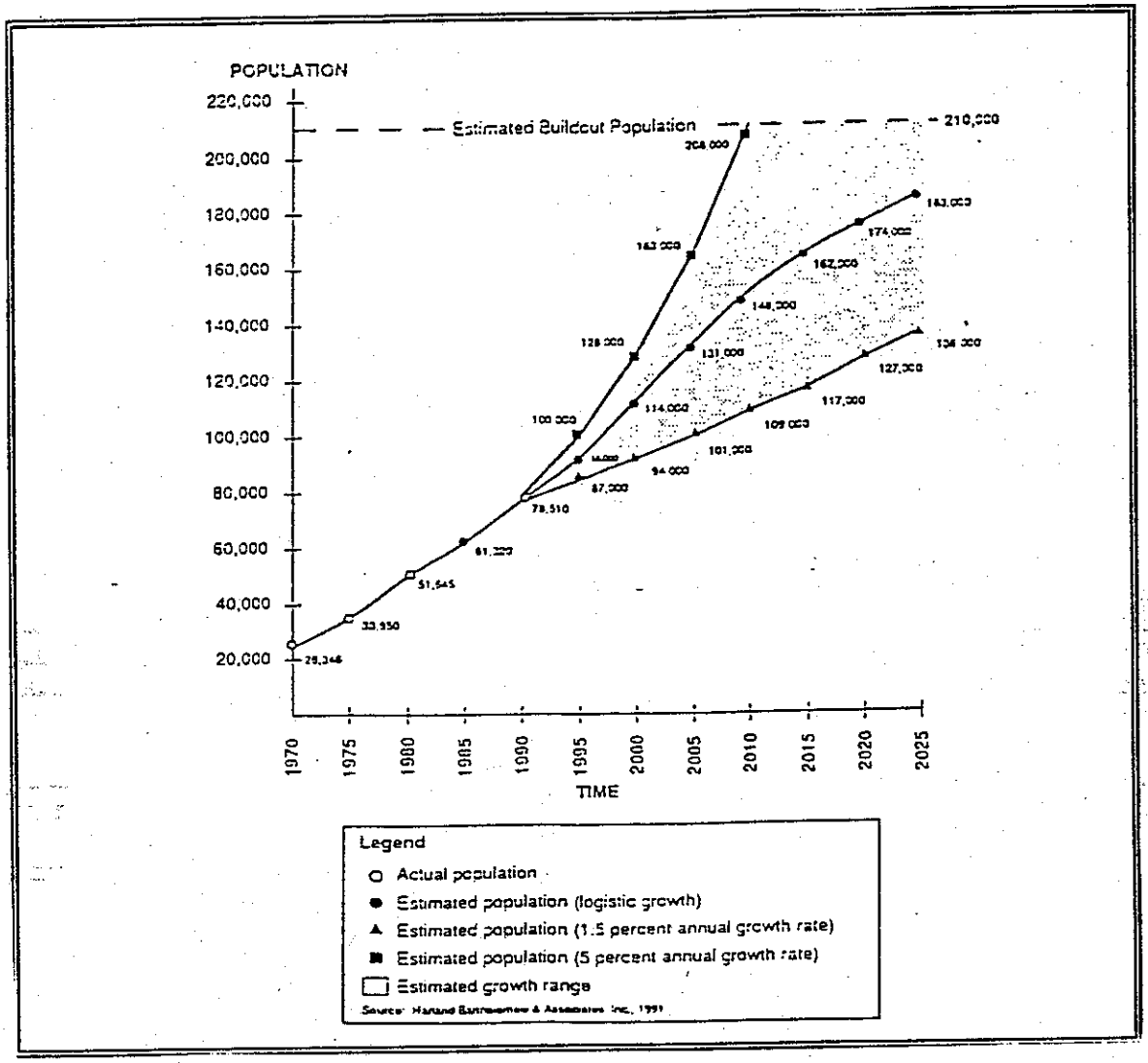
[2] The general mathematical form of the logistics curve is:

$$P_{t+x} = \frac{k}{1} + ae^{bx}$$

where: P_{t+x} = population of the area at any year $t+x$;
x = number of years from base year t to the forecast year $t+x$;
k = an upper population limit;
a = actual population at base year t;
b = a negative constant; and
e = the natural log, 2.71828.

Figure 2.4
NEVADA COUNTY POPULATION PROJECTIONS
1995 - 2025



Household Characteristics

Household Growth

Growth in the number of households is of critical importance for housing, since one household is the equivalent of one occupied housing unit. During the past 30 years, the number of households in the county has increased substantially. As depicted in Table 2.5, this growth has generally outpaced household formation at the state level by a wide margin, particularly during the past two decades. Although the rate of household growth in Nevada County was high, it corresponded closely to the equally high rate of increase in population. This situation is illustrated in Figure 2.5.

Table 2.5
HOUSEHOLD GROWTH
1960 - 2010

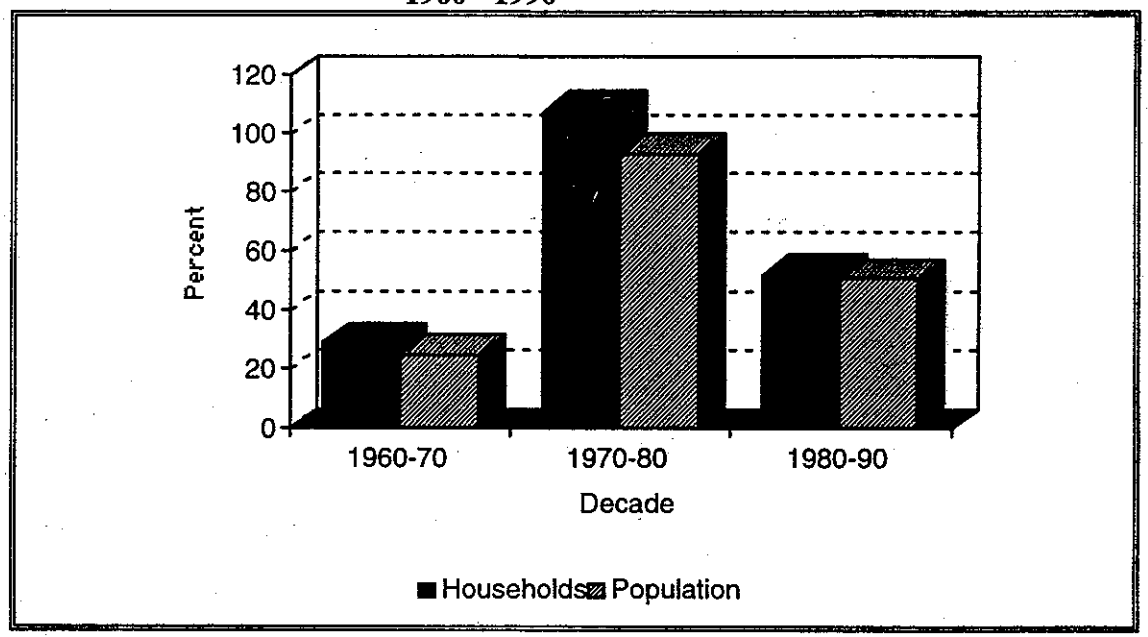
Year	Nevada County		California	
	Households	Percent Change	Households	Percent Change
1960	7,430		4,982,108	
1970	9,601	29.2	6,573,861	31.9
1980	20,012	108.4	8,629,866	13.1
1990	30,758	53.7	10,381,206	20.3
2000	43,500	41.4	12,731,000	22.6
2010	50,600[1]	28.7	14,900,000[1]	17.0

Notes: [1] Straight line projection; year 2010 projection not available from DOF.

Source: U.S. Bureau of the Census, 1960, 1970, 1980, 1990.

The state has projected that the county's relatively high rate of household formation will continue through the year 2010. As with population, the projections assume that the number of households will increase at a decreasing rate.

Figure 2.5
PERCENTAGE OF HOUSEHOLD AND POPULATION GROWTH
1960 - 1990



As demonstrated in the preceding section, it was the unincorporated portion of Nevada County which registered the largest increases in population during the past twenty years. Therefore, it was no surprise that a similar trend held true for household formation. For example, during the 1980 to 1990 period, the number of households in the unincorporated area grew by almost 60 percent, roughly double the percentage increase recorded for the incorporated areas of the county (See Table 2.6).

The importance of the unincorporated area is also demonstrated by examining the area's share of total household growth. During the 1980s, the number of

households in the county increased by 10,746. Of these, more than 9,400 (88 percent) were established in the unincorporated area.

Table 2.6
HOUSEHOLDS BY AREA
1980 - 1990

Area	1980	1990	Percent Change
Incorporated Area	4,096	5,437	32.74
Nevada City	1,059	1,289	21.72
Grass Valley	3,037	4,148	36.58
Unincorporated Area	15,916	25,321	59.09
Western County	13,834	21,857	57.99
Eastern County	2,082	3,464	66.38
Nevada County	20,012	30,758	53.70

Source: U.S. Bureau of the Census, 1980, 1990.

At the census tract level, the largest percentage gains from 1980 to 1990 were in tracts 4 (103 percent), 1 (77 percent), and 2 (77 percent); the same tracts which recorded the largest growth rates for population (See Table 2.7 and Table 2.2). Approximately 30 percent of the 10,746 households established during the 1980s were in tract 1, while tract 4 accounted for almost 19 percent. Collectively, these two census tracts accounted for almost half of the county's household growth during the period. On a percentage basis, tracts 6, 10 and 5 were the areas of little growth; each tract had less than a 25 percent increase in households during the decade.

Table 2.7
HOUSEHOLDS BY 1980 CENSUS TRACT
1980 - 1990

Census Tract	1980 Households	1990 Households	Percent Change
1	3,678	6,814	85.26
2	351	620	76.64
3	428	740	72.90
4	1,964	3,981	102.70
5	3,502	4,340	23.93
6	1,887	2,166	14.79
7	2,558	3,743	46.33
8	2,703	3,806	40.81
9	795	1,007	26.67
10	64	77	20.31
11	53	75	41.51
12	2,029	3,389	67.03
Total	20,012	30,758	53.70

Source: U.S. Bureau of the Census, 1980, 1990.

Household Size

In keeping with the national trend towards smaller households, the average household size in the county has declined steadily over the past 20 years (See Table

2.8). The 1990 U.S. Census determined there were 2.4 persons per dwelling unit for the western county, and 1.8 persons per dwelling unit for the eastern part of the county (including the Town of Truckee). While the tendency for the so called "baby boomers" to delay having children is one possible reason for this decline, it is also likely that an influx of retired individuals and couples without children is another contributing cause. This same reason may also explain why the county's average number of persons per household was consistently below the state average. It is also interesting to note that the county's average declined in 1990, while the state average recorded a substantial increase. The state increase was most likely due to rapid growth in the number of Hispanic and Asian households state-wide. These ethnic groups, which comprise only a small portion of the county's population, tend to have larger households. The Department of Finance has projected that this difference in household size will persist through the year 2000.

Table 2.8
AVERAGE HOUSEHOLD SIZE
1970 - 2000

Area	Average Persons Per Household			
	1970	1980	1990	2000
Nevada County	2.6	2.55	2.51	2.50
California	2.9	2.68	2.79	2.77

Source: U.S. Bureau of the Census, 1970, 1980, 1990; State of California Department of Finance, Report 91 P-2, May, 1991.

Household Type

Table 2.9 compares the percentage of households by type and size in Nevada County to the state. Family households comprised approximately 74 percent of all households in Nevada County. At the state level, the figure was somewhat lower (69 percent), due primarily to a greater percentage of one person households. In particular, Nevada County had a substantially higher proportion of married couple families than the state; 63 percent versus 53 percent, respectively. One reason for this situation was the county's high percentage of married couple families with no related children. Given the large number of elderly in the county, it is likely that many of these families consist of married retirees whose grown children live outside the county.

It was interesting to note that the county's proportion of single parents, both male and female (10.5 percent), was considerably below the percentage recorded at the state level (16.1 percent). Although the reasons for this are not entirely clear, the incidence of female heads of households, for example, is generally higher in black and Hispanic households, two racial groups which comprised only 4.4 percent of the county's total population.

Table 2.9
HOUSEHOLD SIZE AND TYPE
1990

Household	Nevada County	California
One Person		
Male Householder	8.3	10.3
Female Householder	12.4	13.1
Two or More Persons		
Family Households		
Married Couple Family		
With Related Children	24.8	26.9
No Related Children	38.3	25.8
Other Family		
Male Householder, No Wife Present		
With Related Children	1.9	2.4
No Related Children	1.0	2.2
Female Householder, No Husband Present		
With Related Children	5.4	7.6
No Related Children	2.2	3.9
Non-Family Households		
Male Householders	3.3	4.8
Female Householders	2.2	3.0
Total Households	30,758	10,381,206

Source: U.S. Bureau of the Census, 1990.

Employment Characteristics

Labor Force

During the past five years, the growth of Nevada County's labor force significantly outpaced that of the state. From 1988 to 1992, the county's labor force increased by almost 6,400 persons, according to estimates prepared by the State of California Employment Development Department. On a percentage basis, growth in the county's labor force was almost three times more than the state during the five year period.

Similarly strong growth was evident in total employment. During the period, the number of employed persons in the county grew by almost 4,900 persons, an increase of slightly more than 20 percent. Again, the County's rate of job growth was over three times the state growth rate.

Table 2.10
ANNUAL AVERAGE LABOR FORCE, EMPLOYMENT AND UNEMPLOYMENT
1988 - 1992

Component	1988		1992		Percent Change	
	Nevada County	California	Nevada County	California	Nevada County	California
Labor Force	30,900	14,133,000	37,250	15,187,000	20.55	7.46
Employment	29,000	13,385,000	33,900	13,805,000	16.90	3.14
Unemployment	1,900	748,000	3,350	1,382,000	76.32	84.76
Unemp. Rate	0.061	0.053	0.090	0.091		

Source: California Employment Development Department, Report 400R-N, 1986, 1993.

Employment by Industry

From 1988 to 1992, approximately 4,900 new jobs were created in Nevada County. Of this total, about 3,225 jobs (66 percent) were created by industries paying wages and salaries. The industries which accounted for most of the new employment growth were services (1,275 jobs), retail trade (675 jobs), and government (625 jobs). The largest sectors of the county's employment base were retail trade and services, which combined to employ about one-half of the county's wage earners. Other important industrial sectors in the county's economy included government (i.e., local government, schools) and manufacturing. While the county's light manufacturing base has been a significant source of new employment in high technology, electronics and other related fields, job losses during 1992 exceeded previous growth in this sector from 1988 to 1991.

According to data compiled by a local Chamber of Commerce, a very significant portion of the work force in Nevada County is self-employed. As of 1991, this group comprised almost one-third of the county's work force. Although this percentage decreased slightly during a five-year period from 1985 to 1989, it was still much higher than the state-wide proportion of between five and six percent self-employed. While the county's high level of self-employment in part reflects its citizen's entrepreneurial spirit, workers at the Chamber indicate wage and salary employment typically offers higher wages and better benefits than are available to self-employed persons. (Note: the state Employment Development Department does not maintain statistics on the occupations of self-employed persons.)

Over the next few years, state officials have projected economic growth in the county to continue, but at a slightly slower pace that will parallel the slowdown of California's economic growth. This growth, coupled with continued population growth in the area, was expected to result in a significant employment increase in the county. According to forecasts prepared by the state Employment Development Department, wage and salary employment was projected to increase from 19,925 to 23,375 jobs (17.3 percent) between 1989 and 1996 (See Figure 2.6).

Figure 2.6
EMPLOYMENT BY INDUSTRY
1989 - 1996

Error! Not a valid embedded object.1989 Non-Agricultural Employment
N=19,925

Error! Not a valid embedded object.1996 Non-Agricultural Employment
N=23,375

Source: *Annual Planning Information, Nevada County*, State of California Employment Development Department, June 1991.

Table 2.11
ANNUAL AVERAGE WAGE & SALARY EMPLOYMENT
BY INDUSTRY
1988 - 1992

Industry	Percentage of Employment				
	1988	1989	1990	1991	1992
Agriculture	50	50	50	50	75
Construction, Mining	1,525	1,675	1,950	1,900	1,625
Manufacturing	2,850	3,025	3,150	3,150	2,650
Trans. & Utilities	525	525	550	550	550
Wholesale Trade	325	375	525	600	650
Retail Trade	4,450	4,650	4,900	5,175	5,125
F.I.R.E.[1]	925	1,100	1,125	1,225	1,375
Services	4,575	4,875	5,225	5,525	5,850
Government[2]	3,550	3,725	3,950	4,000	4,175
Total	**18,800**	**20,000**	**21,450**	**22,175**	**22,025**

Notes: 1 Finance, Insurance and Real Estate (F.I.R.E).
2 Includes all civilian employees of federal, state and local governments, regardless of the activity in which the employee is engaged.

Source: California Employment Development Department, Report 400R-N, 1986, 1993.

Services and retail trade were the industries which should experience the greatest employment growth. Services and retail trade were expected to increase by 1,375 and 900 jobs, respectively. The projected increase in service employment was based on the assumption that the business community would respond to the needs of the county's growing population. Health care services were expected to lead this increase based on increases in the county's population and average age. The expansion of retail trade employment was also the result of a continued increase in demand for goods and services (in particular, eating and drinking establishments) brought on by the county's expanding population. Government and manufacturing were expected to show moderate growth based on employment gains of 575 and 425 jobs, respectively. Government, currently the third largest industry in the county, was expected to experience most of its growth in the local education segment due to a projected increase in the number of school-age children. Manufacturing was projected to sustain most of its growth in those manufacturing establishments not engaged in the production of lumber and wood products.

Little or no growth was expected by the Employment Development Department in the remaining industry divisions. The finance, insurance and real estate (F.I.R.E.) industry was forecast to increase by 150 jobs, largely due to demand resulting from the rising number of county residents. Wholesale trade was projected to expand slightly as a result of increases in retail employment. The number of jobs in transportation and public utilities was expected to decline slightly throughout the projection period.

Jobs to Housing Balance

In theory, a jobs to housing balance is achieved when there is a match between the number of jobs and housing units in an area. More specifically, this balance would match the number of housing units in each price range with the income levels of the jobs which were available in the area. Numerous benefits have been ascribed to the attainment of a jobs to housing balance including:

- an increase in quality, affordable housing for all income levels;
- a reduction in commuter vehicle traffic and correspondingly, air pollution;
- a reduction in commuter travel times;
- an increase in opportunities for alternative modes of transportation; and
- the achievement of social objectives, such as relief from class segregation and a greater sense of community among residents.

The jobs to housing balance typically has been expressed as the ratio of jobs to housing units. Thus the ratio of 1:1 represents one job for each housing unit. In accordance with the national trend of more than one wage earner per household, the actual balance will typically exceed the 1:1 ratio. Two studies conducted for adjacent Placer County have determined that the appropriate jobs to housing balance ranges from a low of 1.23:1 to a high of 1.6:1.

Table 2.12 contains a preliminary jobs to housing calculation for Nevada County. As shown, the resulting ratio was well below both the theoretical balance of one job to one housing unit and the previously cited balances (i.e., 1.23:1 and 1.6:1) for adjacent jurisdictions. The county's ratio was also significantly less than the state-wide ratio of 1.23:1.

Table 2.12
JOBS TO HOUSING BALANCE BY AREA
1990

Area	Population	Employment[1]	Housing Units[2]	Ratio
Incorporated Area	11,903	5,075	5,784	0.88:1
Nevada City	2,855		1,399	
Grass Valley	9,048		4,385	
Unincorporated Area	66,607	25,600	31,568	0.81:1
Nevada County	78,510	30,765	37,352	0.82:1
California	29,760.0	13,780.0	11,182.9	1.23:1

Notes: [1] Employment estimates are 1989 annual averages.
[2] Total housing units from 1990 Census.

Source: U.S. Bureau of the Census, 1990; California Employment Development Department, Report 400R-N, 1990.

As will be demonstrated in the upcoming analysis of housing vacancy rates (Section 3.3), Nevada County's housing inventory contains numerous units which are seasonally vacant. These seasonal units typically are owned by persons whose year-round residence is outside of the county. Therefore, including the large number of seasonal units in the jobs to housing equation may provide a misleading assessment of the relationship between jobs and housing in the County. Table 2.13 presents a revised jobs to housing unit calculation which uses year-round (i.e., all occupied units plus vacant units intended for year-round use), rather than total, housing units.

Table 2.13
REVISED JOBS TO HOUSING BALANCE BY AREA
1990

Area	Population	Employment[1]	Housing Units[2]	Ratio
Incorporated Area	11,903	5,075	5,736	0.88:1
Nevada City	2,855		1,371	
Grass Valley	9,048		4,365	
Unincorporated Area	66,607	25,600	28,121	0.91:1
Nevada County	78,510	30,765	33,857	0.91:1
California	29,760.0	13,780.0	10,987.5	1.25:1

Notes: [1] Employment estimates are 1989 annual averages.
[2] Total housing units minus seasonally vacant units from 1990 Census.

Source: U.S. Bureau of the Census, 1990; California Employment Development Department, Report 400R-N, 1990.

The use of year-round housing units in the calculation of the jobs to housing balance had no effect on the ratio for the incorporated area. This was not surprising, since seasonal units are only a small percentage of the housing stock. On the other hand, the ratios for the unincorporated area and the county as a whole rose significantly from about 0.8:1 to 0.9:1. Even with this increase, the jobs to housing ratio for the county was still markedly below the ratio for California of 1.25:1. Even accounting for households comprised of retirees, this situation suggests the likelihood that many of the county's residents are employed outside of the county.

Currently available evidence of commuting patterns by Nevada County residents suggests that a substantial number of persons from Nevada County work elsewhere. The 1980 Census recorded that 21.2 percent of workers 16 years of age and older who reported a place of work commuted to jobs that were either out of the county or out of the state of California. Using the 1980 Census data as a base, the Sierra Planning Organization (SPO) has estimated that as of 1989, approximately 5,535 Nevada County residents were employed outside the county. This figure represents 22.1 percent of workers reporting a place of employment. It should be noted, however, that the SPO estimates included 5,705 workers whose place of employment was "unknown". Many of these workers could be employed outside the county, which would make the true percentage of the work force which leaves the county for work higher than 21 or 22 percent. This supposition is confirmed by data from the 1990 Census which show that 24 percent of the Nevada County work force leaves the County or State for work.

Further consideration of the jobs/housing balance and criteria for establishing employment densities may be found in **Section 6: Land Use, Circulation, and Infrastructure Analysis** of this Volume.

Chapter 3 Housing Stock Characteristics

Housing Stock

Housing Unit Growth

During the past 30 years, the growth in the county's housing stock has generally been comparable with the rate of both population and household growth (See Table 3.1). During the 1970 to 1990 period, the rate of housing unit growth lagged slightly behind household formation. Given the county's rapid rate of population growth during this same period, this lag was not surprising, however, its continuation could foretell a housing shortage.

Table 3.1
HOUSING UNIT, HOUSEHOLD AND POPULATION GROWTH
1960 - 1990

Component	Percent Change		
	1960-1970	1970-1980	1980-1990
Housing Units	30.2	107.0	50.9
Households	29.2	108.4	53.7
Population	24.3	96.0	52.0

Source: U.S. Bureau of the Census, 1960, 1970, 1980, 1990.

Following the trends of both population and households, most of the housing unit growth occurred in the unincorporated area of the county. During the 1980 to 1990 period, the rate of growth in the unincorporated county was more than twice that of Grass Valley and Nevada City. Overall, the county's housing stock increased by almost 12,600 units during the 1980s.

Housing supply and demand can be related by comparing the rates of growth for housing units and households, respectively. A comparison of households by area (See Table 2.6) with housing units by area (See Table 3.2) revealed that during the 1980s, the rate of household formation county-wide exceeded the rate of housing unit growth. The disparity between supply and demand was most notable in the case of Grass Valley and the unincorporated area. Although the total number of housing units in these areas in 1990 exceeded the total number of households, the comparison does suggest that demand for housing in these areas is growing at a pace which exceeds supply. The opposite situation was in evidence in the eastern county, particularly within the Town of Truckee. There, the percentage change in housing units was more

than 88 percent, compared to household growth of about 66 percent. Moreover, there were more than two housing units for every one household in the eastern county.

Table 3.2
HOUSING UNITS BY AREA
1980 - 1990

Area	1980	1990	Percent Change
Incorporated Area	4,538	5,784	27.46
Nevada City	1,150	1,399	21.65
Grass Valley	3,388	4,385	29.43
Unincorporated Area	20,221	31,568	56.11
Western County	16,056	23,718	47.72
Eastern County	4,165	7,850	88.48
Nevada County	24,759	37,352	50.86

Source: U.S. Bureau of the Census, 1970, 1980, 1990.

At the census tract level, the largest percentage gains were in tracts 11 (415 percent), 4 (85 percent), 12 (82 percent) and 1 (69 percent). Although large on a percentage basis, the increase in housing units in tract 11 only added 357 units to the county's housing inventory. On the other hand, census tracts 4, 12 and 1 contributed 8,333 units or roughly two-thirds of the 12,593 units constructed during the 1980s. The areas with more slowly growing housing supplies included tracts 6 (14 percent) and 5 (17 percent). These tracts include the city of Grass Valley and its surrounding area. Census tract 10, a mountainous area that includes the Washington community, was the only census tract to record a decline in its housing stock. The area posted a net loss of 44 homes, down 26.5 percent from the 1980 total of 166 units.

The geographic distribution of new housing units corresponded to the population and household trends evidenced in the preceding sections. Collectively, tracts 1 and 4 accounted for approximately 40 percent of the total growth in the county's housing stock. Both tracts 1 and 4 are located in the rapidly growing, unincorporated portion of the western county, an area which includes the Lake of Pines and Lake Wildwood developments. Tract 12, which added more than 3,300 units to its inventory and accounted for more than one fourth of new units, includes Truckee and its surrounding area.

Housing Tenure

According to the 1990 Census, 55.6 percent of California's households were homeowners. This proportion has changed little over the past 40 years and has been significantly below the national average since 1950. This situation reflects California's position as the nation's most urban state, since urban areas tend to have more multi-family units and lower ownership rates than rural areas.

In comparison to the state, Nevada County is an area of relatively high home ownership rates (See Table 3.4). Overall, the county's rate of home ownership was 74.4 percent, supported primarily by the very high rate (80.7 percent) of home ownership in the unincorporated county. The rate of home ownership in eastern county, while substantially above the state rate, was approximately 18 percentage points lower than the western county.

The lowest rate of home ownership was in the city of Grass Valley, where about 41 percent of households were homeowners. This situation was understandable given that almost 40 percent of the county's multi-family units were located in Grass Valley. In comparison to the state, there are relatively few rental units in the county. On a percentage basis, rentals comprised about one-fourth of the total occupied housing units; state-wide the proportion exceeded 44 percent.

Table 3.3
HOUSING UNITS BY 1980 CENSUS TRACT
1980 - 1990

Census Tract	1980 Housing Units	1990 Housing Units	Percent Change
1	4,290	7,266	69.37
2	458	698	52.40
3	445	785	76.40
4	2,377	4,406	85.36
5	3,869	4,540	17.34
6	2,022	2,310	14.24
7	2,945	4,053	37.62
8	3,048	4,151	36.19
9	974	1,171	20.23
10	166	122	-26.51
11	86	443	415.12
12	4,079	7,407	81.59
Total	24,759	37,352	50.86

Source: U.S. Bureau of the Census, 1980, 1990.

Table 3.4
TENURE OF OCCUPIED HOUSING UNITS BY AREA
1990

Area	Owner Occupied		Renter Occupied	
	Number	Percent	Number	Percent
Incorporated Area	2,459	45.2	2,978	54.8
Nevada City	751	58.3	538	41.7
Grass Valley	1,708	41.2	2,440	58.8
Unincorporated Area	20,427	80.7	4,894	19.3
Western	18,167	83.1	3,690	16.9
Eastern	2,260	65.2	1,204	34.8
Nevada County	22,886	74.4	7,872	25.6
California	5,773.9	55.6	4,607.2	44.4

Source: U.S. Bureau of the Census, 1990.

Units in Structure

Table 3.5 illustrates the changing composition of the county's year-round housing stock over time. As expected, one unit or single-family structures were by far the predominate housing type in the county. Although this was the case, the share

of single family to all year-round units has declined during the past thirty years from approximately 90 to 80 percent. Even so, the emphasis on single family dwellings was still quite high, particularly in comparison to the state's share of single-family homes.

Table 3.5
PERCENTAGE OF YEAR-ROUND HOUSING UNITS BY TYPE
1960 - 1990

	Nevada County				California
Type	1960	1970	1980	1990	1990
Single Family	90.4	82.4	76.3	79.9	62.0
Multi-Family	7.6	10.7	13.0	8.7	31.9
Mobile Home	2.0	6.9	10.7	11.4	6.1
Total Units	9,184	11,635	23,815	33,857[1]	11,182,882

Note: [1] In 1990, the number of units in structure was reported in terms of total, rather than year-round, housing units. Accordingly, all vacant seasonal units were assumed to be one-unit structures and subtracted from total units to obtain year round units. This number may therefore be changed based on updated Census information.

Source: U.S. Bureau of the Census, 1960, 1970, 1980, 1990.

The share of year-round units represented by multi-family (i.e., two or more units in structure) climbed steadily from 1960 to 1980. In absolute terms, the number of multi-family units roughly doubled every ten years during this period. In the 1980s, however, growth in multi-family units was flat, if not slightly declining. Accordingly, the share of the housing stock represented by multi-family units dropped significantly from 13 to about 9 percent. The disparity between the proportion of multi-family units at the county and state levels was significant. The lack of multi-family development reflects a strong market bias toward construction of single-family residences, limited supporting public services in the county and the shortage of suitable sites in the county's mountainous terrain for developing multi-unit structures. On the other hand, the construction of additional multi-family dwellings could provide the county a source of more-affordable housing.

The share of total units accounted for by mobile homes sharply increased until the 1980s, when tighter restrictions on this housing type were implemented by the county. Despite this slowdown, the absolute number of mobile homes in the county rose from 2,540 to 3,845 from 1980 to 1990, an increase of 51.4 percent. In comparison to the state, the county had a significantly large share of its housing stock consisting of trailers and mobile homes. Although this type of housing is frequently found in rural areas, the high incidence of mobile homes in the county suggests that these units provide one source of affordable housing for county residents.

The geographic distribution of housing units by type followed a predictable pattern. Higher-density development was almost exclusively within the county's two incorporated areas. Mobilehomes, on the other hand, were almost exclusively a feature of the western unincorporated county, particularly the Penn Valley area encompassed by census tract 4.02 (See Figure 2.2). As demonstrated above, most of the county's new dwelling units have been developed in the unincorporated portion of the county. Given past trends, it is highly likely that the large majority of these units were single-family residences.

Table 3.6
PERCENTAGE OF HOUSING UNITS BY TYPE BY AREA
1990

Area	Single Family	Multi-Family	Mobile-homes
Incorporated Area	58.6	34.6	6.8
Nevada City	74.2	19.2	6.6
Grass Valley	53.6	39.6	6.8
Unincorporated Area	86.1	3.0	10.9
Western County	86.6	1.2	12.2
Eastern County	84.7	8.4	6.9
Nevada County	81.8	7.9	10.3

Source: U.S. Bureau of the Census, 1990.

Units by Use

The universe of all housing units can be divided into two sets, year-round units (i.e., all occupied units plus vacant units intended for year-round use) and seasonal units (i.e., vacant units intended for seasonal use). Recently, there has been substantial growth in the number of seasonal units, a trend which could be expected to continue as the population of nearby urban areas grows older. In 1980, seasonal units comprised slightly less than four percent of the county's total housing stock. By 1990, the number of seasonal units had almost quadrupled, increasing the percentage of seasonal units to almost 10 percent. Furthermore, seasonal units accounted for more than 20 percent of the new home construction that occurred during the 1980s.

Table 3.7
HOUSING UNITS BY USE BY AREA
1980 - 1990

Area	Year Round Use		Seasonal Use		Total Units	
	1980	1990	1980	1990	1980	1990
Incorporated Area	4,514	5,736	24	48	4,538	5,784
Grass Valley	3,370	4,365	18	20	3,388	4,385
Nevada City	1,144	1,371	6	28	1,150	1,399
Unincorporated Area	19,301	28,121	920	3,447	20,221	31,568
Western County	15,657	22,933	399	785	16,056	23,718
Eastern County	3,644	5,188	521	2,662	4,165	7,850
Nevada County	23,815	33,857	944	3,495	24,759	37,352

Source: Nevada County 1980 Census Handbook; U.S. Bureau of the Census, 1990.

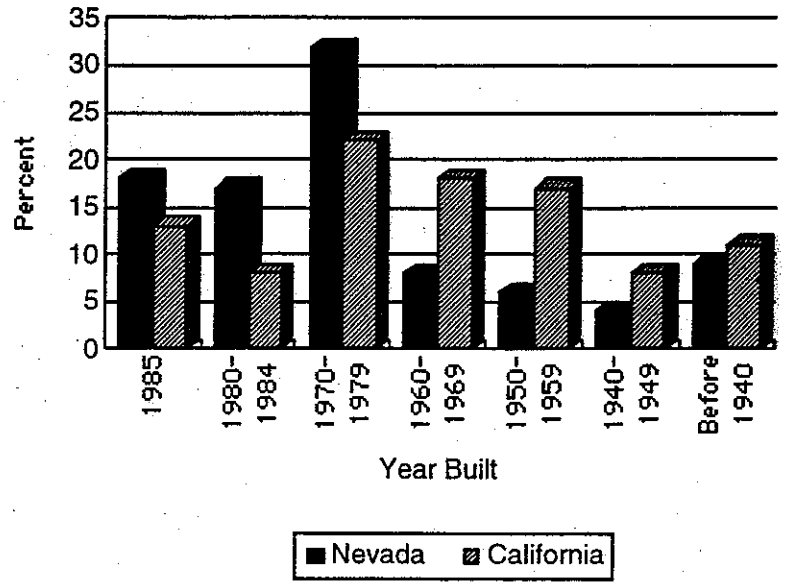
As Table 3.7 shows, virtually all of the new seasonal units were constructed in the unincorporated area of the county. Slightly more than half of the county's seasonal units were located in census tract 12.02, the area west of Truckee which includes the Tahoe Donner subdivision. Two-thirds of all seasonal units can be accounted for in tracts 12.01 and 12.02 combined. The remaining third were scattered throughout the county, primarily in tracts 7.01, 8 and 11.

Housing Quality

Housing Age

The age of an area's housing stock can be an indication of housing quality. Although proper maintenance can keep older housing in excellent condition, the older the housing, the more likely it is to be in substandard condition. In addition, the large majority of substandard housing in California is more than 30 years old.

Figure 3.1
AGE OF HOUSING
1990



Source: U.S. Bureau of the Census, 1990.

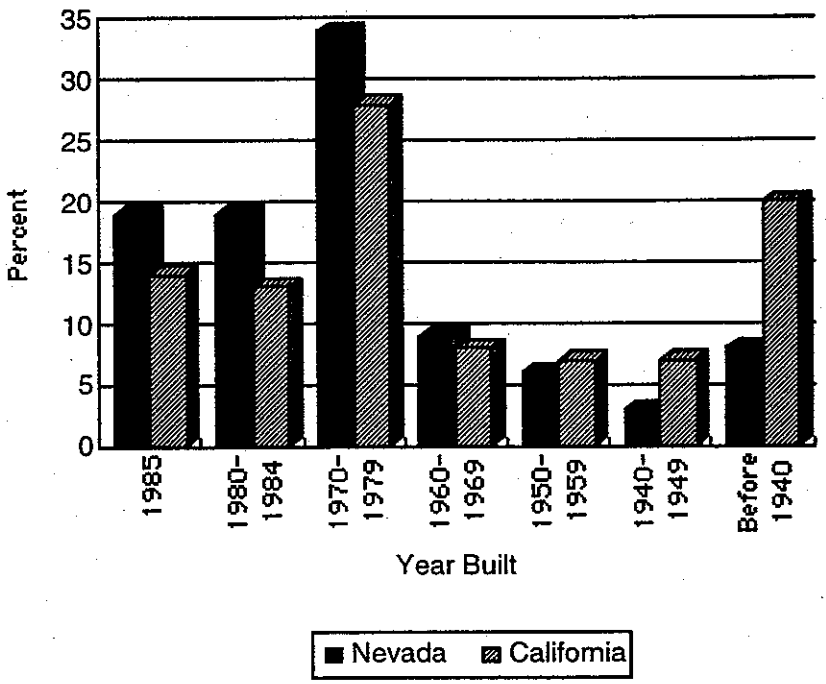
Figure 3.1 compares the age of the county's housing stock in 1990 to the age of California's housing. The data indicate that in comparison to the state, the county's housing stock was relatively new. This difference can be accounted for as a result of the new home construction accompanying each area's periods of very high population growth. For example, Nevada County's rate of population increase in the 1980s was much greater than the state's. This decade was also one of substantial new home construction in the county. As a result, almost 40 percent of the county's homes in 1990 were less than 10 years old. Given the county's substantial growth during the 1980s, one would expect that the county's housing stock had maintained its youthful profile during the last decade.

In contrast, California's high rate of new home construction coincided with the very high population growth period between 1940 and 1960. Accordingly, more than one quarter of the state's housing stock in 1990 was constructed between 1940 and 1959. In contrast, the percentage of the county's housing in this age group was about 11 percent, or roughly half the state-wide proportion.

Although slightly higher, the county had approximately the same percentage as the state of housing units which were more than 40 years old (15.1 versus 19.8, respectively). Given the growth described previously, it is likely that these older units currently represent less than 15.1 percent of the county's total housing stock.

Figure 3.2 illustrates the substantial differences in the age patterns of housing occupied by owners and renters. In comparison to homeowners, renters were more likely to live in older units. Specifically, more than one-fifth of the rental stock was constructed prior to 1940. This situation reflects the fact that many older single-family units are converted for use as rental units.

Figure 3.2
AGE OF HOUSING BY TENURE
1990



Source: U.S. Bureau of the Census, 1990.

In contrast the age distribution of the county's rental housing, almost 20 percent of owner-occupied units in 1990 was constructed within the past five years, and almost 40 percent was built within the past decade. Less than 30 percent of the county's rental housing was constructed during the same 10 year period.

During the 1980s, the growth in single family homes soared, while the growth of multi-family units was flat if not declining. (See Table 3.5). This situation

suggests that the county's stock of owner-occupied units currently is comprised of relatively new units. On the other hand, the county's rental stock is generally made up of older units.

Plumbing Facilities

The absence of complete plumbing facilities for a household's exclusive use has been used in the past as a general indicator of housing quality. Included in this tabulation are homes which lack some or all plumbing, as well as ones where complete facilities are shared by two or more households.

In 1970, four percent of the county's year-round housing units lacked some or all plumbing facilities. This percentage declined to slightly less than three percent by 1980 (See Table 3.8). Despite this decline, the number of units in the county without complete plumbing in 1980 still exceeded the percentage for the state of about 1.4 percent.

Table 3.8
PERCENTAGE OF YEAR-ROUND HOUSING UNITS LACKING COMPLETE PLUMBING FOR EXCLUSIVE USE
1980

Area	Owner-Occupied	Renter-Occupied	Total
Nevada County	2.08	3.99	2.97
California	0.37	2.24	1.36

Source: U.S. Bureau of the Census, 1980.

Within the county, the renter-occupied units had the highest percentage of units without complete plumbing. At almost four percent, the county rate significantly exceeded the state-wide proportion. Slightly more than half of the county's rental units had complete plumbing, but shared the use of these facilities with another household. Another 56 units (28 percent) lacked all plumbing facilities.

In comparison to rental units, a significantly lower percentage of the county's owner-occupied homes lacked complete plumbing. Nevertheless, the percentage was still much greater than for all of California, where the rate was about 0.4 percent. Approximately two-thirds of the owner-occupied units had complete facilities that were shared with another household. The remaining one-third of owner-occupied units lacked all plumbing facilities.

By 1990, the U.S. Census showed Nevada County still led California by larger percentage of housing units lacking complete plumbing facilities (0.8 percent versus 0.6 percent, respectively).

Vacancy Rates

Of the 37,352 housing units counted during the 1990 census, almost 6,600 or 17.7 percent were determined to be vacant (see Table 3.9). This vacancy rate was more than twice that recorded for the state. This situation may seem unusual until one remembers the rapid growth in the number of seasonal housing units in the county. Seasonal units, by definition, are unoccupied during part of the year and in the case of

Nevada County, would have been vacant on April 1st, the date of the census enumeration.

Table 3.9
HOUSING UNIT OCCUPANCY STATUS
1990

Occupancy Status	Nevada County		California	
	Number	Percent	Number	Percent
Occupied	30,578	82.3	10,381,206	92.8
Vacant	6,594	17.7	801,676	7.2
Total Housing Units	37,352	100.0	11,182,882	100.0

Source: U.S. Bureau of the Census, 1990.

The impact of seasonal units on the overall vacancy rate in the county is depicted in Table 3.10. As shown, more than half of the 6,594 vacant units were recorded as seasonal vacancies. Thus, the "true" vacancy rate was probably closer to nine rather than 18 percent. Overall vacancy rates for the incorporated and unincorporated areas were 5.3 and 24.7 percent respectively. This wide range of difference was principally due to the absence of seasonal units in Nevada City and Grass Valley and the concentration of seasonal units in the eastern county. For example, seasonal units accounted for 13.8 percent of vacant units in the incorporated area, but totaled more than 55 percent of the unincorporated area's vacancies. The impact of seasonal units on overall vacancy rates was particularly noteworthy in the eastern county where the number of vacant units actually exceeded the number of occupied units - a vacancy rate of 125 percent.

Table 3.10
HOUSING UNIT OCCUPANCY STATUS BY AREA
1990

Area	Occupancy Status				
	Occupied	Vacant			
		Total	Percent[1]	Seasonal	Percent[2]
Incorporated Area	5,437	347	6.00	48	13.83
Nevada City	1,289	110	7.86	28	25.45
Grass Valley	4,148	237	5.40	20	8.44
Unincorporated Area	25,321	6,247	19.79	3,447	55.18
Western	21,857	1,861	7.85	785	42.18
Eastern	3,464	4,386	55.87	2,662	60.69
Nevada County	30,758	6,594	17.65	3,495	53.00
California	10,381.2	801.7	7.17	195.4	24.37

Notes: [1] Percent of total units.
[2] Percent of total vacant units.

Source: U.S. Bureau of the Census, 1990.

The status of the county's vacant units generally was not the same as the status of the vacant units at the state level (See Table 3.11 and Figure 3.1). For example, the proportion of vacant for rent and vacant for sale units state-wide was 51.2 percent,

indicating that more than half of the vacant units were available for occupancy by home seekers. In contrast, only 12.9 percent of the county's units were vacant for rent or sale. Stated another way, only about 850 of the almost 6,600 vacant units (13 percent) in the county were available to be either rented or sold. This relatively low number of available vacant units could result in limited choices for consumers, as well as higher rents and home prices.

As noted above, seasonal units accounted for more than half of the county's vacant units. This proportion was more than twice the rate for California. The incidence of other vacant units in the county was also quite high (29.1 percent) and more than twice the state rate. The reason for his situation was not clear, nor was the use of these roughly 1,900 other vacant units. According to the census definition, other vacant units include units whose owners have voluntarily taken them off the market or which are not available for rental or for sale for some unspecified reason. It seems likely that many of these "other" vacant units were seasonally vacant units which were not correctly identified during the census enumeration.

Table 3.11
HOUSING UNIT VACANCY STATUS
1990

	Nevada County		California	
Vacancy Status	**Number**	**Percent**	**Number**	**Percent**
For Rent	431	6.5	291,010	36.3
For Sale	425	6.4	119,705	14.9
Rented or Sold, Not Occupied	324	4.9	69,455	8.7
For Seasonal Use	3,495	53.0	195,385	24.4
For Migrant Workers	3	0.1	3,051	0.4
Other Vacant	1,916	29.1	123,070	15.3
Total Vacant Units	6,594	100.0	801,676	100.0

Source: U.S. Bureau of the Census, 1990.

Economic Characteristics

Value of Owner-Occupied Units

In comparison to the state, the distribution of values for owner-occupied housing in Nevada County was skewed to the left of center, indicating that owner-occupied units in the county generally were of lower value than those state-wide (See Table 3.12). Unusually, at the lowest end of the range (i.e., median values less than $100,000), the county and the state had virtually equal shares of slightly more than 16 percent of owner-occupied units. On the other hand in the $100,00 to $149,000 bracket, the skewing was very evident. There the county's share was more than 30 percent, while state-wide the proportion was about 17 percent. As the median values rose, the county's proportionate share steadily declined, while the state share steadily rose. At the highest-value level (i.e., median values of more than $300,000), the state share was almost three times that of the county. The county-wide median value (i.e., the value above and below which lie 50 percent of all owner-occupied units values) in 1990 was $154,700, significantly below the state-wide median value of $195,500.

Figure 3.3
HOUSING UNIT VACANCY STATUS, NEVADA COUNTY AND CALIFORNIA
1990

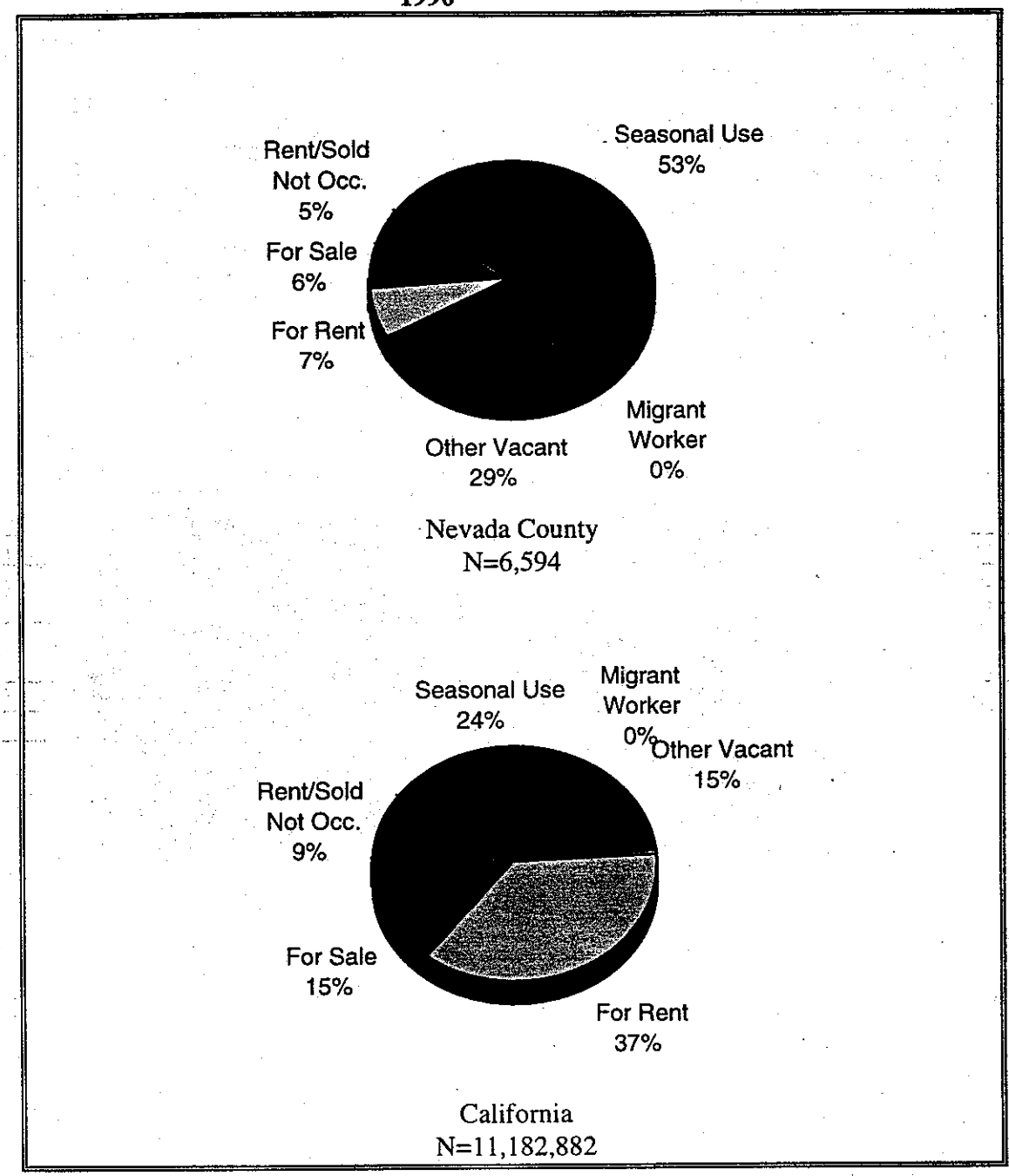


Table 3.12
VALUE OF SPECIFIED OWNER-OCCUPIED UNITS
1990

Value	Nevada County		California (Percent)
	Number	Percent	
Less than $50,000	268	1.57	2.54
$50,000 to $99,000	2,553	14.92	13.57
$100,000 to $149,000	5,249	30.69	17.31
$150,000 to $199,999	4,342	25.38	18.16
$200,000 to $299,999	3,235	18.91	24.54
$300,000 or more	1,459	8.53	23.88
Specified Owner-Occupied Units	17,106	100.00	100.00
Median Value (Dollars)	$154,700		$195,500

Source: U.S. Bureau of the Census, 1990.

Figure 3.4
VALUE OF OWNER-OCCUPIED UNITS BY AREA
1990

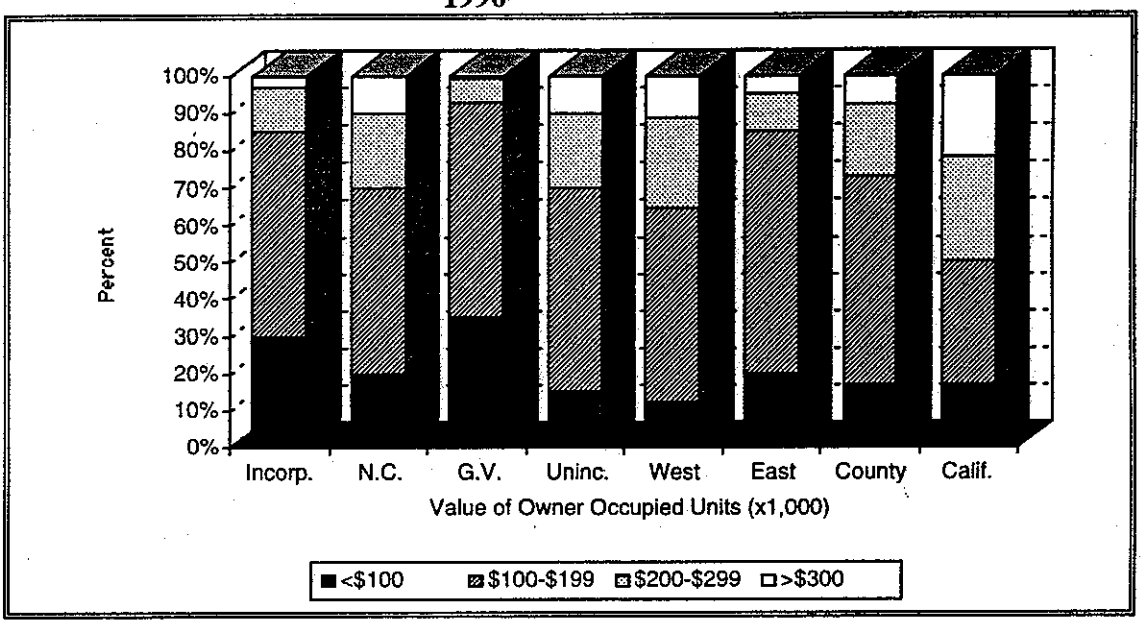
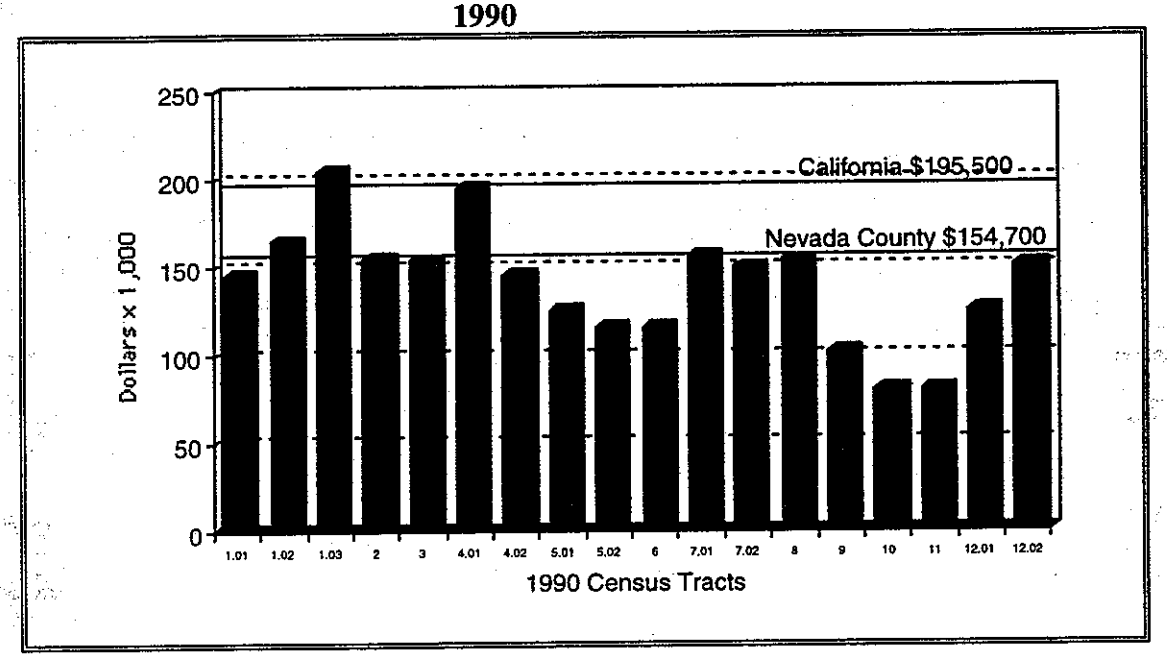


Figure 3.4 illustrates the distribution of values of owner-occupied units by area. The areas with a relatively high share of lower-value units included Grass Valley and the eastern county, where more than 20 percent of the owner-occupied units were valued at less than $100,000. The eastern county also had two-thirds of its owner-occupied units consisting of homes valued between $100,000 and $199,000. The share of units in the $200,000 to $300,000 bracket was 20 percent in the unincorporated county, roughly double the proportion for the incorporated area. Within the incorporated area, it was interesting to note that almost 20 percent of the Nevada City homes were valued this highly in comparison to about 5 percent for Grass Valley. This same pattern was exhibited for the highest-value bracket (i.e., those homes valued at more than $300,000).

The distribution of median values for owner-occupied units by census tract is illustrated in Figure 3.5. The black horizontal lines indicate the median values for both Nevada County and California. In general, the tracts with the highest median values (i.e., tracts 1.03 and 4.01) were also the tracts with the greatest gains in housing units during the 1980 to 1990 period (See Table 3.3). These tracts were also the only two in the county that produced median values comparable to California's. Tracts 10 and 11, which collectively produced only 313 new units during the 1980s, recorded the lowest median values for owner-occupied units.

Figure 3.5
MEDIAN VALUE OF OWNER-OCCUPIED UNITS BY CENSUS TRACT
1990



Contract Rent of Renter-Occupied Units

As was the case with the values of owner-occupied units, the rents paid by county residents generally were lower than rents paid state-wide (See Table 3.13). For example, almost 52 percent of the county's renter-occupied units had contract rents of less than $499 per month. At the state level, only 39 percent of rental units had monthly rates that low. The proportion of units with rents between $500 and $749 were more in line at about 35 and 38 percent for the county and state, respectively. The disparity in rents paid was most evident at the highest level (i.e., more than $1,000 per month). Nevada County had fewer than two percent of its rental units in this rent range, while state-wide, the proportion was more than seven percent. Overall, the median contract rent paid in Nevada County was $72 dollars per month less than the median value recorded for California.

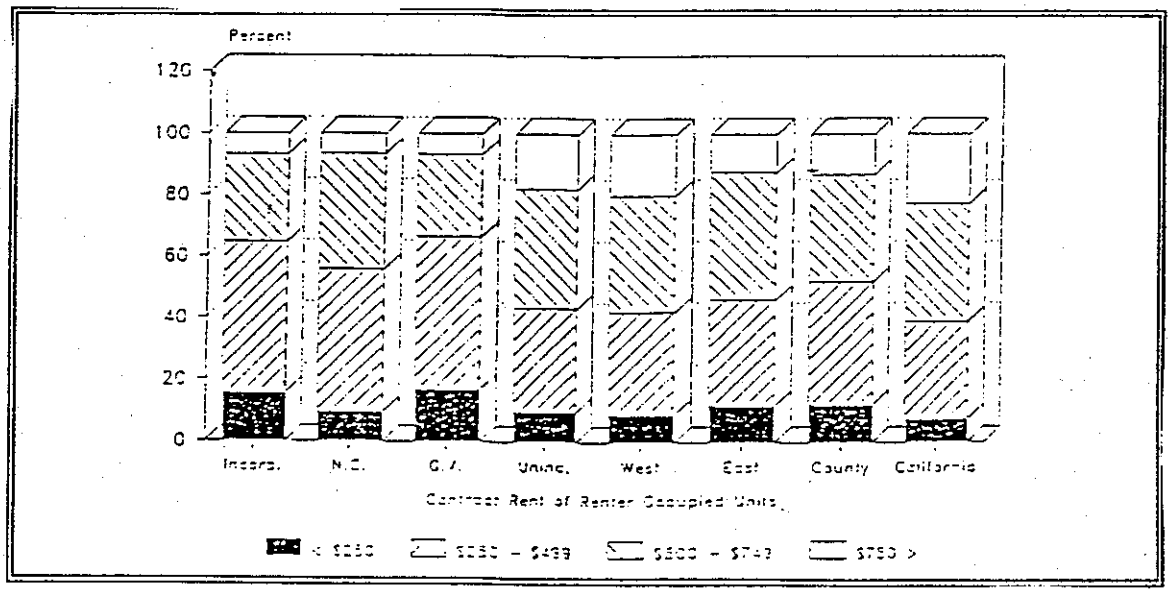
Table 3.13
CONTRACT RENT OF SPECIFIED RENTER-OCCUPIED UNITS
1990

Contract Rent	Nevada County		California
	Number	Percent	(Percent)
Less than $250	852	12.17	7.51
$250 to $499	2,786	39.81	31.48
$500 to $749	2,427	34.68	38.46
$750 to $999	811	11.59	15.19
$1,000 or more	122	1.74	7.36
Specified Renter-Occupied Units	6,998	100.00	100.00
Median Rent (Dollars)	$489		$561

Source: U.S. Bureau of the Census, 1990.

The incorporated area of the county, and the city of Grass Valley in particular, was identified previously as the location for most of the county's multi-family dwellings (See Table 3.5). Given this situation, it was not surprising to find that these areas were also where a substantial number of lower-rent units were located (See Figure 3.6). The percentage of rental units with monthly rents of less than $250 was almost 17 percent in Grass Valley, in comparison to a county-wide proportion of about twelve percent. Almost two-thirds of Grass Valley's rental units had rents of less than $500 per month, while the county's share of comparably priced rental units was only 52 percent.

Figure 3.6
CONTRACT RENTS OF RENTER-OCCUPIED UNITS BY AREA
1990



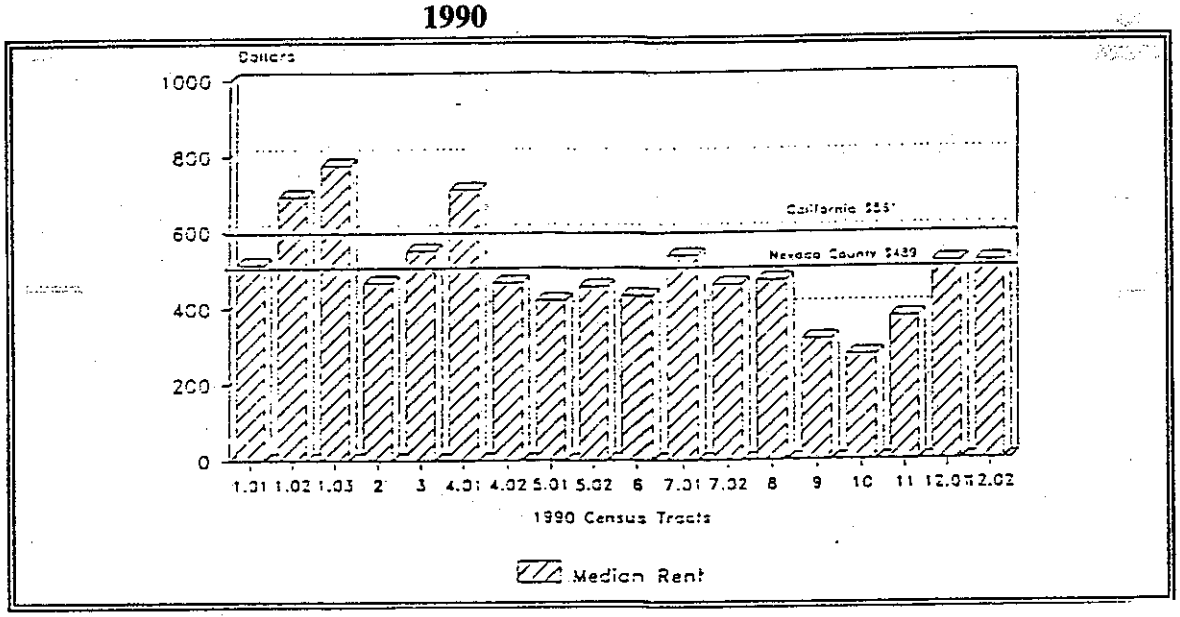
Areas with relatively higher rents included the unincorporated portion of the county, particularly the western county. For example, almost 20 percent of the rental units in the western county had rents exceeding $750 per month, whereas county-wide

only about 13 percent of units commanded these rental rates. The proportion of the incorporated area's rental units in this category was about seven percent.

There was a strong correlation between those census tracts with high median values for owner-occupied units and those with high median rents (See Figures 3.5 and 3.7). For example, tracts 1.03 and 4.01 had median values for owner-occupied units which were close to or above $200,000. These same tracts had the county's highest median rents, $777 and $711 per month, respectively. Remember too that these were the areas which produced the greatest gains in housing unit growth during the 1980 to 1990 period. This situation suggests that much of the new housing being constructed within the county is being priced at levels which are more comparable to state-wide, rather than county-wide, prices.

The relationship between the median value of owner-occupied units and median rents also was evident at the lower end of the scale of values. For example, tracts 10 and 11, which had median home values of about $85,000 dollars, had median rents of $275 and $375 dollars, respectively.

Figure 3.7
MEDIAN CONTRACT RENTS OF RENTER-OCCUPIED UNITS BY CENSUS TRACT
1990



Chapter 4 Housing Needs Assessment

Affordability

Percentage of Income Spent for Housing by Income

In Nevada County, as elsewhere, there was a high correlation between a household's income and the percentage of its income spent for housing (See Table 4.1). Lower income households generally paid high percentages of their incomes for housing while high income households tended to pay low percentages. In 1980, 70 percent of the county's households with incomes below $5,000 paid more than 25 percent of their incomes for housing; more than half paid over 35 percent. In contrast, only about 20 percent of all households with incomes over $20,000 paid as much as 25 percent of their income for housing.

In 1990, lower income households continued to pay high percentages of their incomes for housing while high income households tended to pay low percentages. This was especially true for renters. Table 4.1 shows the incidence of paying high percentages of income for housing was much higher for renters than for owners, particularly among the low income ranges. Over 85 percent of renter households with incomes less than $10,000 in 1990 paid 25 percent or more of their income for housing compared to only 67 percent of owners in the same income category. This situation suggests that regardless of tenure, purchasing shelter absorbed a disproportionate share of income for the county's poorest households.

Table 4.1
HOUSEHOLD INCOME
BY PERCENTAGE OF INCOME SPENT FOR HOUSING
AND BY TENURE
1990

Percentage of Income Spent	Total	Less Than $10,000	$10,000 $19,000	$20,000 $34,999	$35,000 $49,999	$50,000 or More
Total Households						
Less than 20%	38.9	6.0	21.9	38.3	40.2	62.6
20% to 24%	14.0	5.4	9.5	10.3	22.3	17.5
25% to 34%	19.3	11.4	18.0	23.0	25.4	15.0
35% or More	25.3	65.2	47.9	27.0	11.6	3.9
Not Computed	2.5	12.0	2.7	1.5	0.5	1.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Owner Households						
Less than 20%	47.1	11.8	35.7	48.4	43.1	61.1
20% to 24%	13.9	8.5	11.1	7.8	18.0	18.0
25% to 34%	18.1	11.8	18.0	16.4	24.9	16.2
35% or More	19.9	54.9	35.2	27.4	13.8	4.5
Not Computed	1.1	13.0	00.0	00.0	0.3	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Renter Households						
Less than 20%	20.2	1.0	6.2	17.8	30.4	72.2
20% to 24%	14.2	2.7	7.7	15.4	37.1	14.7
25% to 34%	22.0	11.2	18.1	36.4	27.0	7.3
35% or More	37.9	74.1	62.2	26.1	4.2	00.0
Not Computed	5.7	11.0	5.8	4.5	1.2	5.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: U.S. Bureau of the Census, 1990.

Overpaying

One indicator of problems with housing affordability is the extent of overpaying, meaning that a household pays a higher percentage of its income for housing than will leave sufficient money available for the purchase of other essential goods and services. The term overpaying generally is used only to refer to lower income households which pay more than 25 percent of their gross incomes for housing costs (i.e., 25 percent is the percentage contained in state law defining affordable housing costs for lower income households).

Although this definition of overpaying is commonly used, higher-income households can, and frequently do, pay more than 25 percent of their income for housing. Since these households typically can afford to pay a higher percentage of income for housing, this situation has not been interpreted to constitute an overpayment problem. In California, the majority of the households above the lower income level that pay more than 25 percent of income for housing are homeowners. While many of these homeowners may be paying more than they can afford for housing, it has not been determined whether this results from market constraints or consumer preference.

In 1980, 6,319 of the county's households paid more than 25 percent of their income for housing. Of these, 3,763 (59.6 percent) were owners and 2,556 (40.4 percent) were renters. Of the total households paying more than 25 percent of income for housing, 3,432 were lower income households. These overpaying households comprised about 22 percent of all the households in the county in 1980. Table 4.2 provides information on those low income households making overpayments as of 1990. The data suggests that the problem of overpayments has grown since 1980. Both the total number and percentage of low-income owners and renters making overpayments has increased over time; by 1990, about 24 percent of all households in the county were overpaying. This percentage exceeds recent estimates of the percentage of overpaying households in California (i.e., 22 percent of all California households in 1989). While ideally all households would pay equally proportionate shares of their incomes for housing, comparison to state-wide data suggests that overpayment may become a significant problem for county households.

Table 4.2
OVERPAYING
BY HOUSEHOLD INCOME AND TENURE
1990

	Very Low Income		Other Low Income		Total Low Income	
Household	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Renters Overpaying	2,779	89.7	1,068	65.7	3,797	81.4
Total Renters	3,041		1,626		4,667	
Owners Overpaying	1,966	61.1	1,499	43.9	3,465	52.2
Total Owners	3,220		3,415		6,635	

Source: U.S. Bureau of the Census, 1990.

Overpaying is primarily a problem for renter households. However, the proportion of all overpaying households has risen during the past decade. In 1980, more than 38 percent of the county's renter households were lower income households with an overpaying problem. By 1990, a total of 3,797 low income renters, or 81 percent of all low income renters, made overpayments. This is an increase from the 1980 percentage of 75 percent.

In contrast renters, only about 14 percent of the owner households in 1980 were overpaying and low income. As of 1990, a total of 3,465 low income owners, or 52 percent of all low income owners, made overpayments. This is an increase from the 1980 percentage of 49 percent. Despite the disparity in percentages, the absolute numbers of overpaying lower income owner and renter households were quite comparable; 3,465 and 3,797, respectively.

The pattern of overpaying by tenure in the county was similar to the pattern evident in California since 1970. In both 1970 and 1980, 37 percent of all renters were lower income households that overpaid. In 1980, nine percent of the state's owner households were lower income with an overpaying problem.

Overcrowding

One means for households to reduce the effect of housing and utility costs is by adding members to the household, thereby resulting in lower average costs per household member. This practice can result in extreme overcrowding and lower quality of life for household members.

The U.S. Bureau of the Census gauges overcrowding by tabulating the number of housing units occupied by more than one person per room, not including the kitchen and bathrooms. Using this indicator, 3.7 percent of the county's 30,758 occupied housing units were overcrowded. The highest proportion of overcrowded units occurred in the eastern county, where slightly more than five percent of units had more than one person per room. Generally, the rate of overcrowding was lower in the incorporated areas of the county. This situation may reflect a tendency on the part of larger households to locate on larger lots outside of established urban areas.

As Table 4.3 indicates, the incidence of overcrowding in Nevada County (3.7 percent) was significantly below the rate for California (12.3 percent). In absolute terms, the number of overcrowded units in the county grew from 881 in 1980 to 1,132 in 1990, an increase of 28.5 percent. As a share of occupied housing units, however, the proportion of overcrowded units actually fell from 4.4 percent in 1980 to 3.7 percent in 1990.

Table 4.3
OVERCROWDING STATUS BY AREA
1990

Area	Occupied Units	Overcrowded Units	Percent Overcrowded
Incorporated Area	5,437	160	2.9
Nevada City	1,289	29	2.2
Grass Valley	4,148	131	3.2
Unincorporated Area	25,321	972	3.8
Western	21,857	784	3.6
Eastern	3,464	188	5.4
Nevada County	30,758	1,132	3.7
California	10,381,206	1,275,377	12.3

Source: U.S. Bureau of the Census, 1990.

Overcrowding was more prevalent in the county's rental housing than in owner-occupied housing. Approximately seven percent of renter-occupied units had more than one person per room, almost double the county-wide rate for all units. In comparison, only about 2.5 percent of owner-occupied units were overcrowded.

Rehabilitation and Replacement

The condition of county's housing stock has important implications for the health and safety, since a substandard dwelling can pose minor or even life threatening hazards to its residents. In addition, the condition of a housing unit also has important economic considerations. Minor deficiencies, if left unattended, will likely lead to major problems which can become so bad, the only choice is the demolition of the unit.

According to the state Department of Housing and Community Development, there is no absolute point at which the cost of routine home repairs turns into rehabilitation; however, rehabilitation typically involves repair costs exceeding $2,000, if not substantially more (*California Statewide Housing Plan Update*, 1990). There is also no firm guideline for determining the point of diminishing return for rehabilitation. One rule of thumb suggests, however, that when the cost of repairs exceeds 50 percent of the unit's value, then rehabilitation is generally not feasible and the unit should be replaced.

The Nevada County Planning Department previously has estimated the number of dwelling units needing rehabilitation and replacement (See Table 4.4). For 1970, the Department estimated that approximately 2,000 dwelling units were in need of replacement or repair, split about equally between the two categories. Overall, these units comprised about 18 percent of the year-round housing inventory. By 1979, the estimated number of units had doubled to approximately 4,000 and again was split evenly between rehabilitation and replacement. The share of total units was about the same at 17 percent.

Using a different methodology, the Department of Housing and Community Development estimated state-wide rehabilitation and replacement needs by county for 1989. Although not strictly comparable to the Planning Department's data, these estimates provide a benchmark for estimating the current, county-wide rehabilitation and replacement need. The state concluded that there were slightly more than 4,500 units in need of rehabilitation or replacement in 1989. This number was about 13 percent of the county's housing stock, the same percentage as for California. Interestingly, Nevada County's share of units in need was the lowest of all non-metropolitan counties and therefore, was substantially below the proportion for these counties taken as whole (22 percent).

In September 1991, the Nevada County Housing and Community Services performed two limited windshield surveys of housing conditions in the county. The first survey covered 58 owner-occupied units in the unincorporated eastern county, specifically in an area which was known to have a high proportion of older and low-value units. The second survey included 22 older owner-occupied homes in the western unincorporated county adjacent to Grass Valley, another area known to contain older, owner-occupied homes. It is important to note that neither survey was based on a random sample, and therefore, the results should not be interpreted as applicable to the county's entire housing stock. The condition of the 80 homes surveyed is presented in Table 4.5.

Table 4.4
REHABILITATION AND REPLACEMENT NEED
1970 - 1989

Year	Rehabilitation	Replacement	Total	Percentage[3]
1970[1]	1,103	997	2,100	18
1979[1]	2,111	1,909	4,020	17
1989[2]			4,570	13

Notes: [1] Need estimated by Nevada County Planning Department based on proportion of structures built prior to 1939 and housing value. Includes renter-occupied structures.
[2] Need estimated by state Department of Housing and Community Development based on study of housing conditions conducted in 1985 and 1986.
[3] Percentage of year-round housing units.

Source: *Nevada County General Plan, Technical Data, Part III*, March 1980; *California Statewide Housing Plan Update*, State of California Department of Housing and Community Development, October 1990.

Table 4.5
OWNER-OCCUPIED HOUSING CONDITIONS SURVEY RESULTS
1991

Need for Rehabilitation	Western	Eastern	Total	Percentage
Sound	17	1	18	22.5
Minor	4	0	4	5.0
Moderate	25	13	38	45.5
Substantial	4	5	9	11.25
Dilapidated	8	3	11	13.75
Totals	58	22	80	100.0

Source: Nevada County Department of Housing and Community Services, 1992.

The Department found that 25 percent of the units surveyed were either in need of substantial repair or dilapidated. This high percentage was not unusual, given that the homes surveyed had been selected from areas known to contain large numbers of older, low value units. It was also no indication that this same percentage is applicable to the entire county. Based on the state estimate, the proportion of units needing rehabilitation or replacement was probably closer to 13, rather than 25, percent.

To help identify major needs for assistance and the distribution of those needs throughout the county, the 1992 Housing Conditions Survey was conducted during February 1992 by staff of the Rural California Housing Corporation, under direction of the Nevada County Department of Housing and Community Services. The data were obtained through "windshield surveys" in selected areas of the County that are representative of different settings, ages and mixes of housing development. While the most comprehensive survey conducted within the county, it does not represent an exhaustive analysis of housing conditions. Table 4.6 summarizes county-wide data.

1992 HOUSING CONDITIONS SURVEY

Summary of County-wide Data

CONDITION	AREA											CONDITION TOTAL	PERCENT OF UNIT TOTAL
	Mooney Flat	Penn Valley	Grass Valley	Alta Sierra	Greenhorn	Nevada City	Washington	Truckee	Sierra Mdws	Glenshire	Floriston		
Sound	31	442	834	1068	141	294	49	208	349	968	16	4400	71%
Minor	5	63	203	57	8	76	5	117	22	33	14	603	10%
Moderate	9	69	323	47	14	137	54	159	5	6	7	830	13%
Substantial	3	1	39	2	0	50	7	95	0	0	3	200	3%
Dilapidated	4	13	64	56	0	24	2	17	0	0	1	181	3%
SUB-TOTALS													
Standard	31	442	834	1068	141	294	49	208	349	968	16	4400	71%
Substandard	21	146	629	162	22	287	68	388	27	39	25	1814	29%
UNIT TOTAL	52	588	1463	1230	163	581	117	596	376	1007	41	6214	100%

June 1992

The 1992 survey of the eleven selected areas county-wide, 29 percent of the housing stock is in need of rehabilitation and 3 percent is dilapidated. The individual communities vary greatly in rehabilitation needs. For example, 43 percent of the housing stock in unincorporated Grass Valley is in need of repair while only 13 percent of the housing stock in Alta Sierra, a community just south of Grass Valley, is rated below standard. The proportion of housing in need of rehabilitation within the Town of Truckee is 65 percent, a much greater need of repair than any of the other eleven communities. In descending order after Truckee are Floriston, Washington, and unincorporated Nevada City, with respective proportions of housing stock in need of rehabilitation of 61, 58, and 49 percent.

Special Needs

First Time Buyers

A household's ability to purchase a home depends on its ability to make a down payment and pay initial fees, make the monthly mortgage payments, and pay the other costs associated with home ownership, such as maintenance and repairs. The ability of a household to afford these home ownership costs depends in turn on its current income and assets, as well as its anticipated income level.

In order for first time buyers to become homeowners, they must be able to afford the initial costs of a home purchase. Many first time buyers must also be able to afford the purchase of new home furnishings. In addition, first time buyers are purchasing in the current market at current interest rates and prices. Since home prices in California have significantly outpaced the growth in household incomes during the past 20 years, the ability of first time buyers to purchase a home in California has been seriously eroded.

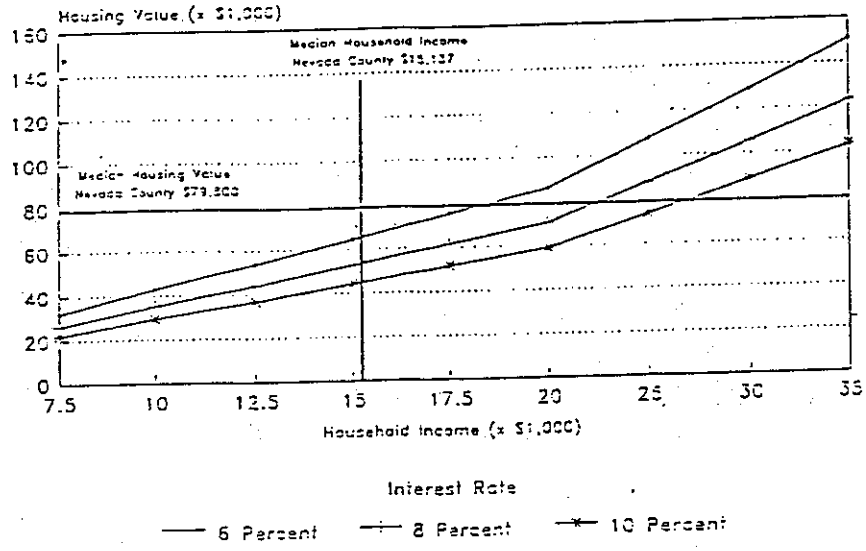
Figure 4.1 illustrates the relationship between income and housing price at various interest rates (Note: The 1980 census data was used since more-current income information was not be available from the U.S. Bureau of the Census at the time this report was prepared). It was assumed that each household spent 25 percent of its income on housing and that 80 percent of the home's value was financed over 30 years.

The difficulty facing the first-time home buyer in 1980 was readily apparent. To begin with, the household must be able to afford the down payment. Based on a county-wide median home value of $79,800 in 1980, the down payment would be 20 percent of the value or $15,960. Secondly, the household must be able to afford the monthly payments while not exceeding 25 percent of its total income. Depending upon the interest rate, the monthly payments on the balance due of $63,840 would range from about $387 (6 percent interest) to $564 (10 percent interest).

As Figure 4.1 clearly shows, all households earning less than the 1980 median income of $15,137 (i.e., 10,010 households or 50 percent of the 1980 total) would not be able to afford the median-priced home, given the current set of assumptions. In order for these households to afford the median-priced home, either interest rates must decline or the households must pay more than 25 percent of their incomes for housing or both. For first-time buyers, paying less than 20 percent down would also make the home more affordable. As the graph indicates, a household income in

excess of $17,500 would be required to purchase a $79,100 home at a six percent interest rate. In 1980, about 46 percent of all households earned more than $17,500. If the interest rate were 10 percent, then a household would need an annual income of more than $25,000 to afford the same home. In 1980, only about 27 percent of all households earned more than $25,000.

Figure 4.1
HOUSING VALUE BY HOUSEHOLD INCOME AT VARIOUS INTEREST RATES
1980



Source: U.S. Bureau of the Census, 1980.

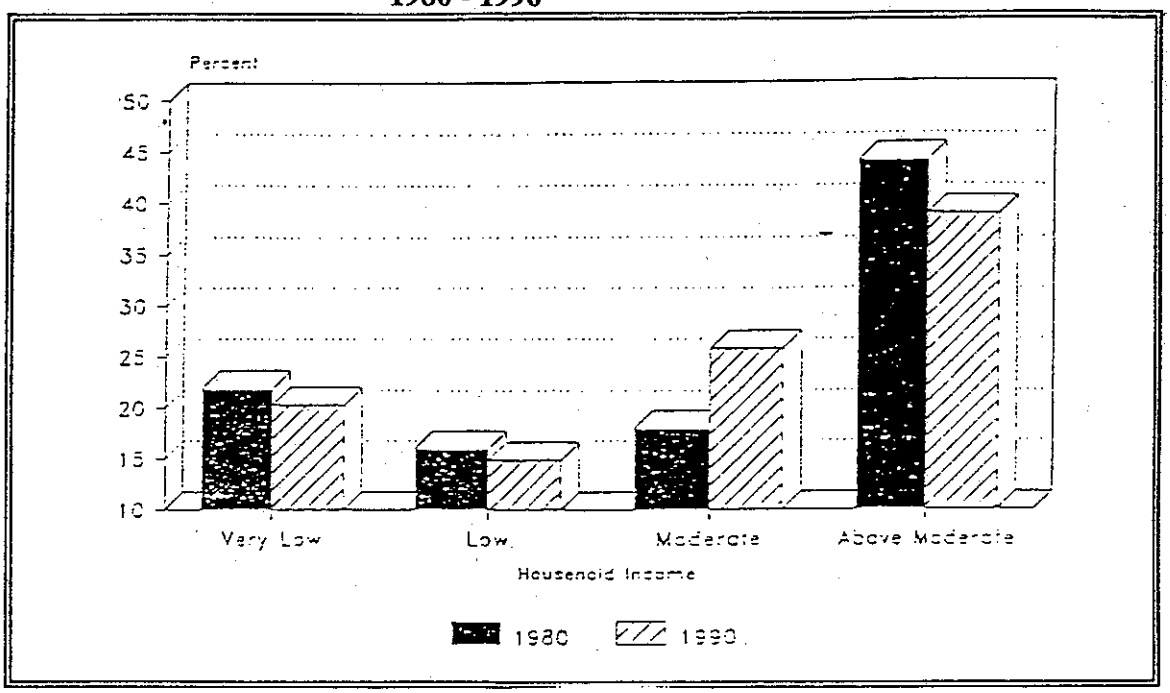
Data available from the California Department of Finance and Nevada County Board of Realtors indicate conditions in 1993 are similar to those in the previous decade. The current county-wide median price for a house is $148,000. After a 20 percent down payment of $29,600, monthly payments over 30 years on the remaining balance of $118,400 would range from $818 to $869 (for fixed interest rates of 7.375 percent and 8 percent, respectively). Given the median county income of $40,700, households must obtain loans at the lowest available interest rate in order to afford the purchase of a house. Since current mortgage costs reflect a period of economic slowing, the narrow gap of affordability provided by the lowest interest rates in 40 years may close again with increased market activity and quickening of the state's economic pace.

Low and Moderate Incomes

According to the state Department of Housing and Community Development, affordability is the most widespread housing problem in California. Although this problem has many aspects, for low and moderate income households it typically means having little money left over for other necessities after paying for housing. It may also mean that low income renters are never able to achieve home ownership.

The terms "very low", "low" and "moderate" incomes can be defined in relation to the median income for an area. Very low income households are those earning less than 50 percent of the median income. Low income households are those earning more than 50 and less than 80 percent of the median income. Moderate income households have incomes greater than 80 and less than 120 percent of the median income. Households with incomes of more than 120 percent of the median income are classified as above moderate-income households.

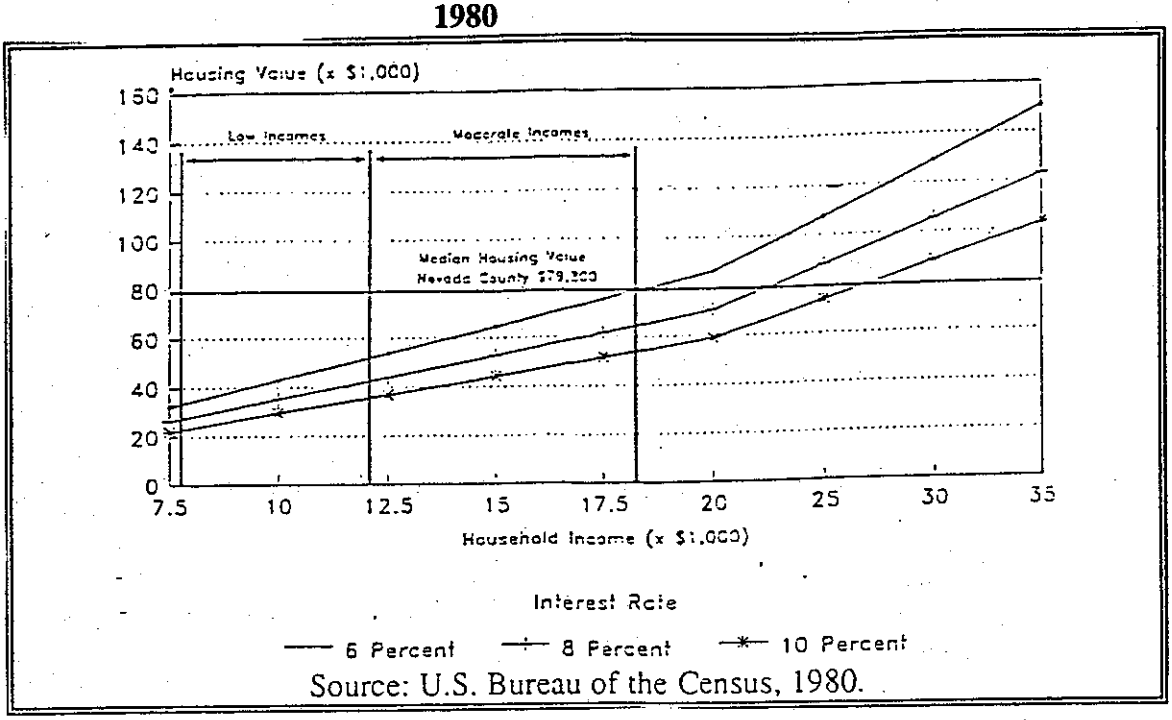
Figure 4.2
PERCENTAGE OF HOUSEHOLDS BY INCOME CATEGORY
1980 - 1990



In 1980, approximately 7,600 of the county's 21,019 households (38 percent) were low or very low income; meaning they earned less than 80 percent of the median income of $15,137. According to estimates prepared by the Sierra Planning Organization (SPO), the number of very low- and low-income households in 1990 was 11,264, an increase of about 48 percent (Note: Household income information from the 1990 Census will not be available until 1993). Despite this increase, these income categories declined slightly as a percentage of all households from 38 to approximately 35 percent. Figure 4.2 illustrates the distribution of household incomes in both 1980 and 1990.

According to the SPO estimates, the biggest change from 1980 to 1990 in the distribution of household incomes occurred in the moderate and above moderate income categories. In 1980, households with moderate incomes (i.e., 80 to 120 percent of the median), comprised about 18 percent of all households; by 1990, their share had increased to 28 percent. This increase resulted primarily from a significant decline in the percentage of households with above-moderate incomes. These households, who made up 44 percent of the total in 1980, were estimated to be only about 39 percent of all households in 1990.

Figure 4.3
HOUSING AFFORDABILITY FOR LOW AND MODERATE-INCOME HOUSEHOLDS
1980



Source: U.S. Bureau of the Census, 1980.

The affordability problem for Nevada County's low and moderate income households is illustrated in Figure 4.3. The graph indicates the income necessary to purchase a home of a specified value under the assumptions that the down payment is 20 percent and that the remaining balance is financed over 30 years. The other constraint is that the household cannot pay more than 25 percent of its income for housing.

It is clear that low- and moderate-income households would not be able to afford housing valued above the 1980 median home value of $79,800. In fact, for low-income households, the only affordable units would be ones valued between $20,000 and $50,000. In 1980, units valued at less than $50,000 made up only eight percent of the county's owner-occupied units; yet, low income households were 16 percent of all households. One reasonable explanation for this difference is that the county's low-income households typically paid more than 25 percent of their incomes for housing. Considering the previous discussion of current first-time buyer affordability, current interest rates may provide only limited (and probably short-lived) opportunities for households in these income groups.

Elderly

As demonstrated previously, the distribution of Nevada County's population by age was skewed significantly towards the higher age brackets (See Figure 2.3 and Table 2.3). Collectively, persons over the age of 65 make up more 18 percent of the county's total population, compared to about 10.5 percent statewide. A steady in-migration of retirees was the most likely explanation for the large number of elderly persons residing in the county.

In 1990, the census recorded 14,251 elderly persons (i.e., over the age of 65) living in the county (See Table 4.6). Close to 80 percent of the elderly lived in the western unincorporated area of the county. An additional 15 percent resided in the city of Grass Valley. More than 40 percent of the county's elderly lived in one of five census tracts: 1.01 (8.9 percent), 1.03 (9.3 percent), 4.01 (10.0 percent), 5.1 (10.2 percent) and 8 (13.3 percent). All of these tracts are located in the western county and were some of the fastest growing areas during the 1980s. They also encompass some of the county's larger residential developments and have access to the county's major highways.

Tenure data recorded by the 1990 Census showed 7,578 housing units were occupied by elderly owners, while 1,202 units were rented by elderly householders. As an age group, the elderly have the highest ratio of owner-occupied to rented households, based largely upon long-term (pre-Proposition 13) ownership and the in-migration of retirees from urbanized areas of the State. The housing needs of these groups are largely distinguished by the relative affluence of recent arrivals compared to long-term county residents.

For many seniors who occupy a residence that was purchased years ago to house a growing family, the long-term home investment may preclude both mobility and fiscal opportunity. The needs of these households may include proximity to transit, medical and commercial services, or the provision of low-cost, on demand transportation and in-home care services. For many urban retirees who are capable of moving to rural, mountainous communities such as those within Nevada County, the need for ancillary, publicly-supported services is reduced by excess purchasing power remaining after obtaining housing at local market costs that are substantially below those found in the large urban areas of the State. Other than these broad, qualitative distinctions, the fixed income levels of most seniors creates needs for both owner-occupied and rental housing units at below- or low-market costs, as indicated by the 23 persons waiting for Section 8 certificates or vouchers to rent one bedroom housing units (note: this was the total number of people waiting for Section 8 assistance on one bedroom units, since data available to the Nevada County Department of Housing and Community Services in 1992 did not distinguish seniors from other applicants).

Table 4.7
POPULATION AGE 65 AND OLDER BY AREA
1990

Area	1990	Percent
Incorporated Area	2,665	18.7
Nevada City	545	3.8
Grass Valley	2,120	14.9
Unincorporated Area	11,586	81.3
Western County	11,082	77.8
Eastern County	504	3.5
Nevada County	14,251	100.0

Source: U.S. Bureau of the Census, 1990.

Disabled

In 1978, the California Department of Rehabilitation conducted a state-wide telephone survey of disabled persons. Based on this survey, the Department estimated that there were 3,900 disabled persons in Nevada County between the ages of 16 and

64. This number represented approximately 10 to 12 percent of the county's estimated 1978 population between the ages of 16 and 64. Table 4.7 summarizes the number of disabled persons by their primary disability.

Table 4.8
DISABLED POPULATION BY TYPE OF DISABILITY
1978

Disability	Number
Blind	40
Deaf	20
Other Sensory	90
Cardiovascular	610
Respiratory	240
Digestive	100
Mental Retardation	190
Alcoholism/Drugs	200
Emotional	210
Muscular/Skeletal	1,670
Neurological	240
Other Conditions	290
Total	3,900

Source: California Department of Rehabilitation, 1978.

According to Mr. Sam Dardick of the FREED Independent Living Center in Grass Valley, there currently are 11,000 disabled persons in Nevada County, of whom 7,000 are severely disabled. Based on these estimates, the proportion of disabled persons in the county would be about 14 percent of the current population.

Although no current estimates are available for the number of disabled persons requiring special accommodations, an average of ten disabled persons per month request housing assistance through FREED. In addition, FREED modified 20 homes for disabled individuals during 1991. There are no housing units in the county intended specifically for disabled persons; however, licensed residential care facilities for the developmentally disabled are available.

There are currently 13 small family-care homes in Nevada County that provide for the developmentally disabled. Of the 13 homes, five are for children under the age of 18 and eight are for adults. There are a total of 30 beds in the 8 homes operated for developmentally disabled adults. For the past two years, these homes have been fully occupied. There is an informal waiting list, but vacancies are filled as they become available based on recommendations from counselors of the Alta California Regional Center, a private, non-profit organization that contracts with the state of California to provide counseling assistance for the developmentally disabled.

According to Mr. Mike Alward of the Alta Regional Center, approximately 30 to 35 additional developmentally disabled individuals are living in Nevada County with their parents. These individuals will one day need to be placed in a home, unless other family members will assume responsibility for their care. Most of the time, these individuals will come under the care of the state when their parents are no longer able to care for them.

Additionally, Mr. Alward estimated that there were 10 to 15 individuals who were too independent to live in the small family-care homes, but not sufficiently independent to live on their own. Mr. Alward felt there was a need for clustered, group-care housing in Nevada County that would serve the developmentally disabled and provide a transitional step towards independent living.

Female Heads of Households

Female householders (no husband present) constitute an important part of the California housing market, since they accounted for more than one-fourth (27.6 percent) of the state's households. This group of householders includes female householder families, as well as women living alone and female householders living only with unrelated persons. In Nevada County, the importance of female householders is relatively less, since female householders comprised only 22.2 percent of total households.

Of the 6,449 households in Nevada County headed by women, about 60 percent consisted of women living alone. About 36 percent were family households of two or more persons and the balance were females living with other unrelated persons. In contrast, only 47 percent of female households in California consisted of one person, while family households and non-family households comprised 42 and 11 percent, respectively.

Family households headed by women numbered 2,345, and comprised 7.6 percent of all households (1990 Census data). Compared to the percentage for the state (11.5 percent), the incidence of female heads of family households in the county was relatively low. At both the county and state levels, approximately two-thirds of these households included children related to the female householder.

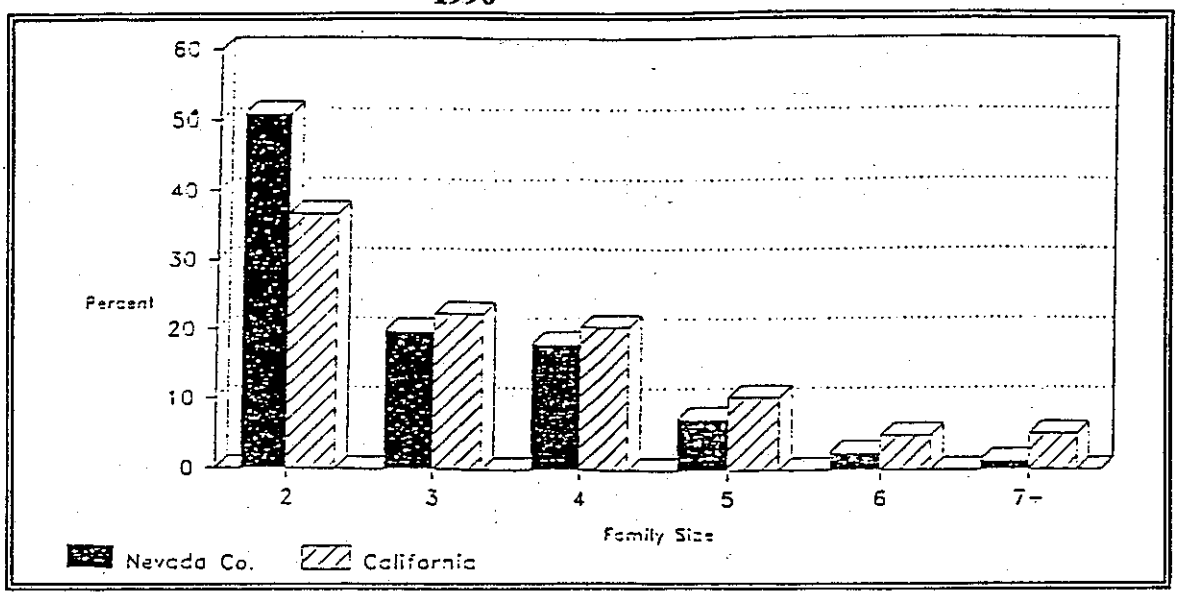
As a group, these family households headed by women are often subject to lower incomes, indicated by the 1,638 households receiving AFDC in Nevada County during 1992 (note: this is the total number of assisted households, since the Nevada County Department of Social Services does not maintain gender-based statistics). Beyond the need for lower-cost housing, the County recognizes ancillary needs for nearby child care and school facilities and other recreational services. While some of these households may find adequate support and employment in rural areas of the County, most will find the best combination of lower-cost housing, services and work located within urbanized areas with higher population densities.

Large Families

In 1990, the Census recorded 2,499 households in the County with five or more family members. The distribution of family households by size indicated that families in Nevada County typically are smaller than those throughout California. As indicated in Figure 4.4, more than 50 percent of all family households in the county consisted of only two persons, in contrast to about 37 percent state-wide. It is likely that many of Nevada County's two-person family households consist of married couples who are retired.

Very few of the county's families consist of six or more persons. Families of this size accounted for only 3.7 percent of all families, while state-wide they make up 10 percent of family households. The average family size in the county (2.88 persons) was also significantly lower than the average for California (3.32 persons).

Figure 4.4
FAMILY HOUSEHOLD SIZE
1990



At the census tract level, the percentage of large families (i.e., seven or more members) ranged from zero (tracts 10 and 11) to 6.9 percent (tract 12.01). Census tract 12.01 also contained the greatest number of larger families with 40 families of seven of more members.

These families typically require housing units with three or more bedrooms that often must be affordable to lower incomes, as indicated by 23 applicants waiting for Section 8 assistance for three and four bedroom houses (source: Nevada County Department of Housing and Community Services, 1992). The demands for water supply and sewage disposal to serve multi-bedroom housing units combine with the heightened needs of larger families for ancillary services such as nearby schools, parks and recreation facilities, employment, and proximate commercial and medical services. As with female-headed households, most large families will find their needs best accommodated within urbanized areas that have public infrastructure and services.

Group Quarters

According to the U.S. Bureau of the Census, emergency shelters, military barracks, dormitories, nursing homes and other institutions are not defined as housing units and therefore, are not part of the housing stock. Instead, this type of housing is referred to as group quarters. Group quarters may be a temporary source of accommodations for some persons or a permanent one for others, such as the infirm elderly.

In Nevada County, persons living in group quarters represent about 1.6 percent of the total population, in comparison to the state-wide proportion of about 2.5 percent. Overall, the growth in the number of persons living in group quarters (91 percent) significantly outpaced the population growth for the county (52 percent) (See Table 4.8). The reason for this relatively high rate of increase was the 266 percent change in the number of non-institutionalized "other persons" in group quarters. Most likely, these individuals were residing in a commune, such as the one located in the

San Juan Ridge community. The rate of growth for institutionalized persons (40 percent) was moderate and less than the county-wide population growth rate.

Table 4.9
GROUP QUARTERS
1980 - 1990

Group Quarters	Persons in Group Quarters	
	1980	1990
Institutionalized Persons	521	730
Correctional Institutions		83
Nursing Homes		466
Mental Hospitals		0
Juvenile Institutions		180
Other Institutions		1
Other Persons In Group Quarters	152	557
College Dormitories		44
Military Quarters		0
Homeless Shelters		17
Visible in Street Locations		2
Other Non-institutional Group Quarters		494
Total	673	1,287

Source: U.S. Bureau of the Census, 1980, 1990.

Farm Workers

In those parts of the state where migrant workers are used to harvest crops, seasonal housing is needed for the duration of the harvest. Nevada County's agricultural industry does not rely on the extensive use of migrant workers. According to the state Employment Development Department, 50 persons were employed in Nevada County's agricultural, forestry and fishing industry in 1989. This figure was projected by the state to remain unchanged by 1996. The 1990 Census counted three vacant housing units for migratory farm workers. Based on this information, it appears that housing for migratory farm workers is not a special need in Nevada County.

Emergency Shelter and Transitional Housing

Emergency Shelter. Nevada County's emergency housing supply consists primarily of rooms in the area's 32 motels and hotels. Of the almost 600 rooms available county-wide, approximately 70 percent are located in the western county. Homeless persons and families are provided financial assistance by a variety of local agencies, including the Nevada County Department of Social Services, the Nevada County Housing Development Corporation, and the Emergency Assistance Coalition.

The Department of Social Services (DSS) administers two programs which provide some assistance to the county's homeless population. The first program is funded by state Aid to Families with Dependent Children (AFDC) and provides funds for temporary and permanent housing assistance. The temporary housing assistance provides qualified clients with shelter for periods of up to three weeks. During fiscal year 1991, the department handled 174 requests for assistance. The DSS also provides funds from AFDC for permanent housing assistance. These funds are used to pay cleaning deposits and the last month's rent on apartments. The

department received 71 requests for permanent housing assistance during fiscal year 1991. The second program provides general relief assistance for single adults. This program served 117 persons during fiscal year 1989.

The Nevada County Emergency Assistance Coalition is funded and staffed by a variety of groups, including the county Housing Development Corporation, local churches, community organizations and government agencies. The Coalition provides vouchers for lodging, food and gasoline. The characteristics of the persons served and the type of assistance provided are summarized in Table 4.9.

Table 4.10
EMERGENCY ASSISTANCE SUMMARY
1991

Population	Number
Single Males	163
Single Females	52
Couples	142
Single Male Head of Household	6
Single Female Head of Household	46
Children	175
Assistance Provided	**Number**
Total Nights Lodging	236
Adults Served	308
Children Served	149
Total Meals	188
Adults Served	149
Children Served	37
Gasoline	135
No Financial Assistance Provided/Needed	88

Source: Nevada County Housing Development Corporation, 1992.

Transitional Housing. Transitional housing normally provides housing for an extended period of time. It also incorporates other social services and counseling programs designed to develop self-sufficiency through the acquisition of permanent housing and income. Within Nevada County, there are two transitional living centers operated by the Nevada County Housing Development Corporation. The two centers combined provide a total of 16 beds. Each center has three bedrooms.

According to Cindy Hermitt of the Housing Development Corporation, the centers are 95 to 100 percent full every night. Occasionally, the center cannot be filled if, for example, a family of three requires shelter and only one bed is available. On average, between three and six families per week call the centers requesting accommodations, but cannot be served because of the limited supply of beds. According to Ms. Hermitt, the number of calls for housing assistance is on the rise in comparison to past trends.

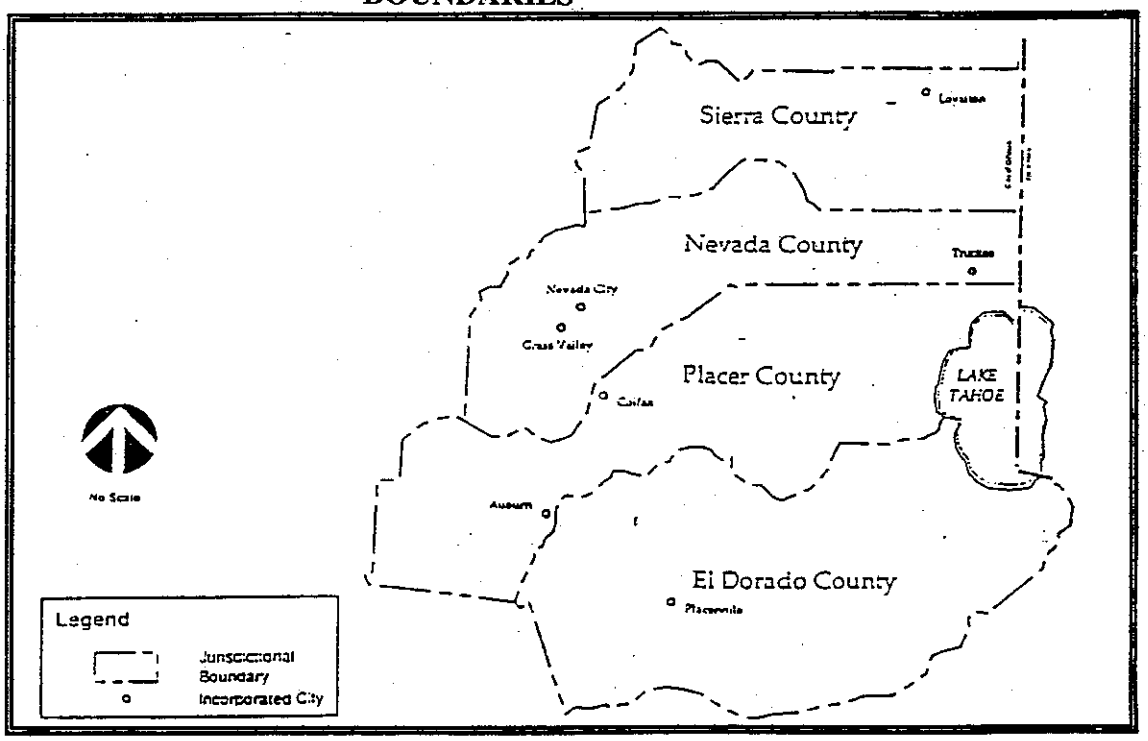
Recognizing un-met needs for emergency shelters and transitional housing, the Housing Development Corporation obtained a grant in 1992 to open a third transitional living center. The county assisted the Nevada County Housing Development Corporation in securing a $500,000 allocation to purchase, and another $170,000 to rehabilitate the Manzanita Inn for a homeless shelter. The 35-bed facility began operation early this year.

Housing Needs Projection

Regional Housing Needs Plan

The Sierra Planning Organization (SPO) is the agency responsible for the preparation of a Regional Housing Needs Plan (RHNP), pursuant to state housing law. Figure 4.5 displays SPO's jurisdiction, which covers a four-county area, including portions of Placer and El Dorado Counties, Sierra and Nevada Counties, and the cities of Nevada City, Grass Valley, Truckee, Loyalton, Placerville, Auburn and Colfax. The plan identifies the existing and future housing needs of all the communities within a region and serves as a guide to create interdependent management plans for the areas in that region. The housing needs determined in the plan are considered by SPO to be minimums. As part of the housing element, a land use analysis must be performed demonstrating that a jurisdiction has land available to meet the housing needs established in the RHNP.

Figure 4.5
SIERRA PLANNING ORGANIZATION JURISDICTIONAL BOUNDARIES



On March 23, 1993, the Town of Truckee incorporated a portion of eastern Nevada County. The Town's establishment affects the identification and assignment of existing and future housing needs that were part of the 1997 RHNP adopted in 1991. However, while the SPO has been active in preparing a draft for consideration by the Truckee and Nevada County governments, a revised plan has not yet been adopted. therefore for the purposes of this housing needs assessment, the 1997 RHNP adopted in 1991 has been used.

Table 4.11 displays the estimated 1990 distribution of households in Nevada County by income group. It should be noted that the household distribution for 1990

was estimated using the 1980 Census and California Department of Finance "Population and Housing Estimates" for January 1990.

Table 4.11
HOUSEHOLD DISTRIBUTION BY INCOME GROUP BY AREA
1990

Geographic Location		Income Group				
		Very Low[1]	Other Low[2]	Moderate[3]	Above Mod.[4]	Total
Incorporated -	Households	2114	892	1,090	1,341	5,437
	Percent of Total	39%	16%	20%	25%	100%
Grass Valley -	Households	1,61	705	871	954	4,148
	Percent of Total	8	17%	21%	23%	100%
		39%				
Nevada City -	Households	496	187	219	387	1,289
	Percent of Total	38%	15%	17%	30%	100%
Unincorporated -	Households	5,87	3,418	5,386	10,660	25,32
	Percent of Total	4	14%	21%	42%	1
		23%				100%
Nevada County -	Households	7,98	4,310	6,458	12,001	30,75
	Percent of Total	9	14%	21%	39%	8
		26%				100%

Notes:
[1] Very Low Income = Income not exceeding 50 percent of the median family income of the area.
[2] Other Low Income = Income between 50 and 80 percent of the median family income of the area.
[3] Moderate Income = Income between 80 and 120 percent of the median family income of the area.
[4] Above Moderate Income = Income above 120 percent of the median family income of the area.

Source: *Regional Housing Allocation Plan For Sierra Planning Organization*, April 1991.

As Table 4.11 indicates, the estimated household distribution was related to geographic location. For example, very low income households constituted 39 percent of Grass Valley's and 38 percent of Nevada City's households compared to only 23 percent for the rural unincorporated area households. This difference was expected, since the provision of affordable housing depends on the availability of urban public services, such as transit, schools, sewer and water, including the area now within the Town of Truckee.

In addition, 42 percent of the unincorporated area's households were in the above moderate income group. The unincorporated area of Nevada County is characterized by rural large lot development of single family homes. Many of these homes are served by private wells and septic tanks and depend entirely on the automobile for transportation. Therefore, development of affordable housing in the unincorporated area, particularly multi-family dwellings, typically is not feasible. This conclusion suggests that housing for very low and other low income group households should be provided for in the urbanized areas of Nevada County.

According to the 1997 allocation of households form the RHNP displayed in Table 4.12, a similar conclusion was not reached. Instead, the RHNP allocated 100 percent of very low income households and 97 percent of other low income households to the then unincorporated area of Nevada County. This final allocation

does not appear to consider the cost of providing affordable housing in an area that is largely without public services.

The RHNP allocation was available for review and comment by Nevada County, Grass Valley and Nevada City during the draft review period. During this review the County and incorporated cities had the opportunity to comment on the housing allocation and to request exchanges between unincorporated and incorporated areas. This was the only opportunity for reallocation.

Based on the allocation of housing needs in the 1997 RHNP, the housing element's land use analysis contained in Chapter 6 demonstrates that adequate land exists for the housing allocations within each income group.

Table 4.12
1997 HOUSING ALLOCATION
1993 (draft)

Geographic Location	Income Group				
	Very Low[1]	**Other Low[2]**	**Moderate[3]**	**Above Mod.[4]**	**Total**
Incorporated - Households	0	47	175	1,049	1,271
Percent of Total	0%	4%	14%	82%	100%
Grass Valley - Households	0	31	133	948	1,112
Percent of Total	0%	3%	12%	85%	100%
Nevada City - Households	0	16	42	101	159
Percent of Total	0%	10%	26%	64%	100%
Unincorporated - Households	2,821	1,461	2,098	3,165	9,549
Percent of Total	30%	15%	22%	33%	100%
Nevada County - Households	2,821	1,511	2,273	4,214	10,820
Percent of Total	26%	14%	21%	39%	100%

Notes:
[1] Very Low Income = Income not exceeding 50 percent of the median family income of the area.
[2] Other Low Income = Income between 50 and 80 percent of the median family income of the area.
[3] Moderate Income = Income between 80 and 120 percent of the median family income of the area.
[4] Above Moderate Income = Income above 120 percent of the median family income of the area.

Source: *Regional Housing Allocation Plan For Sierra Planning Organization*, April 1991.

Chapter 5 Preservation of Assisted Housing

Preservation of Assisted Housing

Government Code Section 65583 requires that the housing element analyze and program efforts for preserving assisted housing developments that are at-risk of conversion to market rate rents. Housing units are defined as "assisted" if the development or rehabilitation of those units was funded in whole or part through federal, state or local programs to provide affordable housing. Affected programs are listed below:

- Department of Housing and Urban Development programs:
  - Section 8 Lower-Income Rental Assistance project-based programs;
    - New Construction
    - Substantial or Moderate Rehabilitation
    - Property Disposition
    - Loan Management Set-Aside
  - Section 101 Rent Supplements;
  - Section 213 Cooperative Housing Insurance;
  - Section 221(d)(3) Below-Market-Interest-Rate Mortgage Insurance Program;
  - Section 236 Interest Reduction Payment Program;
  - Section 202 Direct Loans for Elderly or Handicapped; and
  - Community Development Block Grant program.
- Farmers Home Administration (FmHA) Section 515 Rural Rental Housing Loans;
- State and local multifamily revenue bond programs;
- Redevelopment Programs;
- Local in-lieu fee programs or inclusionary programs;
- Developments which obtained a density bonus and direct government assistance pursuant to Government Code Section 65916.

A housing development or unit becomes "at-risk of conversion" if the use restriction attached to the funding assistance is eligible for removal during the next ten years. This occurs for example when a property owner pays off a government subsidized loan. The purpose of the at-risk analysis is to identify actions (i.e., programs) the jurisdiction can take to preserve at-risk units, to adequately plan for preventing or minimizing tenant displacement and to preserve the local affordable housing stock. The following components are required as part of the at-risk analysis:

- Inventory of units at-risk of losing use restrictions;
- Cost analysis of preserving at-risk units versus replacing them;
- Resources for preservation;
  - Nonprofit entities capable of acquiring and managing at-risk projects;
  - Potential preservation financing sources and estimates of available funds;
- Quantified objectives (i.e., the number of at-risk projects and the units to be preserved); and
- Programs (i.e., efforts to preserve units at-risk of losing use restrictions).

At-Risk Inventory

Applicable public and private agencies were contacted to determine how many at risk units assisted by the Federal, State, and local governments exist in unincorporated Nevada County. This survey revealed the following:

- The U.S. Farmers Home Administration Section 515 funded the Truckee-Donner Congregate Project providing 60 units in eastern Nevada County and the Nevada City Senior Project providing 60 units in western Nevada County. According to the agency, federal regulations and case law make it virtually impossible for these units to convert to non-low-income housing units.

- The only HUD-funded program in unincorporated Nevada County is the Section 8 Rental Assistance Program. This program provides 188 certificates and vouchers to assist low-income families. According to the Nevada County Housing Development Corporation, this Program in on-going and will remain an effective affordable housing tool. However, some units may be at risk to the extent that, even with assistance, rents can exceed the ability of low-income families to pay.

- Three recently approved projects have not yet been built:

  - The Stonewood at Tahoe Housing Project in eastern Nevada County received a local density bonus of 15 low-to-moderate-cost units. Locally-imposed deed restrictions preclude conversion for 20 years.

  - Nevada Meadow on Old Tunnel Road (34 units) is funded through FmHA Section 515. Nevada Woods on Sutton way (78 units) is funded through the State Proposition 84 Program. Due to regulations associated with both programs, in both cases the conversion risk is extremely limited.

- Except as noted above, there are no housing projects in unincorporated Nevada County that are effected by State or local revenue bond programs, redevelopment programs, local in-lieu fee or inclusionary programs, density bonus programs, or direct government assistance programs.

The above information was gathered from the following agencies:

- U.S. Farmers Home Administration, Auburn, CA
- U.S. Farmers Home Administration, Stockton, CA
- U.S. Housing and Urban Development, Sacramento, CA
- State Department of Housing and Community Development
- Nevada County Housing Development Corporation
- Nevada County Department of Housing and Community Services

Agencies were specifically asked about the status of at risk units from the following programs: HUD Section 8, Section 101, Section 213, Section 221(d)(3), Section 236, Section 202, and Community Block Grant Program, FmHA Section 515, State and local revenue bond programs, redevelopment programs, local in-lieu fee or inclusionary programs, and density bonus and direct government assistance programs.

Cost Analysis

Although considered unlikely, the potential for conversion of the four projects does exist. Accordingly, a cost analysis that compares preservation costs against new construction costs is required by state law. Costs may be estimated on any order of magnitude that allows a comparison of costs to be made. For this study, two non-profit companies specializing in rehabilitation and construction of low income housing were contacted to determine cost differences in affordable housing preservation and construction. A brief description of each company and their determination regarding cost differences is provided in Table 5.1.

Table 5.1
PRESERVATION AND NEW CONSTRUCTION COST COMPARISON

Company	Contact	Cost Comparison Discussion
Project Go, Inc.	Lynda J. Timbers	Due to the high cost of planning, environmental analysis and providing infrastructure, new construction is more expensive than the preservation of existing units.
Rural Calif. Housing Corp.	Stanley Keasling	The Rural Calif. Housing Corp. has not constructed any low income housing projects that were lower in cost than preserving the same number of existing units.

Source: Harland Bartholomew & Associates, Inc., 1992.

Resources for Preservation

Preservation resources are categorized into nonprofit entities capable of acquiring and managing at-risk projects and potential preservation financing sources (including estimates of available funds). Two non-profit entities, Project Go, Inc. and the Rural California Housing Corporation, expressed their interest in acquiring at-risk projects in Nevada County. Project Go, Inc. has 14 years of experience in low-income housing construction, rehabilitation and management. The Rural California Housing Corporation has 25 years of experience in the construction of affordable housing, as well as recent experience in the acquisition of assisted housing.

Preservation Financing Sources

State law requires that each housing element identify and consider all federal, state and local financing and subsidy programs that could be used to preserve assisted housing for use by low-income residents. This analysis should include an estimate of the amount of each type of funds which could be available to preserve assisted housing. The financing sources which must be considered include the following:

- Community Development Block Grant Funds (CDBG);
- Redevelopment agency tax increment funds, including but not limited to those from the Low and Moderate Income Housing Fund; and
- Administrative fees (i.e., reserves) of any housing authority operating within the community.

The State of California administers the federal Community Development Block Grant program for non-entitlement cities and counties throughout the state. Non-entitlement jurisdictions include those cities with populations of less than 50,000 and counties with populations less than 200,000 that do not automatically receive U.S. Department of Housing and Community Development Block Grant Funds. Nevada County is one of the 180 small cities and counties in the state eligible to apply for these CDBG funds.

Since 1983, Nevada County has applied for nine and received five Community Development Block Grants. A $510,000 grant received in 1983 provided no- or low-interest loans to 37 households for housing rehabilitation. In 1985, a $556,000 grant provided similar home rehabilitation loans to 53 households. A $282,000 grant received in 1988 provided financial assistance to 69 households for sewer lateral installation and minor plumbing and bathroom rehabilitation. A grant for $500,000 in 1992 was received for rehabilitation of up to 24 units in Truckee. In 1993, the County received a $360,000 rehabilitation grant and the County has applied for another $500,000 rehabilitation grant for three different target areas to assist approximately 20 units. The county will continue to apply to the state for CDBG funds to address needs in western Nevada County. This money, if received, will be used to fund a variety of housing programs, including rehabilitation, land acquisition, handicapped access, and emergency home repair. If necessary, some of these funds could be used to preserve at-risk units.

The county has also received a FmHA grant to allow rehabilitation of approximately 10 to 12 units annually and a CHRP-0 $300,000 grant to allow rehabilitation of approximately 16 to 20 units.

The only redevelopment agency in the county is the Grass Valley Redevelopment Agency, which was established in 1989. Because of a legal dispute with the county, Grass Valley's redevelopment agency did not actually begin operations until February 1992. By state law, 20 percent of the tax increment funds collected by the agency must be used for housing programs serving low-and moderate-income households. These programs would be applicable to housing units within the city of Grass Valley, rather than the county as a whole. Since all four of the apartment complexes determined to be technically at risk of conversion were located in Grass Valley (See Table 5.1), presumably some funds from the city's redevelopment agency could be used for their preservation. Given the limited amount of time that the redevelopment agency has been in operation, it was impossible to

estimate the amount of redevelopment funds that might be available for the preservation of at-risk units.

The Nevada County Housing Authority was created in February 1992. Prior to its creation, the county typically would contract with local non-profit housing corporations for the administration of housing programs. The non-profit groups would then apply to the state for housing funds. Under this arrangement, no administrative fees accrued to the county. With the establishment of the Housing Authority, the county will be able to apply directly to the federal government for funding of housing programs and will have access to a broader range of programs and financial assistance. In addition, the Housing Authority will accrue fees for its administration of these programs which could be used for the preservation of at-risk units. Given the short amount of time that the Housing Authority has been in operation, it is impossible to estimate the amount of administrative fees that might be available for the preservation of at-risk units.

Chapter 6 Housing Production Opportunities

Designated Housing Sites

The Nevada County General Plan, in accordance with the Central Themes of the Plan, is based upon the concept of a balanced, self-sustaining community. This concept implies an equilibrium between the types of land uses that provide housing, commercial services and employment, as well as the amount and location of land areas designated for development of these uses. Also implied by the concept of a balanced community is an appropriate range and distribution of the different types of housing, which vary from Urban High Density (multiple-family development at 20 dwelling units per acre) to Rural-160 (single-family development at one dwelling unit per 160 acres).

The residential criteria used to establish a balanced land use pattern in the Nevada County General Plan are identified in the following sections of this chapter. The criteria which were used to determine the non-residential land use pattern are shown and discussed in **Section 6: Land Use, Circulation, and Infrastructure Analysis** of this Volume. Together, these criteria provide the bases for determining needs for the particular land use types that support a balanced community. The criteria address four major components to determine land use needs: population based upon projected density of residential development; mix of dwelling unit types, particularly the ratio of single-family and multiple-family units; provision of sufficient employment opportunities as measured by a jobs/housing balance; and mix of non-residential development types to provide a balance among employment types, and different types of commercial areas to provide a range of goods and services.

Population and Residential Density

The following criteria were used to determine the build out population for the General Plan, based upon the land use designations shown on the General Plan Land Use Maps:

Dwelling Units

The following densities in dwelling units per gross acre were used to generate dwelling unit data.

- Urban High Density Residential - 20 dwelling units per acre.

- Urban Medium Density Residential - 6 dwelling units per acre
- Urban Single Family Residential - 2.5 dwelling units per acre
- Residential - 0.66 dwelling units per acre
- Estate - 0.33 dwelling units per acre
- Rural - 5 - 0.2 dwelling units per acre
- Rural - 10 - 0.1 dwelling units per acre
- Rural - 20 - 0.05 dwelling units per acre
- Rural - 30 - 0.033 dwelling units per acre
- Rural- 40 and Forest 40 - 0.025 dwelling units per acre
- Rural-160 and Forest 160 - 0.00625 dwelling units per acre

These figures represent gross acres. To provide figures for net acres (representing the actual developable area) a factor of 0.85 was applied to the number of dwelling units for the Urban Single Family Residential, Residential, and Estate categories; and a factor of 0.9 was applied to the dwelling units generated in the other categories. The resulting numbers provide the anticipated dwelling units for each residential land use type at build out, as shown in Table 6.1.

Population

A ratio of 2.15 persons per dwelling unit was used to generate population data. This is a weighted average for the 1990 U.S. Census figures of 2.4 persons per dwelling for the western County and 1.8 persons for the eastern part of the county.

Dwelling Unit Types

The mix of dwelling unit types is an important consideration in the development of a balanced community. Of particular importance is the mix between single-family and multiple-family residential units. In addition to a means for providing housing choice, this mix addresses the need for affordable housing, which typically requires higher densities of development. A criteria of 70 percent single-family residential units and 30 percent multiple family residential units was used to establish the mix of dwelling unit types for the County as a whole. This ratio is comparable to that for the State of California, which is a ratio of 33 percent for multiple-family units, and 67 percent for single-family units.

Land Use Needs and Build out Characteristics of the General Plan

The land use needs resulting from application of the criteria in the previous sections are reflected in the land use pattern shown in the General Plan Land Use Maps. The acreage shown on the maps were measured and tabulated by land use designation. Table 6.1 summarizes the residential land use acreage, along with the projected dwelling units and population at build out of the Nevada County General Plan in both the unincorporated territory and Town of Truckee (assuming build out of the current General Plans of Grass Valley and Nevada City within their current municipal boundaries). Projected employment is shown in **Section 6: Land Use, Circulation, and Infrastructure Analysis** of this Volume.

At build out, the total projected population of the County would be 181,000 persons, in 84,510 dwelling units. Approximately 30 percent of the total dwelling units would be in the Urban High Density and Urban Medium Density designations,

which provide for multiple-family housing, and 3 percent would be in "granny" flats distributed among all residential designations.

Table 6.1
DRAFT GENERAL PLAN
RESIDENTIAL CARRYING CAPACITY
BUILDOUT

Land Use Designation	Acres	Dwelling Units	Population
Within unincorporated areas:			
Urban High Density Residential	370	6,660	15,984
Urban Medium Density Residential	930	5,022	12,053
Urban Single Family Residential	4,110	8,734	20,961
Residential	8,485	4,760	11,424
Estate	19,290	5,411	12,986
Rural-5	43,905	7,903	18,967
Rural-10	46,680	4,201	10,083
Rural-20	33,710	1,517	3,641
Rural-30	19,980	593	1,424
Rural-40	37,065	834	2,002
Rural-160	0	0	0
Forest	331,875	2,365	5,085
Planned Residential Community	7,065	7,490	17,976
unincorporated total	553,465	55,490	133,176
Within the Town of Truckee:			
Urban High Density Residential	305	5,490	9,880
Urban Medium Density Residential	495	2,675	4,810
Urban Single Family Residential	1,690	3,590	6,465
Residential	1,255	705	1,265
Estate	4,045	1,135	2,040
Rural-5	0	0	0
Rural-10	930	85	150
Rural-20	0	0	0
Rural-30	0	0	0
Rural-40	0	0	0
Rural-160	1,730	10	20
Forest	1,910	10	20
Planned Residential Community	3,915	6,100	10,980
Truckee total	16,275	19,800	35,630
UNINCORPORATED COUNTY			
AND TRUCKEE TOTAL	**569,740**	**75,290**	**168,806**

Source: Nevada County General Plan; Harland Bartholomew & Assoc., Inc.; 1994

Table 6.2
UTILIZATION OF DESIGNATED DENSITY
BY RECENTLY DEVELOPED PROJECTS
1992

Project (alphabetical order)	Developed Density (dwelling units/ac.)	Designated Density[2] (dwelling units/ac.)	Density Utilization[1]
Alta Meadows: subdivision	0.32	0.59	54%
Banner Forest Estates: subdivision	0.2	0.22	91%
Black Oak Estates: subdivision	0.1	0.063	159%
Cambridge Estates: subdivision	0.89	0.7	127%
Canyon Creek: three unit subdivision	0.2	0.22	91%
CBM Group: senior apartment complex	30	13	230%
Champion Estates: subdivision	0.19	0.22	86%
Harris: subdivision	0.025	0.063	40%
Hidden Glen: subdivision	0.45	0.59	76%
Olympia Gardens: apartment complex	20	13	139%
Patterson Valley Ranches: subdivision	0.069	0.063	110%
Prosser Woods: subdivision	0.2	0.22	91%
Rock Creek Estates: subdivision	0.26	0.22	118%
Stonewood at Tahoe: condominium complex	15.6	13	120%
The Cedars: subdivision	0.67	0.59	114%
Wildwood Estates: Phase 1 of subdivision	4.4	5	88%

Notes: [1] (Developed Density/Designated Density) * 100%
[2] Average of Allowable Build out Range

Source: Nevada County General Plan, Nevada County Planning Department; 1992

Assessment of Existing Housing Site Supply

The draft general plan provides an abundant amount of residential land: more than 234,000 acres, excluding land designated Forest and Rural-160 (See Table 6.1). Of this amount, only 28 percent or slightly more than 66,700 acres was determined to be developed based on the results of a county-wide land use survey conducted during

1991. The remaining 167,300 acres (72 percent) were vacant. The same survey showed 13 acres of land developed for high density residential use. The General Plan designates an additional 805 acres of vacant land for such uses, providing for 14,440 more multi-family units.

To determine whether designated density classifications accurately reflect development potential in Nevada County, recently developed densities (defined as subdivisions recorded or construction projects occupied from the beginning of 1991 to the middle of 1992) were compared to the designated densities of project properties.

While Table 6.1 represents build out of all lands designated as Urban High Density at maximum capacity, actual development will be affected by site-specific capabilities and constraints. However, infrastructure capabilities and land suitability were considered for locating each residential land use type. These issues are discussed in the next chapter of this section, **Section 5: Resources Capability Analysis**, and **Section 6: Land Use, Circulation, and Infrastructure Analysis** of this Volume. Appropriate location of land use designations, combined with a historic trend toward substantial utilization of designated density by development projects (reflected in Table 6.2) increase the likelihood that most of the projected dwelling units will be available as part of the county's future housing supply.

Existing Multi-Family Housing Sites

To determine whether the county's supply of vacant, higher density residential land was adequate, it was compared to the construction goals established in the 1997 Regional Housing Needs Plan for Nevada County (discussed previously in Chapter 4 of this Section). The draft Plan establishes goals for the construction of very low- and other low-income housing units by 1997. The prospective allocation of these housing units is 4,285 to the unincorporated County including the area now within the Town of Truckee. While not all of these affordable units must be multi-family dwellings, given the economics of land development it is unlikely that many low-income housing units will be constructed on larger lots of 1.5 or more acres. If this assumption is correct, then the location of these units would effectively be limited to higher-density residential areas.

As shown in Table 6.3, the projected total capacity of the higher-density land available is 19,847 units. The Regional Housing Needs Plan calls for the construction of a total 4,285 units to house very low- and other low-income households in Truckee and the County by 1997. All of these affordable units could be constructed on land designated for the highest density residential development, without substantially exhausting the planned supply of 12,150 units (5,490 units in Truckee and 6,660 units in unincorporated Nevada County). In addition, the plan anticipates that an additional 2,500 "granny" flats would be developed.

Potential Housing Sites

The Nevada County Housing and Community Services Department, though the efforts of a local, non-profit housing consultant, has studied potential sites for the development of affordable housing over the next three to five years. The preliminary study was one of the best available sources of information on parcels that might be

able to support affordable housing projects producing up to 280 housing units, of which at least 201 units are available to people earning incomes less than 80 percent of the median income range for Nevada County.

Table 6.3
HIGHER DENSITY RESIDENTIAL LAND DISTRIBUTION
DRAFT GENERAL PLAN BUILDOUT

Higher-Density Land Use Designation	Acres	Percent of Total Higher-Density Acres
unincorporated County:		
Urban High Density	370	18
Urban Medium Density	930	44
Town of Truckee:		
Urban High Density	305	14
Urban Medium Density	495	24
Total	2,100	100.0
Potential Dwelling Units	19,847	N/A
Percent of Total Dwelling Units	26%	N/A

Source: Nevada County General Plan; Harland Bartholomew & Associates, Inc.

Using computer records from the Nevada County Assessor's Office, approximately 1,740 parcels were evaluated based on property size, existing improvements, road access, existing zoning, utilities, public transportation and schools. Based on this analysis, groups of parcels thought to be suitable for affordable housing were identified and mapped. The mapped locations included the areas in and around Nevada City, Grass Valley, Alta Sierra, Penn Valley and North San Juan. In addition, the sites were placed in one of three categories:

Infill - properties typically, but not always located in incorporated areas;

Annexable - properties located on the fringe of more-densely settled areas that could connect to existing infrastructure; and

Rural - properties in non-urban areas where decentralized infrastructure would be needed for development to occur.

After several evaluative iterations which assessed site suitability and financial feasibility, the study identified 6 sites within the western county that were determined to be practical for development of publicly affordable housing according to the criteria of the study. Of these, one parcel was rural and five parcels were annexable. Given the preliminary nature of this site assessment study, it is impossible to conclude that all of the sites identified will actually be utilized to develop affordable housing.

Chapter 7 Housing Production Constraints

Non-Governmental Constraints

Land Cost and Availability

The economic concept of supply and demand applies to the cost of land in Nevada County. When the supply of land is limited, its cost is driven up, which in turn affects the cost of housing. How much the cost of housing increases, however, usually depends on the level of demand.

Since one household is equal to one occupied dwelling unit, household growth is the principal indicator of growth in housing need. Together with income, it is also a key indicator of growth in housing demand. From 1980 to 1990, California's rate of household formation was approximately 20 percent. During this same period, the number of households in Nevada County grew at a rate more than two and a half times that of the state. Moreover, the number of households in the county has been projected to increase 41.4 percent between 1990 and 2000 (See Table 2.5). Again this increase would be approximately double the California average for the same period.

Given high rates of household and population growth coupled with a limited amount of higher-density residential land, it was hypothesized that housing costs in Nevada County would tend be higher than those of surrounding areas. To test this hypothesis, data on housing costs in Nevada County were compared to similar information for the Sacramento area (See Table 7.1)

Table 7.1
HOUSING COST COMPARISON
1990

Home Size	Nevada County[1]	Sacramento Area[1]
1,400 - 1,500 Square Feet	$116.00	$104.00 - $106.00
1,500 - 1,900 Square Feet	$118.00	$106.00 - $108.00
1,900 - 2,300 Square Feet	$128.00	$116.00 - $118.00

Notes: [1] Housing cost per square foot.

Source: Market Directions, Inc., 1992.

As Table 7.1 indicates, housing costs in Nevada County were approximately 10 percent higher than in the surrounding Sacramento area. These higher housing

costs were most likely associated with higher land costs due to excess demand during a period of rapid growth. Since median housing prices are marginally affordable for those households earning the median income level in Nevada County, land costs for developable sites pose a constraint in the development of housing (See Figure 4.3).

Multi-Family Land Costs

Land costs for multi-family housing vary widely depending upon location, parcel size, topography, environmental constraints, and infrastructure availability. However, typical cost-per-acre appears to vary between $115,000 to $150,000. Land costs for multi-family housing is normally determined on a cost-per-unit basis, and can vary from $7,500 to $10,000 per unit. Current local construction costs per square foot vary from approximately $48 to $60 (Building Valuation data, Building Standards Magazine, April 1992). It is the Nevada County Building Department's view that the true costs is at the higher end of this range. In discussions with developers of low-income multi-family housing projects, it appears that land costs, rather than construction costs, remain a primary constraint to affordable multi-family housing.

Financing

Financing availability can be a constraint to housing development if an equal opportunity to obtain financing is not available throughout a geographic area. An equal opportunity to receive financing may not exist if lending institutions practice discrimination in lending based on a project's location. Geographic discrimination is typically referred to as *redlining*. Redlining has been shown to occur in lower income urbanized areas where property values are low due to the area's socio-economic characteristics.

To determine if redlining occurs in Nevada County, information pertaining to the Home Mortgage Disclosure Act (HMDA) and Community Reinvestment Act (CRA) was requested from the following lending institutions:

- Bank of America;
- Truckee River Bank; and
- El Dorado Savings and Loan Association.

HMDA reports were received from each lending institution. None of the reports provided home mortgage loan data specific to Nevada County since the county is not located within a metropolitan statistical area (MSA).

Community Reinvestment Act Performance Evaluation reports prepared by the Federal Deposit Insurance Corporation (FDIC) were received from both the Bank of America and the Truckee River Bank. The CRA report for Bank of America aggregated all rural areas in California into one category and therefore was not useful for making conclusions regarding Nevada County. On the other hand, the Truckee River Bank's report did provide specific information regarding the bank's lending practices.

According to the FDIC, a review of various credit applications and credit extension did not reveal any evidence of discriminatory practices or procedures. The bank did not use a credit scoring system, but rather analyzed the applicant's request

for credit based upon creditworthy standards. The FDIC found no evidence of discriminatory practices or procedures, or other illegal credit practices.

The FDIC indicated that the bank had not participated in any local community development or redevelopment projects and was not aware of any such projects being developed within its communities. The bank's officers indicated a willingness to participate in community development projects that were consistent with the bank's financial condition and size. According to the FDIC, several low- and moderate-income housing projects within the bank's lending area had been proposed by private groups.

Financial Assistance

There are over sixty funding sources or programs available at various times for a range of affordable housing projects. Some examples are listed below:

County

During 1991 and 1992, the Nevada County Board of Supervisors supported affordable housing with general funds as follows:

- Creation of the new Department of Housing and Community Services and Housing Authority.
- Assistance to the Nevada County Housing Development Corporation by funding the Emergency Homeless Services Coordinator position and costs associated with securing the homeless shelter at the Manzanita Inn.
- County General Funds can be used with Board of Supervisors approval for pre-development expenses, site acquisition, project planning costs and gap financing for construction and/or mortgages. Due to severe budget constraints, however, it is highly unlikely that local funds will be available for affordable housing, except for short-term loans or small start-up allocations of funds.

State

California Housing Rehabilitation Program for Owner-occupied Housing (CHRP-O). The county received $3000,000 in 1991 for up to 18 rehabilitation loans for very low and low income households, and expects to apply for future funds if voters approve new housing bond measures to fund the program.

California Housing Rehabilitation Program for Renters (CHRP-R). The county hopes to apply for these State bond funds to assist owner-investors rehabilitation of rental housing for low and very low income households.

Community Development Block Grant (CDBG). The county will apply annually for these funds to address rehabilitation needs in Western Nevada County, as well as other affordable housing development needs, such as site acquisition and gap financing.

Community Development Block Grant (CDBG) Technical Assistance Grants. The county received $30,000 in 1991 for a Housing Conditions Survey and an affordable housing site inventory, and applied in July 1992 for $30,000 for

additional housing conditions analysis and a needs assessment. The County expects to apply annually for the maximum available to perform a variety of planning and affordable housing related studies and analysis.

Community Development Block Grant for Economic Development. The county intends to apply for $3000,000 to $500,000 annually for funding of affordable housing and other projects aimed at job retention and creation.

New Construction Rental Program. The county has supported to local non-profit housing corporations, as well as for profit builders, who have applied for these funds to construct rental housing for low and very low income families. The county and Housing Authority expect to be very active in this program should funds be available in the future through voter approved bond measures.

Pre-development Loan Fund. As projects for development materialize, the county and Housing Authority will apply to the State for these funds to cover typical pre-development expenses.

Family Demonstration Project. The County Housing Authority is interested in building a rental housing complex for about 20-24 very low income utilizing Section 8 Family Self Sufficiently certificates and vouchers and Head Start funding to provide comprehensive on-site services to assist such families to become free of public assistance and move toward self-sufficiency. Project depends on availability of voter approved bond funding.

Community Services Block Grant. The county, through its Community Action Board, administered by the County Department of Housing and Community Services, annually uses a portion of its allocation to support affordable housing activities, such as the local non-profit housing development corporation, the local Emergency Housing Coalition homeless services, Legal Aide services and the Domestic Violence Coalition.

Federal

Section 8 Rental Assistance Program. Having formed a new public housing authority in 1992, the County applied for and received 16 certificates and 16 vouchers under the new Section 8 Family Self-sufficiency program. The Housing Authority will apply for new units as Notices of funds Availability (NOFA's) are published. The Authority expects a new allocation of 25 to 50 certificates and vouchers annually in the future.

HOME Funds. The Housing Authority will apply for an allocation of HOME funds, the new HUD program, to create a program for first time home buyers. Also, if allowed the Authority will apply for HOME funds for new construction of low income rental housing.

Mortgage Credit Certificate (MCCs) Program. In 1992 the county received its first allocation of $15 million to issue MCC for 100 to 120 first-time home buyers. Should Congress extend the authority to issue MCC, the county plans to apply regularly for the rural maximum of $20 million.

Single-Family Mortgage Revenue Bonds (SF-MRBs). The county plans to be active in this program, should Congress extend the authority to issue SF-MRBs. The County Housing Authority is considering creating a joint powers authority with

other rural jurisdictions and authorities to issue SF-MRBs in order to reduce the cost of issuance.

Multi-family Mortgage Revenue Bonds (MF-MRBs). Again, should Congress grant the authority to issue MRBs, the Housing Authority plans to work with local developers of rental housing to provide this type of financing available in Nevada County.

Low Income House Tax Credits (LIHTC). Should Congress make this financing available, the Housing Authority will work with local developers to make this form of financing available.

Farmer's Home Administration Section 523 - Self-Help. The Housing Authority intends to develop one or more projects over the next five years using this financing to assist low income residents achieve home ownership through sweat equity and lowered monthly mortgage payments.

Other Sources of Funds

Community Reinvestment Act Funds. The county Housing Director participates in the Affordable Housing Council sponsored by the Nevada County Business Association. The Council was established in conjunction with a consortium of local banks, known as Fair Lenders Action Group (FLAG). One role of the Council is to review affordable housing development proposals seeking CRA funding from FLAG. The FLAG has committed $1,750,000 to an initial local pool to fund such projects.

Tahoe-Truckee Housing Development Corporation. The county Housing Director assisted a group of businesses and community leaders in the Truckee area in the creation of a new non-profit housing development Corporation. Truckee River Bank has provided start-up revenue, a line of credit and low cost office space to the newly formed corporation.

Federal Home Loan Bank Affordable Housing Program. The County will pursue funds associated with this program that will finance construction of low-income housing.

Construction Costs

The cost of land in Nevada County was one of the major factors influencing housing cost. Other construction costs that may also play a role in high housing costs include those for labor and materials. According to the Construction Industry Research Board (CIRB), construction costs in Nevada County are actually lower than in Placer or Sacramento Counties. Table 7.2 compares local construction cost multipliers developed by the CIRB.

Table 7.2
CONSTRUCTION COST COMPARISON
1992

County	Local Construction Cost Multiplier[1]	Percent Above Average Square Foot Cost
Nevada	1.18	18%
Placer	1.20	20%
Sacramento	1.21	21%

Notes: [1] Average square foot construction cost multiplier for frame constructed residential units.

Source: Construction Industry Research Board, 1992.

The data in Table 7.2 demonstrate that construction costs per unit in Nevada County are lower than in surrounding counties. This information suggests that construction costs are not a constraint to housing development in Nevada County. Instead, the data support the conclusion made earlier that Nevada County's higher land costs are the primary constraint to affordable housing development.

Infrastructure

The supply of vacant land designated and available for housing development is predominantly based upon the availability of domestic water supplies and sewage disposal capabilities. In addition to this discussion of housing production constraints, water and sewage infrastructure constraints are addressed in the **Section 6: Land Use, Circulation, and Infrastructure Analysis** of this Volume. While existing water supply and/or sewage disposal capabilities may impede current development in some instances, the service providers have indicated that planned service capabilities are adequate for development of the total regional share need within the 1992 to 1997 period.

Waste water. In western Nevada County, urban-level waste water collection and treatment are provided by the cities of Grass Valley and Nevada City and the Nevada County Department of Sanitation. In the eastern county, this service is provided by the Truckee Sanitation District, the Tahoe-Truckee Sanitation Agency (also serves northern Placer County) and the Donner Summit Public Utility District. In general, the areas served by these entities are not contiguous. Table 7.3 summarizes current design and average flows for the waste water treatment systems. About 40 percent of the western county's residences are provided service by these agencies.

In the eastern county, most of the existing development is sewered. The State of California Regional Water Quality Control Board, Lahontan Region, which regulates the area's water quality, requires most new development to be sewered. It is likely that the Board eventually will require all sewage discharge to be collected and treated prior to disposal.

Most public waste water treatment systems in the County have available design capacity to accommodate growth during the Housing Element planning period. The extension of collection lines from the areas currently served by sewers is another

means of allowing higher density development. However, improvements to treatment and conveyance systems in the western County, and extensions of the conveyance system in the eastern County will be necessary to meet demand at General Plan build-out. The installation of new lines will be costly, since steep slopes, shallow soils, boulders and rock outcroppings are constraints which will result in higher-than-normal excavation costs. For example, the City of Grass Valley has begun work on sewer plant improvements that will serve a population of 28,000 (including unincorporated area in the County) during the planning period. The City has also waived the moratorium on new sewer hook-ups for multi-family affordable housing projects in the County. In the eastern County, all lands currently zoned for multi-family housing development are within the Truckee Sanitary District, but may require extension of the sewage conveyance system to hook-up to the Tahoe-Truckee Sanitation Agency treatment facility. To reduce the effect of public waste water collection and treatment system limitations upon housing production, residential land-use densities dependent upon connection to large-scale public sewage treatment and disposal systems are located within a public service area and within close proximity to the existing sewage conveyance system (Policy 8.18).

Table 7.3
SEWAGE COLLECTION AND TREATMENT PROVIDERS

Service Provider	Customers	Population	Design Flow (GPD)	Average Flow (GPD)
Western County				
Nevada County Department of Sanitation				
Lake Wildwood	3,430	9,100	1,120,000	450,000
Lake of the Pines	1,880	5,000	720,000	400,000
Kingsbury Greens	45	120	12,000	3,500
North San Juan	80	210	24,400	6,200
Gold Creek Park	44	120	14,500	6,000
Penn Valley	265	700	90,000	25,000
Mountain Lake	47	120	11,750	1,500
Cascade Shores	94	235	80,000	25,000
Subtotal	5,885	15,605	2,072,650	917,200
City of Grass Valley	4,530	12,000	1,550,000	1,272,000
City of Nevada City	1,131	3,000	690,000	400,000
Subtotal	5,661	15,000	2,240,000	1,672,000
Total Sewered	11,546	30,605	4,312,650	2,589,200
Total Septic Tanks	17,440	46,230		
Eastern County				
Truckee Sanitary District	5,912	N/A	N/A[1]	1,007,000
Tahoe-Truckee Sanitation Agency	N/A	N/A	7,400,000	5,410,000
Donner Summit Public Utility District	545	N/A	820,000	520,000
Total Sewered	N/A	N/A	8,220,000	6,937,000
Total Septic Tanks	1,400	N/A		

Notes: N/A = Not Available.
[1] All flows discharged to Tahoe-Truckee Sanitation Agency Treatment Plant.

Source: Jones and Associates, 1991.

Because the service area of the western county's waste water collection systems is limited, more than 17,000 (60 percent) of the total residences in the western county discharge to septic tanks with leach fields. The County's minimum building site requirements for on-site sewage disposal are designed to ensure long-term functionality and public safety for the broad range of soil types and depths in Nevada County. Specifically, residential lots served by septic tanks must be at least 3 acres in area if water is obtained from a well on the property or 1.5 acres if water comes from a treated supply or other source. One result of this requirement is that residential development in much of the County will be low density. Conversely, the locations most suited for higher density residential development are those within or adjacent to the service areas of existing waste water collection and treatment providers.

Actions to reduce housing production constraints due to on-site sewage disposal standards are limited by the State's primacy in this regulatory arena, and must maintain the balance between public health effects and development intensity in areas not served by sewers. Increasing the allowable density for septic tank users is not feasible because most of the soils in the western part of the county have severe limitations for the installation of septic tanks and leach fields, according to the U.S. Soil Conservation Service. Typically, these soils are either less than four feet deep, have slopes greater than nine percent or have poor percolation rates.

Water. In most years, the quantity and quality of the county's water is good. The western county is served primarily by the Nevada Irrigation District and the cities of Nevada City and Grass Valley. In the eastern county, the primary purveyors are Truckee Donner Public Utility District, the Donner Summit Public Utility District, Donner Lake Utility Company and Glenshire Mutual Water District. The most recent annual production and the number of customers served by these entities is shown in Table 7.4.

Between 35 and 40 percent of the residential development in the western county is served by private wells. Ground water supplies in most of the County are adequate, although continued drought conditions may result in localized ground water level reductions in perched or fractured-rock aquifers. In the past several years, some of these wells have gone dry or have had to be lowered. There is inadequate historical data to determine whether this situation was caused by the prolonged drought or from over drafting of aquifers.

There also was little information available on the quantity and quality of wells on private property in the western county. Officials of the Nevada County Department of Environmental Health are concerned with the long-term impact of septic systems on the chemical and bacterial constituents in the ground water; in particular, the accumulation and effect of nitrates.

Given these concerns, it is unlikely that the County would modify the current minimum lot sizes in those areas which will be served by private wells and septic tanks. This situation precludes the development of higher density (and presumably more affordable) housing in much of the western county. While all of the public water districts serving properties within Nevada County possess adequate water rights and sources to provide domestic service over the planning period, treatment and conveyance facilities to serve demand at General Plan build-out do not currently exist. Given topographic and geologic constraints, extending water supply lines to serve large areas of the county currently without water service will be costly. To reduce the

effect of public treated water system limitations upon housing production, residential land-use designations dependent upon this service are located within a given purveyor's service area and within close proximity to the existing delivery system.

Governmental Constraints

Codes and Enforcement

As is the case with numerous other jurisdictions, Nevada County has implemented the provisions of the Uniform Building Code, Uniform Housing Code, Uniform Plumbing Code and National Electrical Code with certain amendments. According to Chris Thomas of the Nevada County Building Department, the purpose of any amendments or modifications to the codes typically is to provide additional clarification or to take account of local conditions rather than to impede residential development.

Table 7.4
WATER SERVICE PROVIDERS

Service Provider	Customers	Annual Production (MG)
Western County		
Nevada Irrigation District[1]	12,595	1,542.9
City of Grass Valley	2,105	104.0
City of Nevada City	1,177	162.4
Washington County Water District	125	1.0
San Juan Ridge County Water District	22	19.6
Total Public Supply	16,024	1,829.9
Total Wells	10,000	N/A
Eastern County		
Truckee-Donner Public Utility District	5,161	1,044.8
Donner Lake Utility Company	1,200	N/A
Donner Summit Public Utility District	234	0.1
Glenshire Mutual Water Company	1,428	117.5
Total Public Supply	8,023	N/A
Total Wells	100	N/A

Notes: N/A = Not Available.
[1] Includes northern Placer County.

Source: Jones and Associates, 1991.

For example, the county has implemented snow loading standards for roofs that are related to the elevation at which the structure is located. This interpretation, while more stringent, is logical since it relates the structural strength of the roof to the volume of snow that could reasonably be expected at higher altitudes. Similarly, the

county has passed grading and driveway ordinances that account for the steep terrain commonly found in much of the county. While these measures may add some expense to the cost of residential development, they also protect the health, safety and general welfare of the county's residents. Finally, the county requires Class A, fire-retardant roofs on all new construction. This ordinance, which effectively requires metal, tile, or composition roofing on new structures, was passed after the disastrous 49'er Fire in 1986. While more restrictive, the ordinance was designed to address the local risk of wildfires.

Builders of affordable housing recognize that zoning ordinance procedures and standards for architectural design, open space retention, building height and setbacks, and parking lot improvements present actual constraints to developers, since compliance with these standards increases project costs. Policies in the General Plan (**Chapter 8: Housing** in Volume 1) include program actions to remove or mitigate, where legally possible, governmental constraints to the maintenance, improvement, or development of affordable housing. For example, one policy provides a 10% density bonus for subdivisions to create low-cost lots for development of affordable housing on land designated for higher-density residential development. This program can contribute 134 new lots over the planning period (based upon projection of the development rate reflected by Table 6.3). While another potential source of low-cost lands is surplus government property, the County does not have excess property suitable for residential development, and policies of both the U.S. Forest Service and Bureau of Land Management discourage or prohibit residential development on surplus federal lands. Ironically, while builders acknowledge costs added by County development standards, most say the major constraint upon housing production is one over which the County has no authority: school fees.

Nevada County's zoning ordinance contains numerous features designed to increase the allowed density of residential development:

Mobilehomes. Pursuant to state law, the county allows mobile homes and factory-built housing in any zoning district that allows single-family residential, provided they are placed on a permanent foundation. The ordinance requires that the mobile homes must have been constructed in accordance with certain state or federal safety requirements. In addition, permits for water supply and sewage disposal must have been obtained from the Nevada County Department of Environmental Health. Lastly, evidence that any vehicle license on the unit has been relinquished must be submitted to the Building Department, in order that the unit can be subject to real property tax rather than state vehicle licensing fees.

Recreational Vehicles. The county allows the occupancy of a motor home, travel trailer or camper as a temporary dwelling while an individual is building his or her primary residence or if a property owner's home has been damaged or destroyed by fire, flood or earthquake. The ordinance requires the occupant to obtain a temporary living permit from the Planning Director (or his designee) that is good for up to two years. As a condition on the permit, the recreational vehicle must be connected to an approved water supply and sewage disposal system.

Second Dwellings. Pursuant to state law, the county allows for a second residential unit on all lots that allow single-family residences. The primary restrictions on the construction of a second unit are that the property owner must obtain a conditional use permit and that the second unit be consistent with the density allowed on the General Plan or Zoning District Map. Implementation of Housing

Policy 8.2b will make second dwellings a permitted use by right, regardless of General Plan or zoning density.

Cottage Housing for Senior Citizens. Pursuant to state law, the county allows a second residential unit for senior citizens on all lots that allow single-family residences. The principal restrictions are that the resident must be for the sole occupancy the physically handicapped or of one or two persons age 60 or older, and that a conditional use permit must be obtained from the county. Implementation of Housing Policy 8.2a will eliminate the conditional use permit requirement, and ensure affordability by limiting the dwelling unit size to 1200 square feet of gross floor area.

Density Bonus for Senior Citizen Housing. The county has developed procedures, standards and a density bonus for the development of senior citizens apartments and independent living centers for use by persons age 55 and older. These projects require the issuance of a conditional use permit and must meet certain other minimum standards. The density bonus provides for five to 25 percent more units than otherwise allowed under existing zoning or General Plan designation depending upon the project's conformance with certain criteria. On-site parking requirements can be reduced between 5 and 10 percent using the same criteria. Implementation of Housing Policy 8.3 will increase the potential density bonus to 50 percent; substantially reduce or eliminate open space, parking, landscaping, setback, building height and lot coverage standards; reduce fees and streamline the permit review process for projects that develop housing for senior citizens.

Planned Developments. In those areas where the General Plan designation provides for a planned development, the county allows the construction of either single- or multi-family units, as long as the total density provided does not exceed the density allowed by the plan.

Employee Housing. The county allows employee housing to exceed the density authorized by the zoning ordinance or the General Plan if the applicant can demonstrate that an exceptional need exists for full-time employees.

On- and Off-Site Improvements

The county requires residential development to pay at least a portion of its fair share of the cost of public facilities. The following paragraphs summarize the county's fees and requirements for a variety of on- and off-site improvements. While the Town of Truckee has not yet established its own fees and requirements, costs for of public facilities within the Town will probably be consistent with the following descriptions.

Roads. The county requires that all new construction have access either to a county highway, public road, or private road. The county further requires that the dwelling be located on the lot so as to provide safe and convenient access for servicing, fire protection and required off-street parking. The fees charged by the county for off-site road improvements vary depending upon the road sphere in which the project is located. The fees range from $140 to $870 per unit in the western portion of the county, and up to $1,700 in eastern Nevada County. All roads constructed on-site must be built to county standards.

Sewer and Water. The county requires proof that residential lots can be served either by connecting to established sewer and water districts or by providing

wells and septic tanks on-site. Typically, the county will require test wells to be drilled for water and percolation and mantle tests to be performed for septic tanks. The county also charges per-lot fees of $350 for a septic system permit and $175 for a well permit. These requirements are reasonable given the topographic and geologic conditions in the county.

If the development connects to established water and sewer systems, then per-lot capacity and connection fees are charged by the utility districts. For treated water service, the Nevada Irrigation District charges $480 for a 5/8-inch water for each lot within a developed subdivision. For properties that are not already developed, the charge is $2,230 per lot. The difference of $1,750 per lot is a capacity fee. In the eastern county, water service charges are comparable. The Truckee-Donner Public Utility District typically charges $450 per lot for a meter and $1,330 for a facility (capacity) fee. In the case of both districts, additional costs can be incurred depending on the pressure zone in which the project is located and whether a road crossing will be required.

Sewer system costs are similar to those charged for water service. The Truckee Sanitary District and Truckee Tahoe Sanitation Agency assess a combined $3,675 fee per lot for single-family units. The fees charged for multi-family development vary depending on the project and are higher than those charged for single-family development. A $250 plan check fee is charged regardless of the project and combined connection charges are $3,500 per unit.

Schools. Pursuant to 1986 legislation (AB 2926) and 1992 legislation (SB 1287) school districts can directly levy developer fees to defray the costs of accommodating new students. These fees currently are $2.65 per square foot for new residential construction.

Fees and Exactions

The building permit and other fees charged by the county vary depending on the location of the site and the extent of construction required. For example, fire district and road fees will vary depending on the district or sphere in which the project is located. Also, additional fees will charged to a project if site grading or driveway construction is required. Table 7.5 summarizes average fees for a single-family house of 1,000 square feet with a garage and a 100-foot driveway.

According to the state Department of Housing and Community Development, local jurisdictions throughout the state have tended to increase the burden of fees placed on new housing to finance infrastructure, primarily as a result of property tax reductions brought about by Proposition 13. The Department now assumes that fees comprise as much as 10 percent of the cost of a new home. Since most fees are levied on a per-unit basis, it is economically advantageous to a developer to build more expensive homes. Also fees become an even larger portion of the total cost of lower-cost homes.

In comparison to adjacent jurisdictions, the fees charged by the county appear to be reasonable. For example, in Placer County a building permit for a home of 1,000 square feet and a garage would be $609. A building permit for a similar dwelling within the city of Auburn would cost $898 (City of Auburn General Plan (draft), 1992). As shown in Table 7.6, a building permit for the same home in Nevada County would be $689, an amount in between the permit costs for Placer County and

Table 7.5
FEES APPLICABLE TO RESIDENTIAL CONSTRUCTION
1993

Fee Category	Amount
Building Permit Fee[1]	$689
Driveway Permit	111
Grading Permit	200
School District[2]	1,590
Road Fee[3]	505
Fire District Fee[4]	500
Septic System	350
Well permit	175
Total	$4,118

Notes: [1] Includes plan check and inspections. For second dwellings, add conditional use fee of $1,017. Multi-family dwellings add an average site plan review fee of $2,298. Multi-family building permit fees will vary.
[2] Fee is calculated at $2.65 per square foot.
[3] Fees vary from $140 to $870 in the western county.
[4] Fees vary from $0.27 to $0.73 per square foot.
Source: Nevada County Planning Department, 1993.

the city of Auburn. In total, the fees charged by the county for the hypothetical 1,000 square foot home would equal slightly more than $4,100. According to Grass Valley's Housing element, the city was charging approximately $4,500 per lot for residential subdivisions as of 1986. Again, the fees charged by the county appear to be in line with those charged by neighboring jurisdictions.

Processing and Permit Procedures

According to the state Department of Housing and Community Development, the approval of a typical residential building permit application for new construction takes approximately 12 to 24 months. Delays in processing can add to a developer's holding and overhead costs, particularly when interest rates are high. The Department has estimated that delays in project approval can add as much as $5,000 to $10,000 to the cost of each housing unit.

For this report, a variety of project files from the Nevada County Planning Department were examined to determine the representative times required for processing permits (See Table 7.6). As expected, the length of time required for permit approval was highly related to the complexity of the project and, in particular, to the extent of environmental review. A straightforward residential building permit can be processed in as little as three days in winter, although the process can take as long as two weeks during the busier summer construction season. The time required to process conditional use permits for different types of housing ranged from slightly more than one month to four months. Large subdivisions required the longest approval period. An estimate of the time required for most large subdivisions was one to one and one-half years. This range fell within the one to two year period cited

by the Department of Housing and Community Development as typical for California. Given the recent incorporation of Truckee, there are no data on the times needed for processing residential permits within the Town.

Table 7.6
REPRESENTATIVE APPROVAL TIMES FOR RESIDENTIAL PERMITS
1992

Type of Permit	Approval Time
Residential Building Permits	3 days (winter) 14 days (summer)
Ministerial Site Plan	
Administrative - no public hearing; normally four units or less.	5 weeks
Discretionary - public hearing; more than four units.	
Conditional Use Permits	
Senior Citizen Housing; one unit.	5 weeks
Senior Citizen Housing; more than one unit.	12 weeks
Mobilehome Parks	12 to 16 weeks
Tentative Parcel Map	
Land Subdivision; up to four parcels	5 weeks
Tentative Final Map	
Land Subdivision; five or more parcels	16 weeks to 4 years
Source: Nevada County Planning Department, 1992.	

Appendix A Report Preparation Resources

Persons and Organizations Contacted

Public and Private Agencies

Nevada County Building Department	Jean Cheli
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Nevada County Planning Department	Sharon Boivin
	Stephanie Wagner
Nevada County Housing Development Corporation	Cindy Hermitt
State of California Department of Finance	Terry McRae
State of California Employment Development Department	Linda Rodgers
State of California Community Development Department	Linda Wheaton
U.S. Department of Housing and Urban Development	Rita Phillips
Alta California Regional Center	Mike Alward
FREED/Independent Living Center	Sam Dardick
Community Spirit	Tom Bookbinder
Project Go, Inc.	Lynda J. Timbers
Rural California Housing Corporation	Stanley Keasling
Salvation Army	Captain Soltz
United Way	Jan Bray

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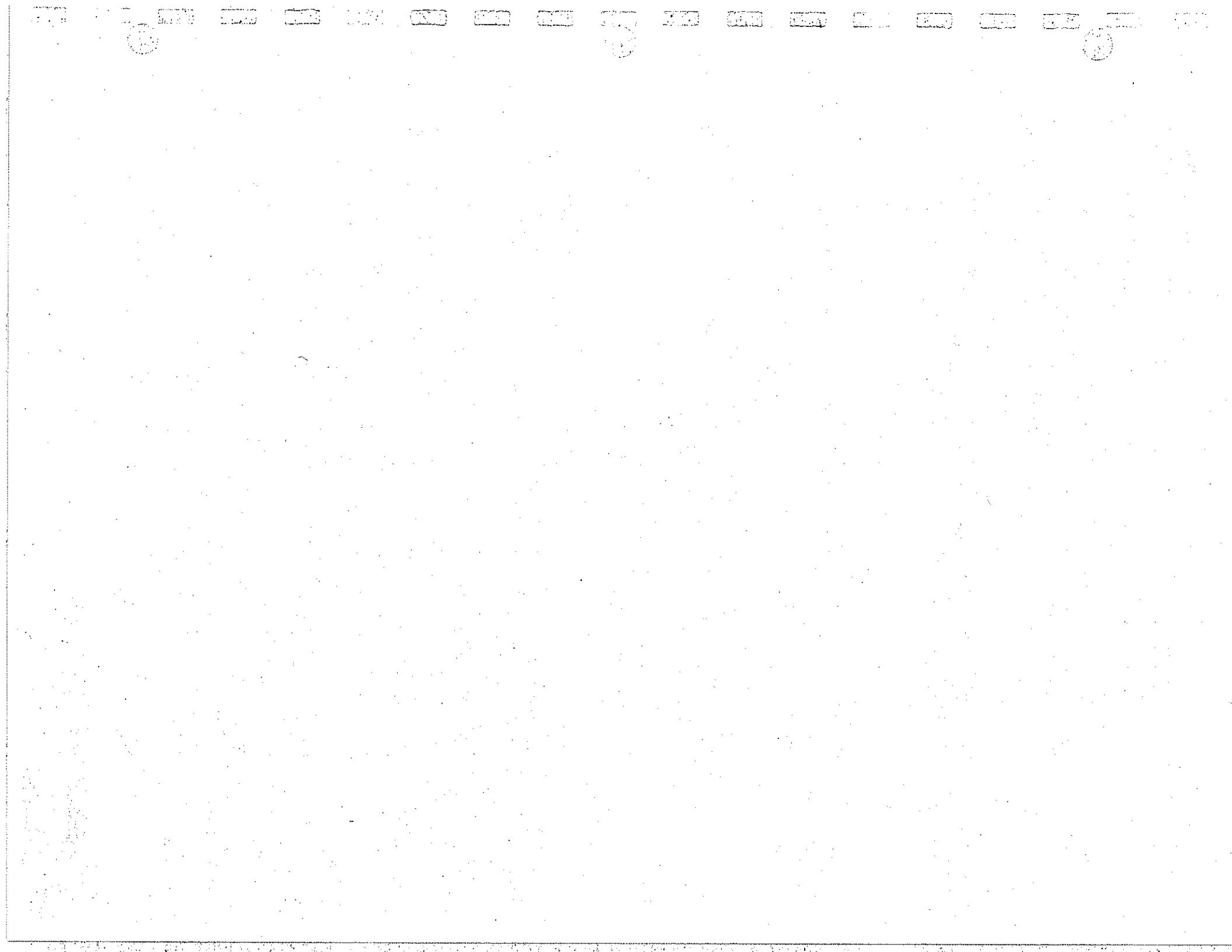
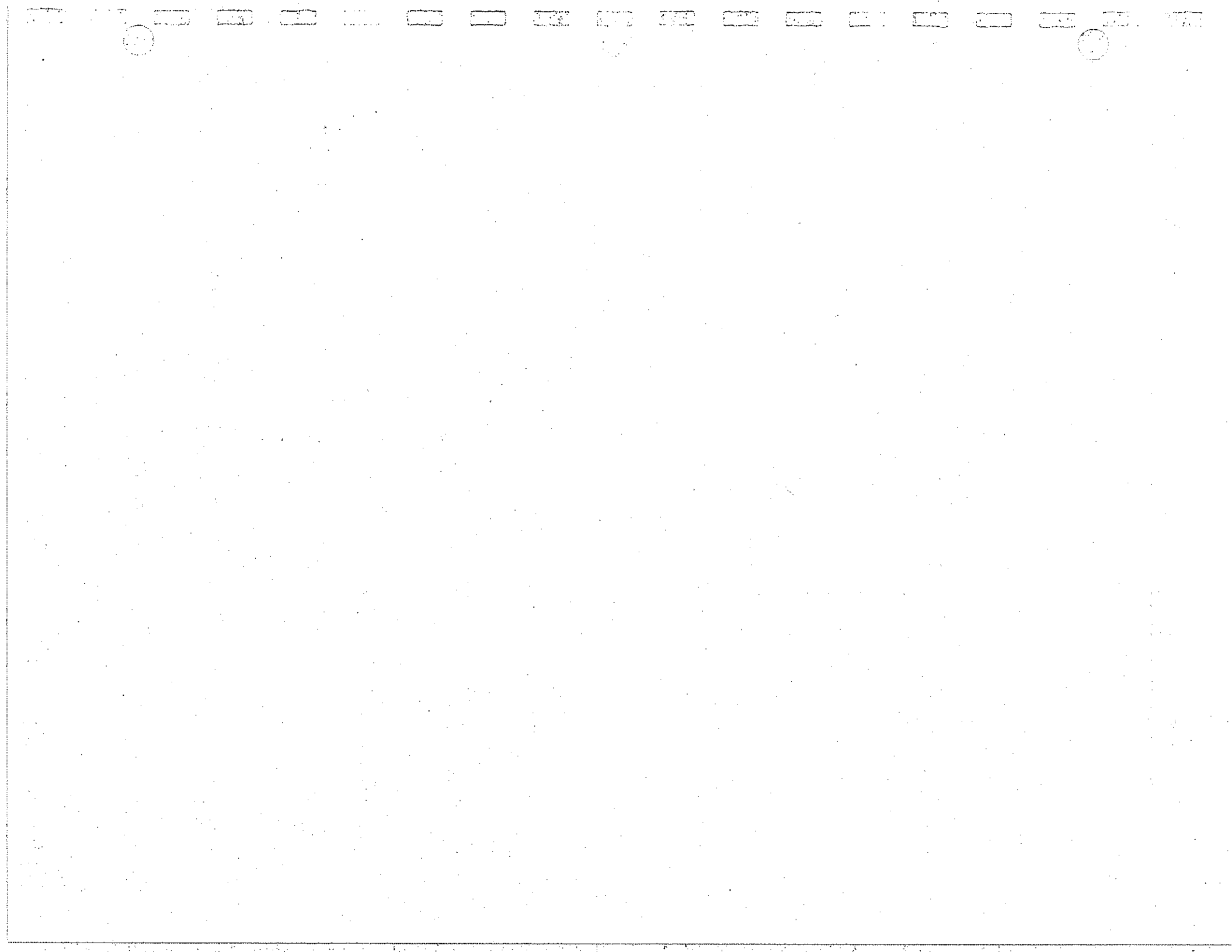


Nevada County General Plan

Volume 2: Background Data and Analysis

Section 3: Noise Analysis



Noise Analysis

Introduction

The purpose of the Noise Analysis is to provide guidance in the preparation of the General Plan, particularly the location of noise sensitive land uses, so that conflicts between noise generators and the noise sensitive uses can be prevented or reduced. To accomplish this, the noise environment should be identified and quantified through data reflecting the relative level of noise impact. Potentially significant noise sources include traffic on major roadways and highways, railroad operations, as well as industrial activities and other fixed noise sources.

The noise environment in Nevada County was established based upon extensive file data collected by the Nevada County Planning Department and project related data collected by Brown-Buntin Associates, Inc. This data, along with noise modeling for transportation sources, was used to describe existing noise levels in noise-sensitive areas within Nevada County so that policies and noise level performance standards could be developed to maintain an acceptable noise environment.

Because modeling of future noise levels requires projections of future operating data as a base, it is only practical where future operating conditions can be established, such as roadways, based upon future traffic volumes, or airports, based on future flight operations. Modeling or projection of future noise data is not practical for fixed noise sources in the County for example, due to the lack of availability of data on future operations. In such cases, data from existing operations provides the best available guide as to potential impacts from noise in the future.

Noise modeling techniques use source-specific data including average levels of activity, hours of operation, seasonal fluctuations, and average levels of noise from source operations. Modeling methods have been developed for a number of environmental noise sources including roadways, railroad line operations, railroad yard operations, industrial plants and airports. Such methods produce reliable results as long as data inputs and assumptions are valid. The modeling methods used in this report closely follow recommendations made by the State Office of Noise Control, and were supplemented where appropriate by field-measured noise level data to account for local conditions. The noise exposure contours are based upon annual average conditions. The resulting contours provide guidance in land use planning for the General Plan, but because local topography, vegetation or intervening structures may significantly affect noise exposure at a particular location, the noise contours should not be considered site-specific.

The following sections identify and analyze the existing noise environment, and where feasible, present projected noise conditions. The information from this analysis was used in developing the policies and implementation measures in Volume

1 of the General Plan, and in determining the appropriate land use General Plan Land Use Maps.

Roadways

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to develop L_{dn} contours for all highways and major roadways in Nevada County. The FHWA Model is the analytical method presently favored for traffic noise prediction by most state and local agencies, including Caltrans. The current version of the model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour day and to adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Traffic data representing annual average traffic volumes for existing conditions were obtained from Caltrans and Harland Bartholomew and Associates . Day/night traffic distribution and truck mix were based upon Caltrans and BBA file data. Using these data and the FHWA methodology, traffic noise levels as defined by L_{dn} were calculated for existing (1990) traffic volumes and for projected volumes based upon buildout of the General Plan. Distances from the centerline of selected roadways to the 60 and 65 dB L_{dn} contours are summarized in Table I for existing conditions, and in Table II for buildout conditions. The tabular format was chosen to present contour data as the most useful way of showing the data for planning purposes. The distance from centerline of the roadway to the outer limit of the contour can thus be readily applied to a variety of maps and map scales.

These calculations do not include consideration of shielding caused by local buildings or topographical features, so the distances reported in Table I are worst-case estimates of noise exposure along roadways in the community.

Noise contours were developed for representative roadways within the major roadway network defined in the Nevada County Road Functional Classification Plan, including roadways from each of the different functional classifications. Development of noise contour data for each segment of the several hundred miles of roadways in the total system is not practicable, particularly given the rural character and low traffic volume of many of the roadways, but the selected roadways are intended to be representative of the impact of roadway noise, and useable for preparation of the General Plan.

Table I - Noise Contour Data Distance (feet) From Center of Roadway To L_{dn} Contour			
Segment	Description	1990	
		60 dB	65 dB
SR 49:			
1	@ Placer County Line	329	153
2	South of Combie Road	343	159
3	South of Allison Ranch Road	284	132
4	North of McKnight Way	435	202
5	North of Newton Road	110	51
SR 20:			
6	@ Yuba County Line	122	57
7	West of Rough and Ready	158	74
8	West of SR 49	194	90
9	North of Empire Street	339	157
10	South of Idaho-Maryland	398	185
11	South of Brunswick	382	177
12	North of Gold Flat	304	141
13	North of Broad Street	204	95
14	North of Nevada Street	99	46
SR 89:			
15	South of I-80	265	123
16	North of I-80	108	50
SR 267:			
17	South of Commercial Row	198	92
18	South of River Street	166	77
19	I-80 to Bridge Street	227	105
NEVADA CITY HIGHWAY:			
20	South of Banner Lava Cap	134	62
21	South of Ridge Road	139	65
PLEASANT VALLEY ROAD:			
22	North of SR 20	176	82
23	South of Mooney Flat Road	110	51
PENN VALLEY ROAD:			
24	South of SR 20	87	40
25	South of SR 20/Rough & Ready	108	50
ROUGH & READY HIGHWAY:			
26	North of SR 20	77	36
27	East of Bitney Springs Road	129	60
BRUNSWICK ROAD:			
28	East of Nevada City Highway	246	114
29	East of Sutton Way	281	131
30	North of Idaho-Maryland	179	83
31	North of Bennett Road	168	78
32	South of Bennett Road	145	67
34	West of Brunswick Road	182	84
IDAHO-MARYLAND ROAD:			
35	East of Main Street	166	77

Table I - Noise Contour Data Distance (feet) From Center of Roadway To L_{dn} Contour			
Segment	Description	1990	
		60 dB	65 dB
36	East of Railroad Avenue	160	74
37	East of Dorsey	99	46
38	South of SR 20	53	24
BENNETT ROAD:			
39	East of Ophir	53	24
40	West of Brunswick	44	20
SR 174 COLFAX HIGHWAY:			
41	East of Empire	117	54
42	South of Brunswick	153	71
43	East of SR 20	140	65
LA BARR MEADOWS ROAD:			
44	South of McKnight	161	75
45	North of Dog Bar Road	137	63
COMBIE ROAD:			
46	East of SR 49	177	82
47	South of Magnolia	107	49
MAGNOLIA ROAD:			
48	North Combie Road	173	80
49	West of Dog Bar Road	31	14
RIDGE ROAD:			
50	East of Rough & Ready	101	47
51	East of Hughes Road	153	71
52	West of Zion Street	102	47
I-80:			
53	Entire Length	558	259

Table II - Noise Contour Data Distance (feet) From Center of Roadway To L_{dn} Contour			
Segment	Description	Plan Buildout	
		60 dB	65 dB
SR 49:			
1	@ Placer County Line	535	248
2	South of Combie Road	535	248
3	South of Allison Ranch Road	442	205
4	North of McKnight Way	692	321
5	North of Newton Road	124	58
SR 20:			
6	@ Yuba County Line	235	109
7	West of Rough and Ready	254	118
8	West of SR 49	389	180
9	North of Empire Street	582	270
10	South of Idaho-Maryland	582	270

Table II - Noise Contour Data Distance (feet) From Center of Roadway To L_{dn} Contour			
Segment	Description	Plan Buildout	
		60 dB	65 dB
11	South of Brunswick	487	226
12	North of Gold Flat	472	219
13	North of Broad Street	284	132
14	North of Nevada Street	209	97
SR 89:			
15	South of I-80	327	152
16	North of I-80	161	75
SR 267:			
17	South of Commercial Row	329	153
18	South of River Street	329	153
19	I-80 to Bridge Street	274	127
NEVADA CITY HIGHWAY:			
20	South of Banner Lava Cap	183	85
21	South of Ridge Road	150	70
PLEASANT VALLEY ROAD:			
22	North of SR 20	251	117
23	South of Mooney Flat Road	173	80
PENN VALLEY ROAD:			
24	South of SR 20	114	53
25	South of SR 20/Rough & Ready	155	72
ROUGH & READY HIGHWAY:			
26	North of SR 20	99	46
27	East of Bitney Springs Road	182	84
BRUNSWICK ROAD:			
28	East of Nevada City Highway	220	102
29	East of Sutton Way	220	102
30	North of Idaho-Maryland	225	104
31	North of Bennett Road	225	104
32	South of Bennett Road	110	51
SUTTON WAY:			
33	East of Brunswick Road	149	69
34	West of Brunswick Road	149	69
IDAHO-MARYLAND ROAD:			
35	East of Main Street	178	83
36	East of Railroad Avenue	176	82
37	East of Dorsey	117	54
38	South of SR 20	39	18
BENNETT ROAD:			
39	East of Ophir	160	74
40	West of Brunswick	115	53
SR 174 COLFAX HIGHWAY:			
41	East of Empire	148	69
42	South of Brunswick	140	65
43	East of SR 20	140	65

Table II - Noise Contour Data Distance (feet) From Center of Roadway To L_{dn} Contour			
Segment	Description	Plan Buildout	
		60 dB	65 dB
LA BARR MEADOWS ROAD:			
44	South of McKnight	266	123
45	North of Dog Bar Road	174	81
COMBIE ROAD:			
46	East of SR 49	242	113
47	South of Magnolia	242	113
MAGNOLIA ROAD:			
48	North Combie Road	194	90
49	West of Dog Bar Road	37	17
RIDGE ROAD:			
50	East of Rough & Ready	145	67
51	East of Hughes Road	217	101
52	West of Zion Street	117	54
I-80:			
53	Entire Length	1,036	481

Railroads

Railroad activity in Nevada County includes freight activity on the Southern Pacific Transportation Company (SPTCo) trackage which travels east/west through the eastern portion of the County and through the town of Truckee.

Continuous noise measurements were conducted by BBA on June 13-14, 1990 for a 24-hour period approximately 75 feet from the centerline of the SPRR railroad track centerline near the Placer/Nevada County Line. These measurements were conducted in conjunction with a noise study for the Sugar Bowl Ski Resort. The measurement system was programmed to collect individual sound exposure levels (SEL) associated with individual SPTCo operations. In the project vicinity, locomotive noise, warning horn noise, and roadway crossing bells were the major contributors to railroad noise levels as defined by SEL. The results of the noise measurements indicate an average SEL of 101.9 dB at a distance of 75 feet.

Railroad operational data were obtained from the Roseville office of the Southern Pacific Railroad to determine existing rail operations. Present operations on this line include an average of 6 freight trains per day traveling in each direction, all on an unscheduled basis. SPTCo staff indicated that freight trains are randomly distributed throughout the daytime and nighttime hours. One Amtrak operation occurs during the early afternoon hours in each direction. There were no estimates of future train traffic operations available.

To relate railroad operational data to an L_{dn} standard, it is necessary to calculate the L_{dn} for typical freight and passenger operations. This is done using the SEL values and the above-described number and distribution of daily train operations. The L_{dn} contribution of each train type may be calculated as follows:

$L_{dn} = SEL + 10 \log N_{eq} - 49.4$ dB, where:

SEL is the mean SEL of the event, N_{eq} is the sum of the number of daytime events (7 a.m. to 10 p.m.) per day plus ten times the number of nighttime events (10 p.m. to 7 a.m.) per day, and 49.4 is 10 log the number of seconds per day. The total L_{dn} of railroad operations is the sum of the L_{dn} contributions of each train type, based upon annual average conditions. Based upon the above-described noise level data and methods of calculation, the L_{dn} at a distance of 75 feet from the tracks was determined to be 67.6 dB. The distance to the 60 dB L_{dn} noise contour is 240 feet from the track centerline. (Due to the available scale of mapping at 1"=5000', the mapping of this contour is not practical.) Because no projections of future operations are available, future noise contours cannot be determined.

Airport Noise Sources

There are two public use airports located in Nevada County. CNEL contours are shown to describe existing operations at each of the airports. The contours shown in the Noise Element are based upon Master Plans which have recently been prepared for each of the facilities. The following section describes the location and nature of each airport.

Nevada County Airpark

The Nevada County Airpark is located east of Grass Valley. The facility is a base for local personal and recreational flyers. The Nevada County Airpark also serves as a transportation facility for business/corporate aviation and aerial fire-fighting operations. Based upon the July 1990 Nevada County Airpark Master Plan prepared by Hodges and Shutt, there are 160 based aircraft with 75,000 operations per year. Future upgrades of the facility are recommended in the Master Plan, and the 20-year forecast projects an increase in operations to 116,000 per year. Figure 1 shows the existing CNEL contours for the Nevada County Airpark which are contained in the Master Plan.

Truckee-Tahoe Airport Master Plan

The Truckee-Tahoe Airport is located off of SR 267, south of Truckee, California. The facility is a general aviation airport which primarily serves as a base for local personal and recreational air traffic. Currently, there is no scheduled airline service to the Truckee-Tahoe Airport. It is anticipated that airline service may commence based upon potential growth of the area. Based upon the December 1988 Truckee-Tahoe Airport Master Plan prepared by Raymond Vail and Associates, there are approximately 132 based aircraft with approximately 33,000 operations per year. Future aviation demand forecasts project approximately 83,800 operations per year in the year 2010. The aviation demand forecast for the year 2010 include 12,000 commuter/air taxi and charter operations. Figure 2 shows the existing CNEL contours for the Truckee-Tahoe Airport which were prepared by Brown-Buntin Associates for the 1988 Master Plan.

Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational and public service facility activities can also produce noise which affects adjacent sensitive land uses.

From a land use planning perspective, fixed-source noise control issues focus upon two goals: to prevent the introduction of new noise-producing uses in noise-sensitive areas, and to prevent encroachment of noise sensitive uses upon existing noise-producing facilities. The first goal can be achieved by applying noise performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in proximity to noise-producing facilities include mitigation measures to ensure compliance with noise performance standards.

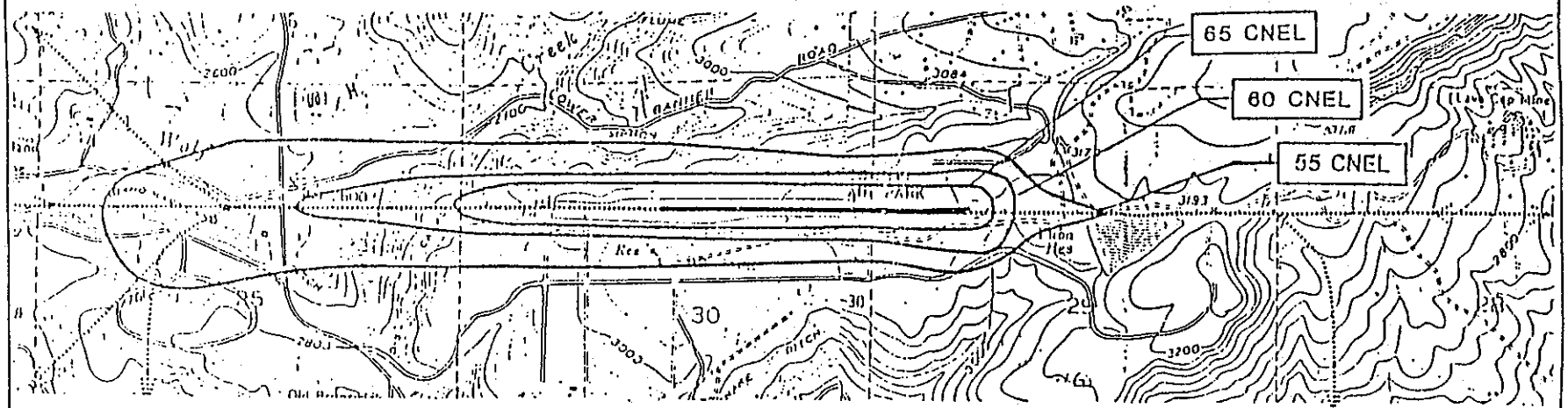
The following descriptions of existing fixed noise sources in the Nevada County study area are intended to be representative of the relative noise impacts of such uses, and to identify specific noise sources which should be considered in the review of development proposals. Although much of the data was collected prior to 1988, the County has conducted limited field monitoring since 1988, and the pre-1988 data is still representative of the noise environment in the County.

Light Industrial Areas

Numerous light industrial areas exist in Nevada County. Based upon noise level measurements conducted by the Nevada County Planning Department staff for the 1986 General Plan Noise Element and updated in May of 1993, most of the light industrial areas have very little noise associated with their operations. High noise levels observed in the vicinity of these operations were noted as being due to roadway traffic. The following Table III is a list of light industrial facilities and noise level data collected by the Nevada County Planning Department staff in the near vicinity of each operation.

FIGURE 1

NEVADA COUNTY AIRPARK
1989 CNEL CONTOURS



Source: Nevada County Airpark Master Plan
July 1990

BBA

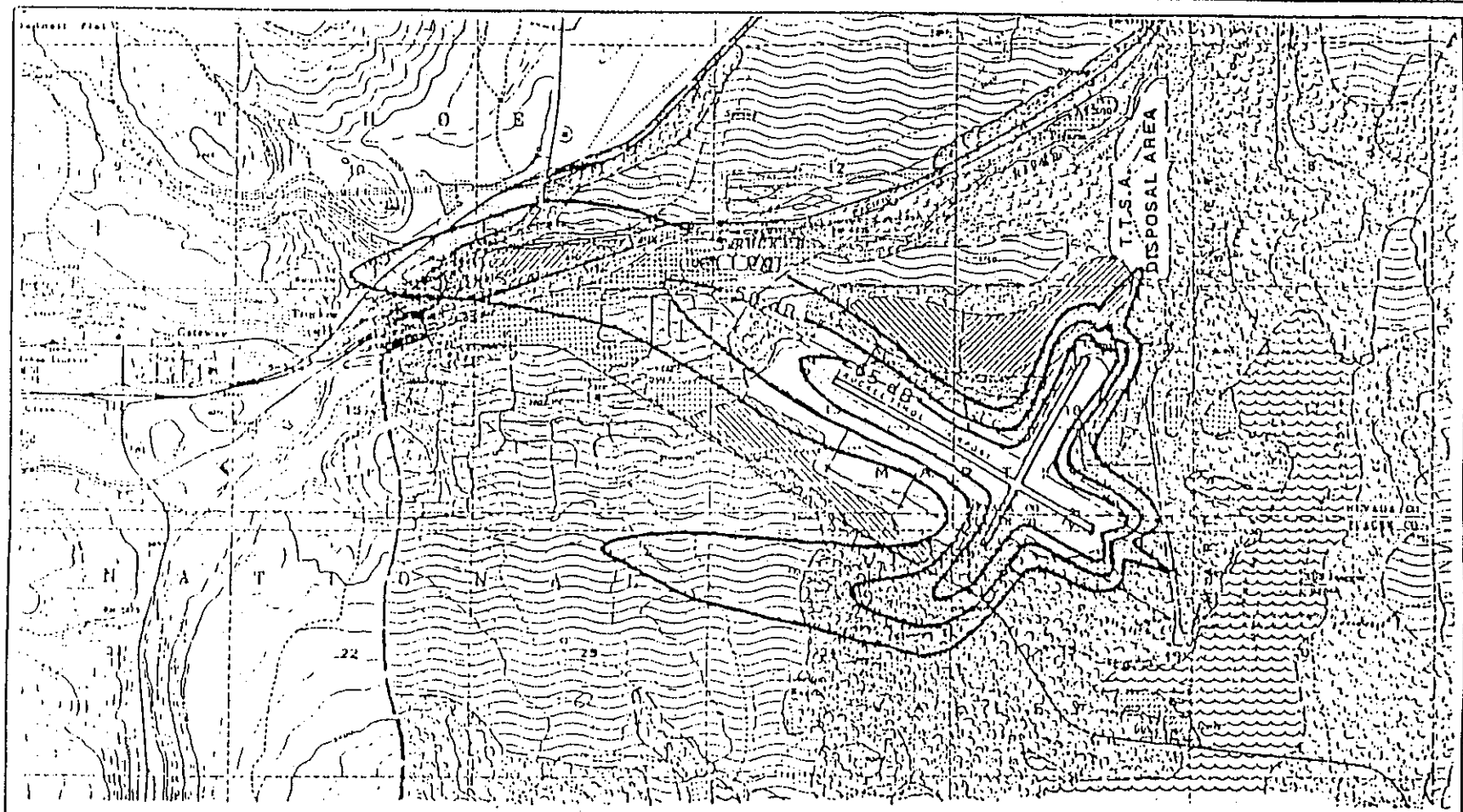


FIGURE 2 — TRUCKEE-TAHOE AIRPORT 1988 CNEL CONTOURS

BBA

Table III
NEVADA COUNTY LIGHT INDUSTRY NOISE LEVEL DATA
(Collected by Nevada County Staff)

Site	L_{eq}	L_{max}	Time	Date	Location
Loma Rica Industrial Pk.	38.0 46.0	76.0 83.0	7pm-7am 7am-7pm	March 1985	Grass Valley Ave./ Charles Drive
	54.9	73.8	10:30am - 10:40am	May 1993	
La Barr Meadows Industrial	39.0 38.0 32.0	69.0 72.0 64.0	8am-9am 9am-10am 10am-11am	April 1985	500' N. of Industrial Area
	53.2	60.8	12:00am 12:10am	May 1993	
Grass Valley Group	48.2	73.1	9:10am - 9:30am	June 1985	Bitney Springs Rd
	47.4	69.3	11:40am - 11:50am	May 1993	
Kingston Ln. R&D Facility	43.3	61.6	9:10am - 9:30am	June 1985	On Kingston Ln. between Magnolia School and R&D Facility
	44.6	64.7	2:25pm - 2:35pm	May 1993	
Streeter Rd. Industrial Area	52.8	69.7	10:20am- 10:40am	June 1985	On Streeter Road
	50.1	60.6	1:25pm - 1:35pm	May 1993	
West River St. Industrial Area (ABC Concrete Product)	65.4	84.6	4:55pm - 5:10pm	June 1985	East of Highway 89

The surveys were taken during normal working hours and represent typical levels of noise for such facilities. The types of facilities discussed above, most of which are light industrial uses, may not have industrial operations which produce excessive noise levels at the monitoring locations. However, these types of facilities will generally have HVAC systems, evaporative coolers, outdoor public address systems and associated delivery truck traffic which may produce noise levels considered obtrusive to nearby noise sensitive land uses. These sources may be directional in nature or may occur intermittently throughout the day.

Lumbermills

Lumbermills are distributed throughout Nevada County, and are considered to be potentially significant stationary noise sources. Noise generating equipment associated with lumbermills includes the operation of saws, planers, blowers, dry kilns and fork-lifts. BBA file data on lumbermill operations indicate that noise levels

of approximately 65 dB L_{eq} and 71 dB L_{max} could be expected at a distance of 400 feet.

The Nevada County Planning Department staff collected lumbermill noise level data for the 1986 General Plan Noise Element and updated this data in May of 1993. Table IV summarizes the noise level data collected by the planning staff.

Table IV
NEVADA COUNTY LUMBERMILL NOISE LEVEL DATA
(Collected by Nevada County Staff)

Lumber Mill	L_{eq}	L_{max}	Time	Date	Location
Agate Sales*	59.0 56.0 49.0	82.0 77.0 82.0	1pm-2pm 2pm-3pm 3pm-4pm	April 1985	On Bennett St. 300' from mill
	52.6	79.7	12:25pm - 12:35pm	May 1993	
Bohemia Mill*	73.0 74.0 49.2 63.0	89.0 86.0 66.4 82.4	11am-12pm 12pm-1am 2pm-2:35pm 10pm-10:20pm	April 1985 July 1985 July 1985	Near Brunswick Road 300' from mill 1000' West of mill Near Brunswick Road 300' from mill
	55.7	72.5	12:00pm - 12:10pm	May 1993	
Warnke Mill	63.0 63.0	82.0 81.0	2pm-3pm 3pm-4pm	April 1985	North of Idaho-Maryland Rd. 300' from mill saw & loader
	58.2	79.9	12:55pm - 1:05pm	May 1993	
Caffey-Rice Mill *	50.0 50.0	78.0 73.0	Mill not in operation Mill not in operation		
	51.1	74.3	1:20pm - 1:30pm	May 1993	
Louisiana Pacific Mill	55.6	69.7	8:40pm-9pm	July 1985	400' North of mill and South of Hwy 89

* Mill not currently in operation.

In general, the noise level data collected by BBA correlate well with the data collected by the Nevada County Planning Department staff. Each mill may vary in types of operations and operational size. In addition to the Caffey-Rice Mill, which was not in operation during the time noise level measurements were conducted, the Bohemia and Louisiana Pacific mills are not currently in operation, and it is not known when they may reopen. Also, some may operate only on a periodic basis.

Mining Operations

Mining operations are scattered throughout Nevada County. These operations include the mining of rock, sand/gravel, gold and barite. Many of these operations are inactive or operate intermittently. Some of these operations are located in extremely

remote areas and are removed from residences which could be disturbed by mining operation noise. The 1993 status of mining operations is shown below.

Two additional mining operations have received approvals from Nevada County. These are the Ridgerock sand and gravel quarry located near Birchville, and the Clauson Mine.

TABLE V
MINING OPERATIONS IN NEVADA COUNTY 1993

Name	Location	Type	Status
Cal Sierra	Allison Ranch Rd.	Rock	Inactive
Joe Chevreaux	Bear River	Sand/Gravel	Seasonal
Val Metal	Grizzley Hill Rd.	Gold/Gravel	Inactive/Intermittent
Bill Dearman	Hirschdale Road	Gold	Inactive
Kelmine Corp.	Meadow Lake	Gold	Inactive
Teichert & Sons	Martis Valley	Sand/Gravel	Seasonal
Placer Services	San Juan Ridge	Gold	Inactive
Hansen Brothers	Greenhorn Creek	Sand/Gravel	Seasonal
Hansen Brothers	Bear River	Sand	Inactive
Upper Spanish	N. of Washington	Barite	Seasonal
Mine	U-Bet Diggins	Gold	Inactive
Grant Exploration	Idaho-Maryland Rd.	Rock	Active/Intermittent
Northstar Rock	Lowell Hill Road	Barite	Inactive
Cal Bar	Birchville	Gold	Inactive
International Res	Pleasant Valley Rd.	Gold	Active/Intermittent
French Corrall	Tyler Foote Road	Gold	Active
San Juan Gold	Glenshire	Rock	Active
Sha-Neva	Hirschdale Road	Cinder/Gravel	Active
West River Cinder	Pleasant Valley Rd.	Rock	Active
Ridgerock Quarry			

Mining operations generally consist of harvesting material, crushing and screening of the material, heavy machinery moving material on the site, and the transport of the material in heavy trucks.

BBA file data on mining operations indicate that maximum noise levels from heavy equipment operating on site range from 82 to 87 dB at a distance of 50 feet. Material processing operations which include the use of aggregate screens, jaw crushers and cone crushers have maximum noise levels of 83 to 87 dB at a distance of 50 feet. Material harvesting generally consists of drilling into rock formations where explosive charges are placed, blasting the large formations of rock and then moving the material with heavy equipment.

Drilling rig noise levels generally range between 80 and 90 dB at a distance of 50 feet and occur periodically. Blasting noise levels vary depending on the size of the charge, time delay for multiple charges, and depth at which the explosive charge is set. Noise levels from explosive charges are generally expressed in terms of "peak air overpressure." They are measured with a sound level meter set to the "peak" response setting, with linear frequency response. Peak levels from blasting are instantaneous in nature, with the majority of sound energy occurring at very low frequencies. The typical L_{max} noise level standard used by most jurisdictions to evaluate single event noise levels does not correlate well with blasting noise. L_{max} standards are generally

expressed in terms of "A-weighted" sound pressure levels, which account for how the human ear perceives a sound, discounting low frequency sound. An L_{max} sound level is the root-mean-square of the instantaneous sound pressure level, and is lower than the peak level for impulsive sounds. Limited BBA file data indicate that A-weighted L_{max} sound levels produced by blasting are about 36 to 38 dB lower than peak linear overpressures.

Determining a typical hourly L_{eq} value for a typical mining operation is difficult based upon variations in the size of an operation, type of equipment used, the effects of shielding from local topography, presence of drilling equipment, blasting information and general mitigation measures which may be contained in the harvest plan.

Information regarding the proposed **Ridgerock Quarry** near Birchville in Nevada County indicates that an hourly L_{eq} value during typical operations would be approximately 85.8 dB at a distance of 50 feet, and an hourly L_{eq} of approximately 60 dB at 1,000 feet, without the benefit of shielding from local topography. In contrast, the **Teichert** Martis Valley mining operation is estimated to have an average hourly L_{eq} value of 90.4 dB at a distance of 50 feet, and an hourly L_{eq} of approximately 64 dB at 1,000 feet without the benefit of shielding from local topography. The differences in noise levels indicates that the Teichert operation produces 3 times the sound energy of the proposed Ridgerock Quarry operation.

The Nevada County Planning Department staff obtained noise level readings of existing mining operations while in operation. These data are reported below:

TABLE VI
NEVADA COUNTY MINING OPERATIONS NOISE LEVEL DATA
(Collected by Nevada County Staff)

Name	L_{eq}	L_{max}	Time	Date	Location
Hansen Brothers/ Greenhorn Creek	62.0	75.0	7am-7pm	April 1985	600' south of operation
Joe Chevreaux/ Bear Creek	61.0	76.0	11:30am-11:50am	June 1985	Unknown
Cal Sierra/ Allison Ranch Rd.*	52.0	78.0	10:40am-11:00am	June 1985	Unknown
	59.4	65.6	5 minutes	Jan. 1986	100 yds @ E. Property Line
	51.9	62.4	5 minutes	Jan. 1986	200 yds @ S.E. Property Line
	49.8	64.3	5 minutes	Jan. 1986	400 yds @ W. Property Line

TABLE VI
NEVADA COUNTY MINING OPERATIONS NOISE LEVEL DATA
(Collected by Nevada County Staff)

Name	L_{eq}	L_{max}	Time	Date	Location
San Juan Gold/ Tyler Foote Rd.*	67.7	70.2	Unknown	Nov. 1985	150' from Rock Drill
	56.9	61.5			
	60.4	61.3			
	58.9	64.0			
	82.5	87.3	11:45am-11:48am	Dec. 1988	32' W. of Rock Drill
	57.9	60.3	11:55am-11:58am	Dec. 1988	200' W. of Rock Drill
	74.0	80.4	11:30am-11:37am	Dec. 1988	50' S.E. of Rock Drill
	80.4	83.4	11:22am-11:27am	Dec. 1988	50' N of Rock Drill
Sha-Neva/ Glenshire	52.4	70.1	3:20pm-3:33pm	June 1985	In Residential Area Near Rock Plant
West River Cinder/ Hirschdale Rd.	53.7	72.8	3:45pm-4:00pm	June 1985	Off Hirschdale Road
French Corral/ Pleasant Valley Rd	65.1	75.4	2:58pm - 3:03pm	July 1990	300' north of operation
Ridge Rock Quarry/ Pleasant Valley Rd**	52.7	71.5	NA	May 1990	50' southwest of access road entrance
Northstar Quarry Idaho/Maryland Rd	70.7	77.0	7:00am - 7:00pm	May 1992	200' south of operation

* Not currently in operation
** Consultant estimate

The multiple activities which occur at a mining operation may not occur continuously during any given hour. In the case of a small mining operation, load out activities or wheel loader operations may only occur for a period of 20 or 30 minutes during an hour. Also, the various operations may not occur simultaneously. Therefore, the noise level data shown above, which may represent only 5-20 minutes of an hour, would not reflect actual hourly L_{eq} values associated with each of the mining operations.

Shooting Ranges

The Nevada County Sportmen's Club is located on Banner Mountain Trail. This is a facility open to the public, providing target practice using pistols and large bore rifles. The facility also has a trap shooting facility. Noise level data indicate that

a .357 magnum pistol registers a maximum noise level of 112 dB at a distance of 50 feet. A 7 mm magnum rifle registers approximately 111 dB at a distance of 50 feet. A 12 gauge shotgun registers 97 dB at a distance of 50 feet.

Noise level measurements conducted by the Nevada County Department of Planning staff in the vicinity of the Nevada County Sportmen's Club indicated that maximum noise levels ranged between 86.0 - 95.8 dB on Rocker Way, 60.3 - 71.9 dB on Caledonia Way and 60.4 - 69.2 dB on Melanie Court. The wide range of measured maximum noise levels is due to the type, number and caliber of guns being fired at the facility.

Dog Kennels

Dog kennels and animal control shelters can be considered as an objectionable source of noise if located near noise sensitive land uses. The primary noise source associated with kennels is barking dogs.

A consultant report was prepared for Nevada County at the Horton Street Kennel which is operated by Larry and Sandra Self. The report indicated that maximum noise levels from barking dogs was approximately 78.1 dB at a distance of 100 feet. The measured L_{eq} value for a 1-2 minute sample period was approximately 63.2 dB at 100 feet.

BBA file data for the Sacramento County Animal Control Shelter indicated that average noise levels ranged between 80.5 and 66.2 dB at distances of 30 to 100 feet.

Race Track

The Nevada County Fair Grounds is located off of McCourtney Road southwest of Grass Valley. During the summer months, the Fair Grounds hold stock car races on Saturday nights. Time trials for the stock car races begin at 6:30 p.m., and races typically occur between the hours of 8:00 p.m. and 10:00 p.m. BBA file data for the Nevada County Fair Grounds race track and a report prepared by Land Use Associates in June, 1982 indicate that maximum noise levels range between 88 and 100 dB at a distance of 100 feet.

Transfer Station

The former Nevada County landfill site on McCourtney Road is now operated as a solid waste transfer facility. Measurements taken at E. Van Tam Way, 1000 feet north of the facility, by the Nevada County Planning Staff in May 1993 showed noise levels of 44.0 db L_{eq} and 71 db L_{max}.

Table VII
AMBIENT NOISE LEVELS
Based Upon Continuous 24-Hour Monitoring

Location	Date	Average Level, dB						
		7am-7pm		7pm-10pm		10pm-7am		
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{dn}
Quarry Site in Birchville	9/89	48.5	65.8	38.5	54.9	37.5	45.4	47.5
13032 La Barr Meadows Road	9/89	47.0	61.3	45.1	55.3	40.1	54.6	48.3
N. of SR 20 near Pleasant Valley Road	11/89	52.6	70.0	51.6	70.5	49.0	63.1	56.1
Field off of Bitney Springs Road	10/88	46.0	60.9	42.7	57.8	36.6	46.8	46.0
12311 McCourtney Road	1/89	57.6	67.3	52.1	68.6	47.5	64.4	57.2
10597 Gold Flat Road	4/88	49.1	65.1	48.0	64.4	43.1	59.1	51.0
11246 Brunswick Drive	12/88	49.5	71.0	48.0	54.0	42.9	57.5	51.0
11184 Tahoe Street	8/89	57.1	73.8	54.4	64.5	49.5	61.6	58.0
Spring Street	12/90	58.9	71.0	58.2	69.0	56.9	70.4	63.6
15135 Wolf Road	12/90	42.0	70.0	36.0	61.0	35.0	62.0	43.1

Community Noise Survey

To document noise exposure in areas of the County containing noise sensitive land uses, this report used existing noise level data collected by the Nevada County Planning Department staff, and noise level data provided to the County in recent consultant reports. Noise sensitive land uses were considered to include residences, parks, schools and hospitals. The noise monitoring sites are representative of typical conditions in the County.

Both short and long-term noise monitoring data were used to describe ambient noise levels within the County. Noise monitoring attempted to record day/evening/ night statistical trends affecting the L_{eq} and other statistical descriptors. Long-term noise monitoring by the Nevada County Planning Department at 10 sites allowed estimates of L_{dn} values at each site, which are summarized in Table VII. Noise level data collected by the Nevada County Planning Department staff at 25 additional sites in 1985, 1987, and 1993 are contained in Table VIII. These locations represent typical rural and residential areas of the unincorporated County. The exact locations are available in the Nevada County Planning Department.

Table VIII
Nevada County Planning Staff
Measured Ambient Noise Levels

Site	1985			1987			1993		
		Sound Level, dB			Sound Level, dB			Sound Level, dB	
	Time	L_{eq}	L_{max}	Time	L_{eq}	L_{max}	Time	L_{eq}	L_{max}
85-1	12:00 - 12:00	40	70	10:05 - 10:20	44.1	61.1	10:45 - 10:55	47.6	60.5
				21:30 - 22:00	43.0	55.0			
				22:00 - 22:30	44.5	50.0			
				22:30 - 23:00	43.5	47.0			
85-10	19:00 -7:00	35	N/A	13:30 - 14:00	39.6	75.2	11:20 - 11:30	40.1	60.9
				20:00 - 21:00	40.4	84.7			
				23:00 - 23:30	38.7	76.2			
				8:00-9:00	43.7	82.8			
85-12	19:00 -7:00	41	56	20:30 - 21:00	38.9	60.9	19:30 - 19:50	36.6	67.0
				22:30 - 23:00	38.5	56.5	22:30 - 23:00	33.1	64.8
							7:15-7:40	43.3	62.6
85-14	19:00 -7:00	38	65	13:17 - 13:37	42.2	61.7	9:50-10:00	44.0	58.1
85-34	11:00 - 12:00	46	69	15:23 - 15:35	47.0	70.6	9:30-9:40	42.5	58.4
85-37	13:00 - 13:20	62.5	87.2	9:38-9:52	44.6	70.8	10:15 - 10:25	43.8	56.6

Table VIII
Nevada County Planning Staff
Measured Ambient Noise Levels

Site	1985			1987			1993		
		Sound Level, dB			Sound Level, dB			Sound Level, dB	
	Time	L_{eq}	L_{max}	Time	L_{eq}	L_{max}	Time	L_{eq}	L_{max}
85-38	10:30 - 23:00	41	63.8	14:33 - 14:48	51.1	69.4	13:45 - 13:55	35.7	52.1
85-40	11:45 - 24:00	44.6	72	15:12 - 15:27	42.9	67.7	14:10 - 14:20	34.3	55.4
85-43	13:05 - 13:25	43.1	68.2	14:30 - 14:50	40	70.4	14:40 - 14:50	44.0	70.3
				21:30 - 22:00	25	32			
				22:00 - 22:30	26.5	58			
85-44	13:25 - 13:45	41.4	68.8	15:01 - 15:21	41.1	65.8	15:00 - 15:10	37.2	54.4
85-50	10:00 - 10:20	42.5	55.4	16:24 - 16:44	57.7	77.8	9:15-9:25	41.9	55.7
85-52	11:00 - 11:20	39.8	51.1	15:51 - 16:11	39.5	63.3	15:20 - 15:30	48.8	62.7
85-59	15:10 - 15:30	44.1	64.8	14:28 - 14:43	39.2	53.2	10:35 - 10:45	45.4	60.9
85-64	8:40-9:00	51.3	73.5	15:58 - 16:13	33.8	53.9	14:00 - 14:10	50.3	71.4
85-66	9:50-10:10	51.2	62.9	12:55 - 13:35	48	77.6	13:20 - 13:30	42.7	61.6
85-71	9:00-9:20	49.1	66.6	10:34 - 10:51	47.8	64.5	16:00 - 16:10	53.2	64.6
85-83	10:50 - 11:10	38.2	52.3	14:39 - 14:59	41.9	69.4			
85-86	12:15 - 12:35	54.9	74.2	14:06 - 14:26	60.4	75.9			

Table VIII
Nevada County Planning Staff
Measured Ambient Noise Levels

Site	1985			1987			1993		
		Sound Level, dB			Sound Level, dB			Sound Level, dB	
	Time	L_{eq}	L_{max}	Time	L_{eq}	L_{max}	Time	L_{eq}	L_{max}
85-87	12:40 - 13:00	57.8	72.2	11:30 - 11:50	61.4	80.4			
85-89	13:30 - 13:50	60.6	70.2	13:35 - 13:55	56.4	70.6			
85-92	14:45 - 15:05	58.6	83.6	10:47 - 11:07	52.7	76.7			
85-93	15:35 - 15:20	52.4	70.1	12:55 - 13:15	60.5	82.3			
85-104	20:00 - 20:20	41	63.8	13:48 - 14:08	45.6	68.2	11:40 - 11:50	43.0	61.1
				21:30 - 22:00	50.0	51.0			
				22:00 - 22:30	51.5	53.0			
				22:30 - 23:00	51.5	53.0			
85-115	20:15 - 20:35	40.6	52.5	13:47 - 14:07	41.6	66.2	13:00 - 13:10	42.1	52.8
				21:30 - 22:00	36.5	48.0			
				22:00 - 22:30	35.0	50.0			
				22:30 - 23:00	34.0	51.0			
85-131	14:00 - 14:05	61.7	70.8	8:57-9:12	60.8	74.1	12:00 - 12:10	55.7	72.5
				21:30 - 22:00	51.5	70.0			

Table VIII
Nevada County Planning Staff
Measured Ambient Noise Levels

Site	1985			1987			1993		
		Sound Level, dB			Sound Level, dB			Sound Level, dB	
	Time	L_{eq}	L_{max}	Time	L_{eq}	L_{max}	Time	L_{eq}	L_{max}
				22:00 - 22:30	55.5	67.0			
				22:30 - 23:00	55.0	66.0			

N/A - Not Available

Appendix A

Approved Noise Prediction Methodology

The following noise prediction methodologies are approved for use in acoustical analyses submitted to Nevada County. Other methodologies may be used if approved by the County Planning Department after review of supporting technical justification.

Traffic Noise

1. The Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) is the preferred traffic noise prediction methodology. The CALVENO standardized noise emission factors must be used (published in FHWA-CA-TL-84/13, "California Vehicle Noise Emission Levels"). Any form of the FHWA Model may be used, such as manual calculation and versions for programmable calculators and computers, including STAMINA.

2. Noise barrier insertion loss shall be calculated using the FHWA Model methodology. The effective center frequency of the noise sources shall be assumed to be 550 Hz. Source heights of 0, 2 and 8 feet above roadway centerline shall be assumed for autos, medium trucks and heavy trucks, respectively.

3. Noise-sensitive receiver locations are assumed to be the backyards of single-family dwellings and the patios and balconies of multi-family dwellings. The exterior receiver height shall be assumed to be 5 feet above backyard or patio elevation for ground-floor receivers, and 4 feet above balcony elevation for upper-floor receivers. The exterior ground-floor receiver shall be placed 10 feet from the building facade. The exterior upper-floor receiver shall be placed midway from the building facade to the edge of the balcony, and a correction factor of +2 dB shall be applied to account for reflections from the building facade.

4. For multi-family developments, common outdoor activity areas are also considered to be noise-sensitive receiver locations. The assumed exterior receiver height is 5 feet above ground level, and the assumed receiver location is normally in the center of the recreation area.

Table A-1
REQUIREMENTS FOR AN ACOUSTICAL ANALYSIS

An acoustical analysis prepared pursuant to the Noise Policies shall:

A. Be the responsibility of the applicant.

B. Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.

C. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources. Noise measurement procedures must be consistent with the ASTM Standard Guide for Measurement of Outdoor Sound Levels (ASTM E1014-84).

D. Estimate existing and projected (20 years) noise levels in terms of L^{dn} or CNEL and/or the standards of Table I-1, and compare those levels to the adopted policies of the Noise Element. Noise prediction methodology must be consistent with the appendix to the Noise Element.

E. Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element. Where the noise source in question consists of intermittent single events, the report must address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance.

F. Estimate noise exposure after the prescribed mitigation measures have been implemented.

G. Describe a post-project assessment program which could be used to evaluate the effectiveness of the proposed mitigation measures.

5. Traffic noise attenuation with distance for ground-level receivers should be consistent with an acoustically "soft" site, at 4.5 dB attenuation per doubling of distance. Noise attenuation for receivers and building facades at upper floors, and for receivers overlooking the roadway, should be consistent with an acoustically "hard" site, at 3 dB attenuation per doubling of distance. These assumptions may be modified on the basis of on-site noise measurements at proposed receiver locations and elevations.

6. Noise measurements for traffic noise analyses should include at least one 15-minute sample of daytime traffic noise levels (including the L^{eq} value) under free-flowing traffic conditions, with a concurrent traffic count. Nighttime traffic noise levels may be estimated from 24-hour noise measurement data or published hourly traffic distribution data. For major arterials and highways, continuous hourly noise measurements over a 24-hour period are recommended to describe the effective day/night traffic distribution and to supplement the 15-minute sample(s). Noise measurement sites should be selected to represent proposed receiver locations and representative sound propagation conditions.

7. Existing traffic volume, truck mix and day/night distribution should be obtained from the Nevada County Department of Transportation or Caltrans, as appropriate. Projected future traffic volume may be obtained from those agencies or the project traffic consultant. Traffic speed shall be assumed to be the posted or projected design speed, unless shown otherwise by observation or noise measurements. Typical traffic data for the Community Plan area is shown by the FHWA Model input data listed in the Master Environmental Assessment.

Railroad Noise

1. The preferred method of predicting railroad noise exposure is to calculate L^{dn} values at the proposed receiver locations based upon on-site single-event and cumulative noise level measurements, assuming noise attenuation of 4.5 dB per doubling of distance for all receiver elevations. Alternative methods include the "Simplified Procedure for Developing Railroad Noise Exposure Contours," prepared by Jack W. Swing of the California Office of Noise Control, and the more detailed procedures prescribed in the Assessment of Noise Environments Around Railroad Operations, Wyle Research Report No. WCR 73-5. In the Community Plan area, variations in site topography, railroad grade and use of warning horns may require adjustments to the modeling assumptions. For this reason, on-site noise measurements and observations are preferred.

2. Noise barrier insertion loss for railroad noise sources should be calculated using standard methods, such as those described by the FHWA Model or in Noise and Vibration Control, by Leo Beranek. Receiver locations for railroad noise exposures are the same as for traffic noise exposures. To account for differences in source heights and frequency content, it may be necessary to determine the relative contribution of different noise sources, such as wheel/rail interaction, locomotives or horns. For a generalized railroad noise source on smooth rails, the effective center frequency of the source may be assumed to be 1,000 Hz with a source height of 10 feet above the rail bed. Other assumptions may be used as supported by published data or experimental results.

3. Day/night distribution of railroad freight operations may be assumed to be uniform over a 24-hour day, unless otherwise indicated by noise measurements or information from the railroad company. Passenger train operations should be distributed according to the published schedules. The numbers and distribution of freight operations may be obtained from the railroad company dispatcher. Refer to the Master Environmental Assessment for typical railroad operations in Nevada City.

4. Railroad noise measurements should include a representative number of single-event noise levels from freight and passenger

operations. Noise levels recorded over a 24-hour period are normally sufficient. The data collected should include the Sound Exposure Level (SEL) and maximum sound level (L^{max}) due to the passage of the train, and a notation of whether a warning horn or whistle was used. The noise levels due to bells at railroad crossings should also be described.

Aircraft Noise

1. Noise produced by aircraft operations at an airport may be described by reference to published noise exposure contours for that airport. If the project site is within the 60 dB CNEL contour of an airport, predicted single-event aircraft noise levels at the project site should be described. Predicted single-event noise levels may be based upon noise measurements at the project site, or by using the FAA's Integrated Noise Model (INM). Aircraft noise levels should be expressed in terms of the Community Noise Equivalent Level (CNEL) and (where applicable) typical SEL and L^{max} values.

2. Noise produced by aircraft operations at other than an established airport should be described in terms of predicted Community Noise Equivalent Level (CNEL), SEL and L^{max} values. Predicted noise levels may be based upon noise measurements at the project site or other representative locations, or may be predicted using the FAA's Integrated Noise Model (INM). Helicopter noise level predictions may also be based upon the data reported in Helicopter Noise Exposure Curves for Use in Environmental Impact Assessment, FAA-EE-82-16.

Interior Noise Levels

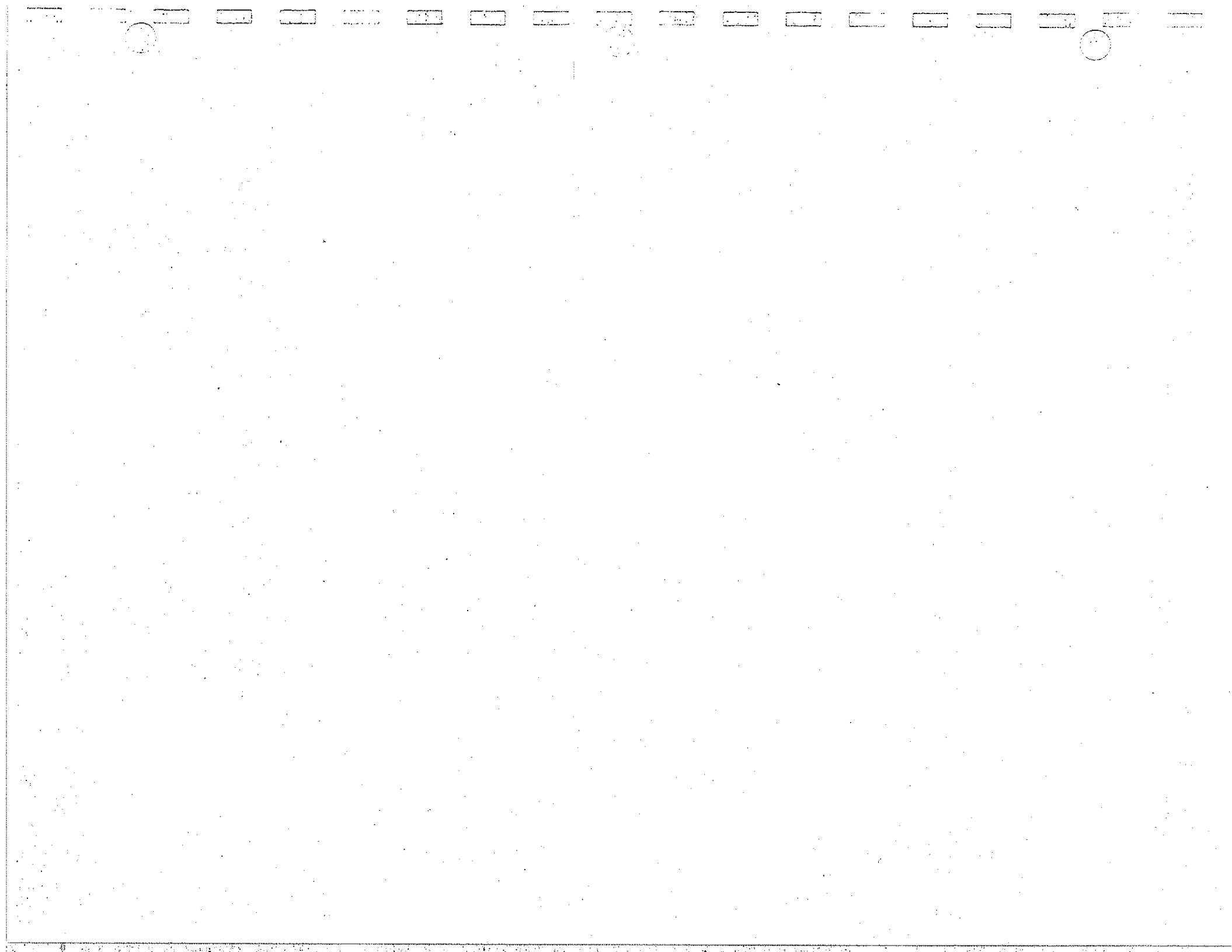
1. Interior noise levels should be calculated from the predicted exterior sound level and source spectrum at the affected building facades, and the sound transmission characteristics of the building facades. The calculation should account for the types and sizes of the building elements used in the facade, the amount of exposure of each facade to the noise source, and the cumulative noise exposure from each facade. If detailed building plans are not available, generalized building descriptions may be employed, subject to review when detailed plans are provided.

2. One-third octave or 1/1 octave band analysis is preferred, describing the source frequency content and facade transmission loss characteristics from 125 Hz to 4,000 Hz. Corrections should also be made for absorption of sound by the receiving room. A safety factor of 3 dB is recommended to allow for potential degradation of acoustical performance from variables in construction and materials. Source spectra and transmission loss values should be obtained from published test results, if available.

3. If it is necessary to close windows and doors to achieve the required interior noise level standard, the analysis should indicate that adequate ventilation must be provided to meet the fresh air

exchange requirements of the Uniform Building Code. Recommendations should also be made to ensure that the ventilation system does not compromise the acoustical integrity of the building facades, and that it does not create excessive interior noise levels, due to its operation.

4. The report should cite the assumptions used for building elements and design features. Any building design features required to achieve the interior noise level standard should be clearly specified.



Nevada County General Plan

Volume 2: Background Data and Analysis

Section 4: Open Space/Conservation Inventory and Open Space Action Program

Natural Resources

Soils

Soil surveys for Nevada County have been conducted by the United States Department of Agriculture Soil Conservation Service (SCS) and the Tahoe National Forest (TNF). The Soil Conservation Service has surveyed the western third of the County, roughly the area west of Scott's Flat Reservoir, while the United States Forest Service has surveyed the balance of the County.

The characteristics of different soil types result in varying constraints in terms of permeability, septic suitability, erosion hazards, agricultural and timber capabilities, etc. Table 1 summarizes some of the basic characteristics of the general soil types found in the County. Soil capability for community development is defined by soil limitations for three factors: dwellings, excavations, and septic tank filter fields. In the SCS Soil Survey, limitations for each of the three factors are defined as "slight", "moderate", or "severe".

All soils within Nevada County present significant ("severe") constraints to septic uses and effluent disposal due to slow permeability, steep slopes (greater then nine percent), and soil depth (less than four feet to bedrock). These same constraints limit the suitability of county soils for installation of pipelines and subsurface infrastructure. Soils with potential "severe" limitations for construction of dwellings or for excavation are also found throughout the county. These soils have limitations due to the slopes, shallow depth to bedrock, and (in some cases) high shrink-well potential. Soil associations with "severe" limitations for dwellings or excavations make up 55 percent of the area surveyed (which covers slightly less area than the Preferred Land Use Alternative map).

Erosion hazard is variable but generally increases near major rivers and with steeper slopes. Although the soils are generally poor for intensive agriculture use, ranging from Class II and up, the moderate to high elevation soils are an excellent resource for timber growth.

Agricultural Resources

Agriculture has played an important role in the development of Nevada County. The soils and climate of Nevada County make it an ideal area for individuals and families to sustain many agricultural endeavors. The primary focus of agriculture in the county has centered on small family farms. This is due to the rolling terrain of the foothills together with the availability of irrigation water.

Type of Soil	Topography	Slope	Permeability	Dwelling Limitations	Septic Limitations	Erosion Hazard	Agricultural Capability	Timber Capability
SOIL CLASSIFICATIONS OF THE SOIL CONSERVATION SERVICE								
Soils of the Lower and Middle Foothills								
Ahwanhee - Sierra Association	gently sloping to steep	2-50%	moderately slow to moderately rapid	slight to severe	severe	moderate to high	III-VII	low
Auburn - Sobrante Association	undulating to steep	2-50%	very slow to moderate	moderate to severe	severe	moderate to very high	III-VI	low
Trabuco - Sierra Association	gently rolling to steep	2-50%	very slow to moderately slow	slight to severe	severe	slight to very high	II-VII	low
Soils of the Mountainous Uplands								
Aiken - Cohasset Association	gently sloping to steep	2-50%	moderately slow to moderatley rapid	slight to severe	slight to severe	high	II-VI	very high
Boomer-Sites - Sobrante Association	undulating to steep	2-50%	slow to moderate	slight to severe	severe	slight to high	II-VII	low to very high
Hoda-Chaix - Musick Association	gently sloping to very steep	5-75%	moderately slow	slight to severe	severe	moderate to high	III-VII	moderately high to very high
Josephine-Sites - Mariposa Association	undulating to very steep	2-75%	moderately slow to moderate	slight to severe	severe	moderate to very high	II-VII	moderately high to very high
Secca - Boomer Association	undulating to steep	2-50%	very slow to moderate	moderate to severe	severe	slight to high	III-VII	low to very high
Placer Diggings-Tailings - Horseshoe Assocation	gently rolling to extremely steep	2-75% 2-75%	moderately slow to very rapid	moderate to severe	variable to severe	variable	III-VII	low to very high
SOIL CLASSIFICATIONS OF THE TAHOE NATIONAL FOREST								
Soils of the Westside								
Hurlburt-Deadwood-Putt	nearly level to fairly steep	2-30% 2-30%	moderately slow to rapid	moderate to severe	severe	moderate to high	N/A	N/A
McCarthy-Crozier-Ledmount	nearly level to fairly steep	2-30% 2-30%	moderately slow to rapid	moderate to severe	severe	moderate to high	N/A	N/A
Soils of the High Elevation								
Tallac-Meiss	level to very steep	2-75%	very slow to very rapid	moderate to severe	severe	slight to moderate	VI-VII	low to very high
Fugawee-WACA-Ahart	level to very steep	2-75%	very slow to very rapid	moderate to severe	severe	moderate to high	VII	low to very high
Rock outcrop	level to very steep	2-75%	very slow to very rapid	severe	severe	high	VII	low to very high
Soils of the Eastside								
Ever-Martis	nearly level to steep	2-50%	rapid over slow	moderate to severe	severe	moderate to high	N/A	N/A
Trojan-Kyburg-Portola	level to very steep	2-30%	moderately slow	moderate to severe	severe	high	N/A	N/A

This trend of small farms has increased over the last 20 years, due to intense development pressures in the area. According to the 1987 Census of Agriculture, there were 386 farms in Nevada County (*farm* is defined as any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold during the census year). This is an increase of 122 percent since 1974. While the number of farms has increased, the size of individual farms has declined 73 percent since 1974. The average size of a farm in Nevada County is 146 acres; 267 farms (69 percent) are less than 50 acres in size.

The increase in farms has included a diversification of crops being raised. Many types of exotic livestock, including llamas, ostriches, colored sheep and pot-belly pigs, as well as the more historical types of livestock, are raised in the county. Numerous fruit and nut crops are raised with the wine grape industry which is attracting national attention. Other agricultural businesses include specialty nurseries, herb farms, mushroom farms, aquaculture, Christmas tree farms, and fuel wood lots.

According to the California Department of Conservation, Farmland Mapping and Monitoring Program there are seven classifications for important farmland. These are as follows: **(1)** prime farmland; **(2)** farmland of statewide importance; **(3)** unique farmland; **(4)** farmland of local importance; **(5)** grazing land; **(6)** urban and built-up land; and **(7)** other land.

When comparing the amount of grazing land to the amount of other land, western Nevada County is divided fairly evenly. The eastern and central portions are dominated by areas of other land, while the northern and western portions are primarily grazing land. Farmland of local importance is scattered throughout western Nevada County with major concentrations occurring northeast and east of Nevada City, around the perimeter of Penn Valley and Lake Wildwood, west of Golden Oaks, and southwest of Chicago Park. Prime farmland, farmland of statewide importance and unique farmland are very minimal in western Nevada County. Small acreages of prime farmland occur in Chicago Park, near Grass Valley, near Penn Valley, north of Alta Sierra and in other scattered locations. Small acreages of farmland of statewide importance occur north of Newtown Road, south of Lake of the Pines, west of Wolf Road, west of Willaura Estates, in Penn Valley and near Lake Wildwood, south of Sweetland, near North San Juan, south of North Columbia, and in other scattered locations. Small acreages of unique farmland occur in Chicago Park, north of Alta Sierra, southwest of Grass Valley, in Penn Valley, west of Newtown, near Peardale, south of Nevada City, near Cherokee, and northwest of Nevada City Airport. Eastern Nevada County contains no important agricultural farmlands.

Data contained in the Important Farmlands Maps has been utilized in preparation of the policies and Land Use Maps contained in Volume 1 of the General Plan. Due to the scale of the Important Farmland Maps, they have not been included in this Inventory but are on file at the Nevada County Planning Department.

Forestry

Nevada County supports an extensive timber resource, the majority of which is under the jurisdiction of the Tahoe National Forest (TNF). According to the Soil Conservation Service, "forests are one of the important resources of the Nevada County area. They supply raw material for one of the major industries, provide

recreation and aesthetic enjoyment for many people, provide food and cover for many forms of wildlife, and protect watersheds."

There are three categories of land under the jurisdiction of the TNF: timberlands, woodlands, and chaparral. The following is a brief discussion of each vegetational category.

Timberlands: Timberlands are those lands capable, available and suitable for commercial timber production. Considered a renewable resource, commercial timberlands are located primarily in the mid and eastern areas of the county, in elevations ranging from 1,200 feet above sea level in the west to over 9,000 feet in the east. Of the approximately 629,000 acres considered suitable for timber production in the TNF, 449,842 acres are categorized as prime forest land.

Woodlands: Woodlands in the TNF occur throughout the forest and are defined as forested land not suitable for timber production. These forested lands provide opportunities for important wildlife habitat, vegetation diversity, firewood resources, and multiple-use considerations. Forested land considered as woodlands are included in Table 2 .

Chaparral: Two-thirds of the chaparral lands in the TNF occur in scattered parcels of less than 100 acres. About 8 percent are in areas needing reforestation and another 11 percent are on slopes greater that 50 percent. These lands are primarily managed as wildlife habitat. Table 2 identifies the types of chaparral vegetation in the TNF.

Geology

Nevada County is part of the Sierra Nevada Range, a geologic block approximately 400 miles long and 80 miles wide which extends in a north-south band along the eastern portion of California. The terrain of Nevada County is distinctly characterized by two features of the Sierra Nevada Range. The western third of the County is comprised of rolling foothills which form a transition between the low-lying Sacramento Valley and the mountains to the east. The eastern two-thirds of the County is comprised of the steep terrain and exposed granite of the Sierra Nevada range itself.

The geologic substructure of the county can be divided into three very broad groups:

- **Western Foothills:** This area, extending from the Yuba County border to just northeast of the Grass Valley/Nevada City area, is generally comprised of metavolcanic (Mesozoic Jura-Trias Metavolcanic) and granitic (Mesozoic Granitic) formations.

- **Central Portion:** The area extending northeast of the Grass Valley/Nevada City area to the upper mountainous area near Bowman Lake Road is generally comprised of sedimentary and metasedimentary (Paleozoic Marine Metasedimentary) and volcanic (Cenozoic Volcanic) formations.

Table 2 CATEGORIES OF VEGETATION IN THE TAHOE NATIONAL FOREST

Timberlands	*Acres*
Mixed Conifer	361,797
Red Fir	100,818
Eastside Pine	104,281
Lodgepole Pine	9,041
Hardwood-Conifer	36,660
Reforestation and TSI Needs	16,256
TOTAL	629,018

Woodland Vegetation	*Acres*
Live Oak and associated hardwoods	26,483
Black Oak, Tanoak, and Madrone	5,881
Knobcone Pine	285
Digger Pine	139
Juniper	1,534
Aspen (pure stands larger than 10 acres)	75
TOTAL	34,397

Chaparral Vegetation	*Acres*
Brushland capable of reforestation	6,439
Areas less than 100 acres	53,748
Areas less than 100 acres with slopes over 50 percent	8,453
Basin Sage, Bitterbrush, Mountain Mahogany with Perennial Grass, and Wyethia	6,607
Huckleberry Oak, Wyethia, Forbs, Perennial Grass	2,397
Whiteleaf Manzanita, Deerbrush, Bear Clover	1,141
Tobacco Brush, Whitehorn, Greenleaf Manzanita, Huckleberry Oak, Wyethia	392
Whiteleaf Manzanita, Annual Grass, Forbs	136
TOTAL	79,313

- **Eastern Half:** This portion of the County is generally comprised of volcanic (Cenozoic Volcanic) and granitic (Mesozoic Granitic) formations.

Geologic Hazards

Active Faults and Earthquakes

Faults are breaks and fractures in the earth's crust accompanied by a displacement of one side relative to the other. An earthquake occurs when there is movement along a fault. The greater the number of faults within an area, the greater the risk of seismic activity. The amount of seismic risk involved with a fault is dependent upon several factors, including fault size, depth and length, and fault activity. Seismic risk increases as fault depth decreases and length increases. Whether or not a fault is considered to be active is based on fault movement at or near the surface of the ground during a given period of time. The California Department of Conservation, Division of Mines and Geology (DMG) defines faults as "potentially active" (where movement has occurred within the past two million years) and "sufficiently active" (where movement has occurred within the past 10,000-12,000 years).

Additionally, faults within California are divided into three categories: prequaternary (older than two million years), quaternary (younger than two million years), and historic (less than 200 years). As shown on Figure 1, prequaternary faults can be found in the County's western half, running generally in a north-south direction. Although this portion of the County contains relatively inactive faults, it should be known that a very high percentage of buildings within the high-density areas of Grass Valley and Nevada City are quite old, and damage in these areas might be considerable if a major earthquake occurs, despite the fact that most of the buildings are only one or two stories.

Quaternary and historic faults can be found in the eastern portion of the County near Truckee. Of particular note is the Dog Valley fault which runs through Truckee from Prosser Reservoir past Boca Reservoir to Stampede Reservoir in Sierra County. This fault poses a potentially hazardous situation, since a large earthquake could result in dam failure.

Seismic, or earthquake hazards, can be divided into two areas: primary hazards, caused by the actual rupture or shaking of the ground; and secondary hazards, caused by various topographic and hydrologic conditions triggered by the earthquake (see Flood Hazard/Dam Failure section for further discussion).

Actual ground breakage generally affects only those buildings directly over or nearby the fault. Ground shaking generally has a much greater impact over a larger geographical area. The amount of breakage and shaking is a function of earthquake magnitude, type of bedrock, depth and type of soil, general topography, and groundwater. In the Sierra Nevada Range, the common occurrence of relatively shallow weathered material underlain by dense bedrock lessens the seismic risk.

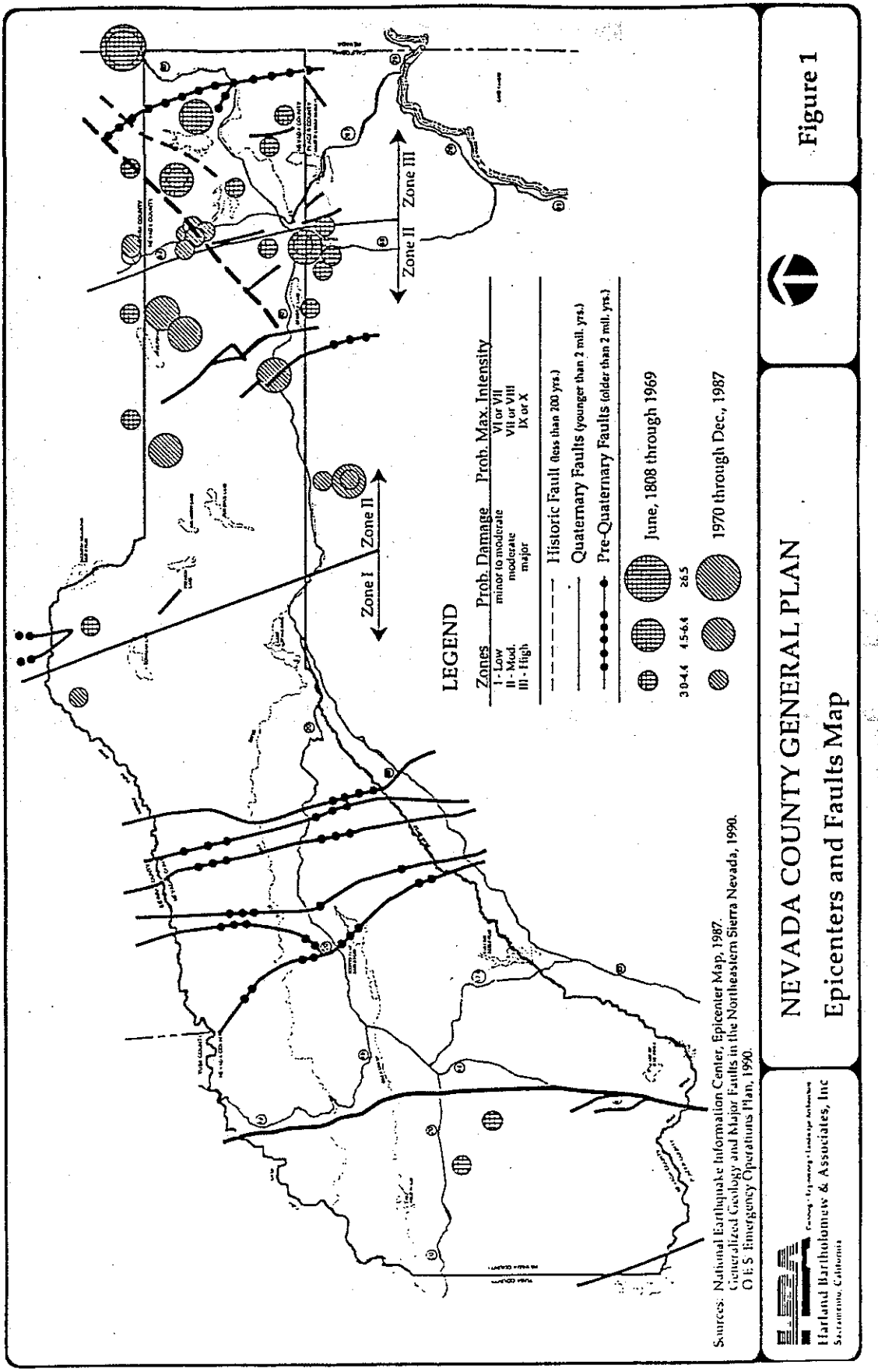

NEVADA COUNTY GENERAL PLAN
Epicenters and Faults Map
Figure 1
Harland Bartholomew & Associates, Inc
LEGEND
Zones
I - Low
II - Mod.
III - High
Prob. Damage
minor to moderate
moderate
major
Prob. Max. Intensity
VI or VII
VII or VIII
IX or X
Historic Fault (less than 200 yrs.)
Quaternary Faults (younger than 2 mil. yrs.)
Pre-Quaternary Faults (older than 2 mil. yrs.)
30-4.4
4.5-6.4
≥6.5
June, 1808 through 1969
1970 through Dec., 1987
Zone I
Zone II
Zone II
Zone III
Sources: National Earthquake Information Center, Epicenter Map, 1987.
Generalized Geology and Major Faults in the Northeastern Sierra Nevada, 1990.
O.E.S. Emergency Operations Plan, 1990.

Table 3 SEISMIC ACTIVITY SCALES

Richter Magnitude Scale	Modified Mercalli Scale	Description
2	I-II	Usually detected only by instruments or very few people under favorable conditions.
3	III	Felt indoors.
4	IV-V	Felt by nearly everyone, minor damage.
5	VI-VII	Everybody runs outdoors, damage minor to moderate.
6	VIII	Everybody runs outdoors, damage moderate to major, depending upon quality of buildings.
7	IX-X	Damage major, many well-built buildings destroyed, ground cracked, landslides.
8	XI-XII	Virtually total damage, nearly all buildings destroyed, large fissures in ground.

This is consistent with the fact that many authorities list igneous and metamorphic bedrock (found extensively throughout Nevada County) as providing the least amount of seismic hazard due to ground shaking. Hazard due to ground breakage is considerably less dependent upon the kind of bedrock.

Secondary hazards include ground settlement or subsidence, which is caused when poorly consolidated soils are compacted; liquefaction, which occurs when a shock or strain causes a sudden loss of soil strength in saturated cohesionless soils; and landslides which are part of the process of erosion that can be triggered by earthquake shock.

Generally, potential damage resulting from earthquakes is relative to the magnitude of the quake, the local rock and soil characteristics, and the vulnerability of property to the resulting quake intensity. Therefore, the hazard of an earthquake is based on the interrelationships between faults, weak geologic materials, and human activity (Petak). Table 3 summarizes the relationship between earthquake magnitude and earthquake damage.

Since 1887, the Nevada County area has experienced 26 earthquakes at a Modified Mercalli Intensity (MMI) of VI or VII and ten at a MMI of VIII (see Figure 1). No major earthquakes at an MMI of X or greater have occurred in the Nevada County area (OES, 1988). The latest earthquake to affect Nevada County was the Boca or Truckee earthquake of 1966 which had a Richter magnitude of 5.4 and an MMI of VII (OES, 1988). Twenty-one after shocks at a magnitude of four or greater were felt in the area, with Russell Valley generally believed to be the location of the earthquake's epicenter. Although damage was extensive in the area, it was minor in scale, occurring almost entirely in unconsolidated natural fill. Relatively slight damage occurred to bridges along Highway 80 and both Prosser and Boca earthfill dams. The earthquake was also noticeably felt in western Nevada County.

Because Nevada County, and most of the State of California, is a seismically-active region, the potential for earthquake-induced hazards must be acknowledged. However, the history of past earthquake activity does not indicate that Nevada County is a particularly hazardous area. Current engineering design, and construction practices, such as the Uniform Building Code, provide the opportunity to reduce earthquake related hazards.

Landslides

A landslide can be defined as an event in which surface masses of slope-forming earth move outward and downward from their underlying and stable floors in response to the force of gravity. This occurs whenever "shear resistance" of the mass is exceeded by the "shear stress." Such movements include:

- **Falls:** Falling of soil or rock masses where a sliding surface does not occur.
- **Flows:** Surface material breaks up and moves down a slope and flows as viscous fluid.
- **Creeps:** Slow down-slope movements of an earth mass.
- **Transitional or Rotational Slides:** Movements of earth involving a distinct rupture or zone of weakness separating the earth slide.

Unstable or potentially unstable slopes are those areas susceptible to falls, flows, creeps, or slides. Topography, climate, geology, and hydrology are factors contributing to slope instability. The degree of severity of these factors and their interactions is what determines potential hazard.

Because much of Nevada County is steeply sloping, the threat of landslides is ever present. However, due to the fact that most of the soils within the County are underlain with dense bedrock, and lack the depth and cohesionless structure associated with ground failure, most secondary hazards should be considered moderate at worst. Some communities have assigned a "low risk" landslide rating to all areas with igneous and metamorphic bedrock, and since most of the Nevada County is underlain with similar formations, it is a safe assumption to assign a similar "low risk" rating to most of the County (see Figure 2). The "low risk" rating would apply to ground settlement and liquefaction hazards, as well.

It should be noted that mapping of landslide activity in Nevada County has not been done in over 20 years. In addition, there has been no mapping done that includes the locations of hydraulic mining-related landslide activity. Due to this lack of adequate and updated mapping, Figure 2 shows only generalized areas of past landslide activity.

Even though geologic conditions in Nevada County reduce the potential hazards from ground failure and landslides, the County's steep terrain and deep snowpack present the potential for earthquake induced avalanches in the mountainous areas. Further discussion of avalanche hazards and landslides induced by mining activity, can be found in the Open Space for Health and Safety section.

Hydrology

Water Resources

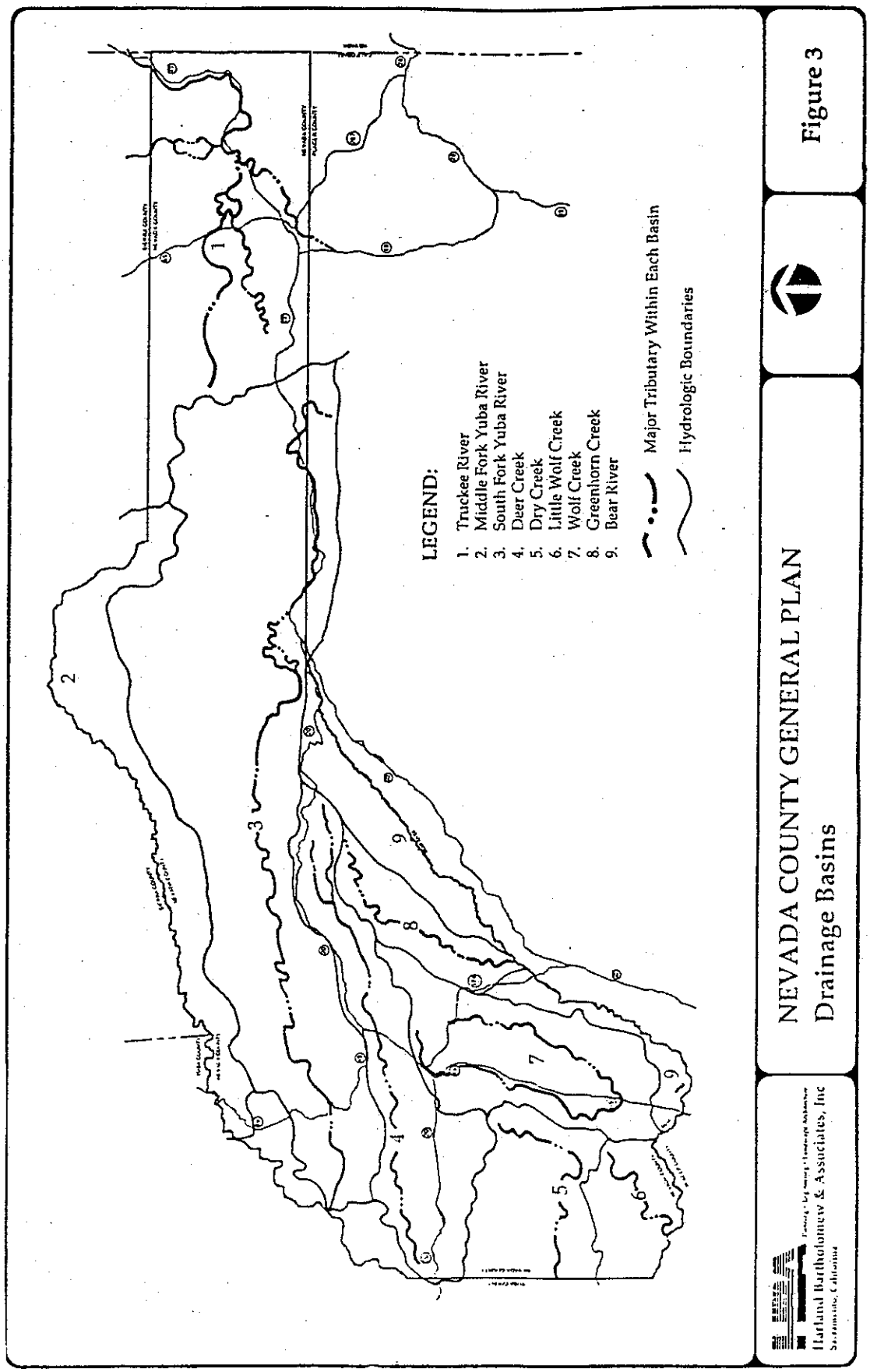
Surface water drainage within Nevada County is composed of three separate watersheds that when combined produce enough water to serve portions of both northern California and western Nevada. The three major watershed areas include:

- The Truckee River basin;
- The Yuba River basin; and
- The Bear River basin.

The Truckee River basin drains approximately 170 square miles within the County and flows from Lake Tahoe in a northeastern direction through Nevada County into Pyramid Lake in the State of Nevada.

The South Fork and Middle Fork of the Yuba River combined make up the largest of the three watershed areas within Nevada County. The Middle Fork of the River drains approximately 86 square miles of Nevada County and eventually drains into Englebright Reservoir. The South Fork drains approximately 343 square miles of the County before connecting with the Middle Fork of the Yuba River near Englebright Reservoir.

Numbers Indicate Relative Amounts of Landslides
(1=Least Amount; 6=Most Amount)
4
3
2
Source: US Geological Service, Open File Report, 1970.
Harland Bartholomew & Associates, Inc
NEVADA COUNTY GENERAL PLAN
Landslide Activity
Figure 2


LEGEND:
1. Truckee River
2. Middle Fork Yuba River
3. South Fork Yuba River
4. Deer Creek
5. Dry Creek
6. Little Wolf Creek
7. Wolf Creek
8. Greenhorn Creek
9. Bear River
Major Tributary Within Each Basin
Hydrologic Boundaries
NEVADA COUNTY GENERAL PLAN
Drainage Basins
Figure 3

The third basin, the Bear River, forms just below Spaulding Reservoir, flows in a southwesterly direction and drains approximately 277 square miles of Nevada County.

Many of the creeks and rivers in the County supply both water and hydroelectricity. A variety of impoundments, canals and diversions serve to divert water to these uses. As would be expected, all of the hydrologic features in the County are dependent on winter rain and snowfall. The Sierra snowpack is the primary source of water throughout the watersheds. The low season for water is typically summer, however the current drought figures have not yet been tabulated. Peak months vary due to snow melt, with rainfall peaks typically occurring in the November-February period and snowmelt-related peak typically occurring between April and June. The seasonal as well as annual river flows are highly variable. During extremely heavy storms, the maximum daily flow can be on the order of 25 to 50 percent of average annual flow.

Most of the water bodies in the County support or contribute to the wildlife values by providing habitat as well as necessary drinking water. Figure 3 presents a hydrography map of the County which illustrates all of the perennial and seasonal (or intermittent) water courses. As illustrated by the map, Nevada County is characterized by a large and diverse hydrologic system.

Groundwater

The groundwater resources in the County are of two distinct types. Those in the Western County are characterized as poorly defined and variable. The highly fractured characteristics of the subsurface geology, as well as a variety of other factors such as soil depth and percolation, combine to create highly variable and inconsistent groundwater characteristics. In eastern Nevada County, the Martis Valley aquifer is the primary subsurface hydrologic resource. This aquifer is currently under study to determine its total storage, its recharge and its safe yield.

Water Quality

Levels of water quality vary within Nevada County. In the more mountainous, less-developed areas, the water quality is generally very good; however, as elevation decreases, so does water quality. This is partially due to inadequate septic tank filtration as the water passes through the more populated areas of the County and also has been affected by the quality of effluent from public sewage treatment systems. Other variables that may contribute to water quality degradation include:

1. Soil erosion with resultant sedimentation;
2. Inadequate soils;
3. Improper development; and
4. Naturally occurring elements.

Soil erosion and sedimentation are closely tied to surface water quality. The Dictionary of Geological Terms defines erosion as the process of loosening or dissolving earthy or rock material by water or wind sources into smaller particles. The smallest of those particles may be transported and deposited by water or air constituting the process of siltation. These silt elements typically consist of 80 percent soil or silt and less than 12 percent clay. Sedimentation occurs when the larger particles consolidate into another rock or earthen material and are deposited on the beds of creeks, rivers or streams. Eroding soils, siltation, and streambed alteration as a result of new subdivision development contribute to a lower level of surface water quality within Nevada County. Naturally occurring elements such as heavy metals, have also contributed to water quality degradation in a number of areas within the western county. The eastern Nevada County is currently being tested by Department of Water Resources for radon.

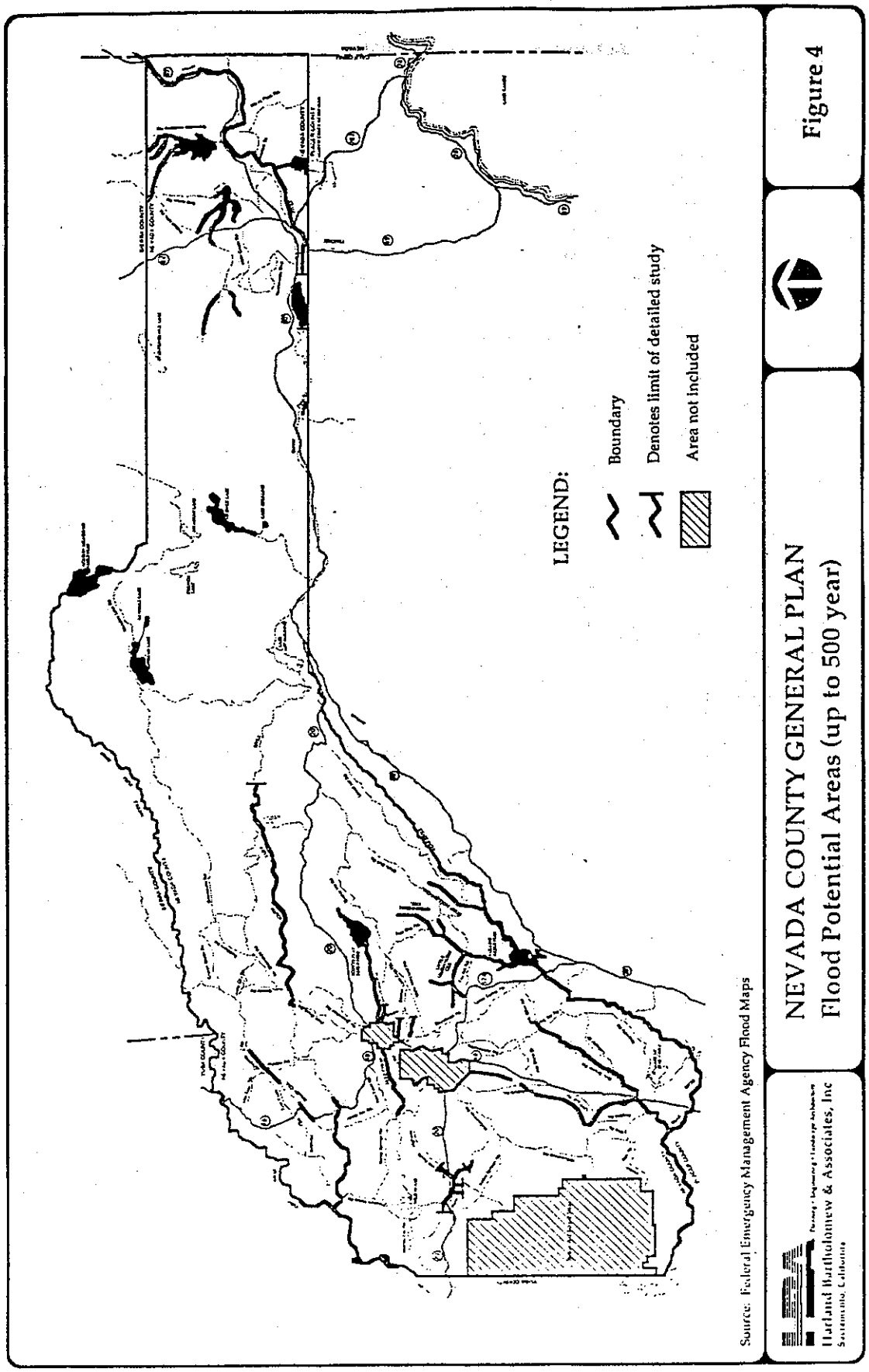
The State Water Resources Control Board (Central Valley Region and Lahontan Region) is responsible for water quality of wetlands, rivers and streams, lakes and groundwater in Nevada County. Data listed in *Appendix A of the Nevada County Master Environmental Inventory (MEI)* presents the results of their April 1991 Statewide Water Quality Assessment. In summary, the range of water quality impacts in Nevada County result from sewage contamination (bacteria), grazing and ORV uses (sedimentation), recreational impacts (sedimentation), watershed disturbances such as logging (sedimentation), water diversions, hydrologic modification, urban runoff (hydrocarbon), heavy metals, and eutrophication. The consequences of these conditions are limits on beneficial uses such as domestic water supplies, habitat values, agricultural uses, recreational uses and groundwater recharge. Water quality tends to degrade in the upper elevations as a result of recreational and logging uses, while the lower elevations are affected by land development, mining, grazing and domestic sewage contamination.

Flood Hazard/Dam Failure

Flooding of lands adjacent to streams and rivers are caused by flows that exceed the capacity of the normal water course. This type of flooding involves the spill-over of above-normal stream flows onto lands immediately adjacent to the normal watercourse. Those areas subject to overflow are referred to as the stream or river's flood plain. Areas within Nevada County subject to 100-year and 500-year flooding are mapped on Figure 4. As shown on the figure, the flood hazard areas are generally confined to the areas adjacent to the County's local rivers and streams.

In general, there are no significant wide flood plains within the County as would be found in areas with less general slope. Squirrel Creek in Penn Valley is relatively wider than other flood potential areas within the County, but is not considered a wide floodplain when compared to those identified in the Central Valley, which cover thousands of acres. The major flooding problems normally occur during the winter months from November through April. Flooding can be severe when the ground is already saturated or existing snow is melted by warmer rains.

Dam failure is another form of flood hazard. Failure can occur as a result of manmade or natural causes. Such causes include improper siting, structural design flaws, erosion of the face of foundation, earthquakes, massive landslides, and rapidly rising flood waters.


LEGEND:
Boundary
Denotes limit of detailed study
Area not included
Source: Federal Emergency Management Agency Flood Maps
Harland Bartholomew & Associates, Inc
NEVADA COUNTY GENERAL PLAN
Flood Potential Areas (up to 500 year)
Figure 4

There are 12 dams located within Nevada County, owned and/or operated by various agencies or organizations. These include:

- Scott's Flat Dam (Upper) (Nevada Irrigation District (NID));
- Lower Scott's Flat Dam (NID);
- Rollins Dam (NID);
- Combie Dam (NID);
- Magnolia Dam (Lake of the Pines Home Owners Association);
- Bowman Dam (NID);
- Jackson Meadows Dam (NID);
- Martis Creek Dam (U.S. Army Corps of Engineers);
- Prosser Creek Reservoir Dam (U.S. Army Corps of Engineers);
- Boca Reservoir Dam (Bureau of Reclamation);
- Spaulding Reservoir (Pacific Gas & Electric);
- Englebright Reservoir (U.S. Army Corps of Engineers);
- Lake Wildwood (Lake Wildwood Home Owners Association);
- Donner Lake (Sierra Pacific Power); and
- Independence Lake (Sierra Pacific Power)

Populations occur within the inundation zone of several of these dams. According to the Office of Emergency Services for Nevada County, of particular concern is the failure of either the Upper or Lower Scott's Flat Dams. The failure of such a dam would most likely be the result of an earthquake magnitude of MMI X (see Table 3). The inundation zone of these dams include Nevada City, Bitney Springs Road and Deer Creek, and a portion of Newtown Road and the Lake Wildwood Subdivision. However, the area of Nevada County in which these dams exist is not located within an historical seismic zone. In fact, the western half of the County resides within the lowest "Maximum Expectable Earthquake Intensity" zone in California (see Table 3 and Figure 1).

As discussed above, the far eastern portion of the County is classified in the highest earthquake intensity zone. Within this area are three major dams; Prosser Creek Reservoir Dam, Stampede Reservoir Dam (located within Sierra County), and Boca Reservoir Dam. A Seismotechtonic Study of the Truckee/Lake Tahoe Area identified two major faults believed to be "potential seismic sources of greatest significance" in the eastern portion of the County - The Mohawk and Dog Valley Faults. The Dog Valley Fault appears to be the more active of the two and of special significance due to its close proximity to the three dams listed above. However, the Truckee earthquake of 1966 had a magnitude of 5.4 and an intensity of VII, but only relatively slight damage occurred to both Prosser and Boca earthfill dams (OES).

Also worth noting is the hazard of seiches. Seiches are seismically induced waves in bodies of water that can be considered a flood-related hazard. There is still much to learn about seiches, but it is known that they are particularly hazardous where lakes and reservoirs are bordered by campgrounds or other facilities on flat banks. Because of the large number of recreational lakes in Nevada County, seismically-induced seiches could prove very damaging. However, most recorded seiches have proved rather menial. The Alaskan earthquake of 1964 for example, produced seiches no larger than 1.2 feet. Considering the overall seismic risk in this County, seiche risk should be considered only a moderate hazard.

Vegetation, Fish and Wildlife

Nevada County contains an extremely wide range of plants, animals and habitat types. With topographic elevations ranging from 300 feet in the west to 9,143 feet in the east and precipitation (snow or rainfall) amounts varying from 30 inches in the west to 60 inches in Nevada City and near the crest of the Sierras, the County supports a true diversity of habitat types. Generally, the county can be characterized by gently rolling oak woodlands in the west transitioning to coniferous forest and then to an almost desert-like association on the eastern slope of the Sierras. A given type of vegetation association, with associated animal life, is referred to as a life zone. A life zone is an area generally uniform of homogeneous characteristics located within very general geographic boundaries. The life zones which exist in Nevada County include: Upper Sonoran, Transition, Canadian, Hudsonian, Arctic-Alpine and Mixed Conifer-Jeffrey Pine-Sagebrush. Table 4 presents a description of the six life zones which occur in the county. The table identifies the basic habitat groups which occur in each zone and presents a characterization of the dominant vegetation and wildlife species which occur in each zone.

Habitats

The State of California Department of Fish and Game (DFG) recognizes five primary wildlife habitat types in California: tree dominated; shrub dominated; herbaceous dominated; aquatic; and developed. Each of these basic habitat types is further subdivided as shown in Table 5 and has been identified in Table 4. *Appendix B of the Nevada County Master Environmental Inventory* contains a brief description of each community.

These habitats occur in continuous stretches, as well as isolated "pockets" depending on the overall topography, elevation, climate and pattern of development of a particular area. Animals may move between various habitat types to satisfy their life requirements. Animals will utilize riparian corridors, low lying or "saddle" areas of ridges, established trails, and other corridors for this inter-habitat movement. In addition, many species including deer move seasonally throughout the county in response to their seasonal habitat requirements. In this context, it is possible that loss of a habitat could constitute an adverse effect (because of local or regional scarcity and ecological value of a habitat) even though the individual species of plants which make up the habitat, or animal species which use the habitat may not, in and of themselves, be endangered or rare.

Habitats throughout the county have been modified by human activity. The western portion of the county, especially the Upper Sonoran and Transition life zones, have experienced rapid residential growth in recent years and the resultant parcelization, fencing, alteration of vegetation, introduction of cats and dogs, roadways, noise and night lighting have served to reduce the habitat values throughout the area. In the mid to high elevations, logging, mining, and development of second homes and rural subdivisions have also served to alter habitats. Habitat values can be reduced by both direct (construction of housing) and indirect (increased density in wide movement corridors) activities. Although the overall trend in the county is toward a decline in habitat values as identified by the DFG, there is a wide localized variation in habitats, tolerances of species and degrees of human disturbance. In some cases, disruption of predator-prey balances occur; in others, food sources are affected; while in others, breeding or birthing areas are disturbed.

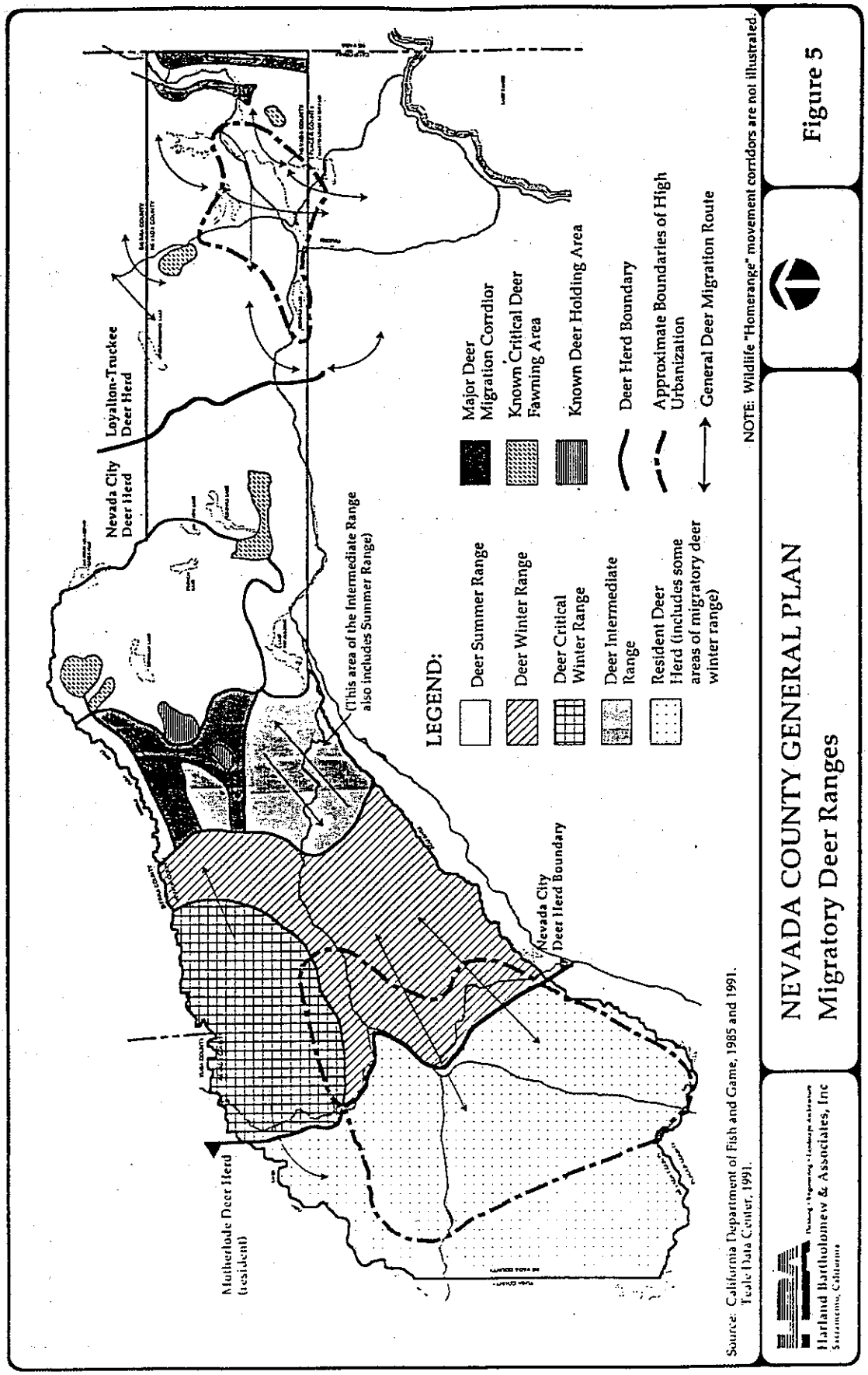
Life Zone	General Characteristics	Typical DFG Habitat Types	Primary Vegetation	Primary Wildlife
Upper Sonoran Life Zone (1)	Exists in western portion of County; grasslands with various shrubs and trees; dry summers, moderate winters; rainfall = 15-40 in./year; growth season = 6-10 months; lack of adequate moisture	Ponderosa Pin; Closed-Cone Pine-Cypress; Montane Hardwood-Conifer; Montane Hardwood; Valley Oak Woodland; Blue Oak-Digger Pine; Valley Foothill Riparian; Montane Chaparral; Mixed Chaparral; Annual Grassland; Fresh Emergent Wetland; Riverine, Lacustrine; Urban, Orchard-Vineyard	Digger Pine; Interior Live Oak; Scotch Broom; Redbud; Buckeye; Chamise; Poison Oak; Toyon; Soap plant; Fawn Lily; Mistletoe; Buttercup; California Poppy; Bush Lupin	Red-legged frog; striped racer; common kingsnake; western rattlesnake, California jay; plain titmouse; wrentit; yellow warbler common wren; California thrasher; brown towhee; brush rabbit; grey fox; ring tail; raccoon; spotted skunk; striped skunk; mule deer; mountain lion mosquito fish; small mouth bass; large mouth bass; foothill yellow-legged frog
Transition Life Zone (2)	Between Upper Sonoran and Canadian Zones; rainfall = 25-80 in./year; growth season = 4-7 months; good for growing timber	Sierran Mixed Conifer; Ponderosa Pine; Closed-Cone Pine-Cypress; Montane Hardwood-Conifer; Montane Hardwood; Montane Riparian; Valley Foothill Riparian; Montane Chaparral; Mixed Chaparral; Chamise-Redshank Chaparral; Wet Meadow; Fresh Emergent Wetland; Riverine; Urban; Lacustrine; Orchard-Vineyard	Ponderosa Pine; Sugar Pine; Douglas Fir; White Fir; Incense Cedar; Black Oak; Black Cottonwood; Broadleaf Maple; California Dogwood; Buck Brush; Deer Brush; Mountain Misery; Western Azalea; Snow Brush; Squaw Carpet; Larkspur; Anemone; Bleeding Heart; Brown Lupin; Sierra Shooting Star; Pine Drops	Rubber boa; deer; mountain lion; California mountain kingsnake; western rattlesnake; foothill yellow-legged frog; rainbow trout; brown trout; Sacramento squawfish; band-tailed pigeon; pygmy owl; stellar jay; pygmy nut hatch; American robin; russet-backed thrush; orange-crowned warbler; Nashville warbler; spotted owl; California quail; northern goshawk; yellow warbler; yellow breasted chat
Canadian Life Zone (3)	Higher elevations extending to crest of Sierra Nevadas; rainfall = 35-65 in./year; growth season = 3-5 months	Subalpine Conifer; Red Fir; Lodgepole Pine; Sierran Mixed Conifer; White Fir; Montane Hardwood-Conifer; Montane Hardwood; Montane Riparian; Montane Chaparral; Mixed Chaparral; Chamise-Redshank Chaparral; Wet Meadow; Fresh Emergent Wetland; Riverine, Lacustrine; Urban	Red Fir; Jeffrey Pine; Lodgepole Pine; Silver Pine; Aspen; Western Yew; Green Manzanita; Huckleberry Oak; Snowbrush; White Horn; Tobacco Brush Sierra Juniper; Corn Lily; Bush Chinquapin; Sierra Vein-Orchins; Camas Tigerliliy; Snow Plan	Black bear; coyote; Pacific fisher; wolverine; pine marten; Sierra Nevada Red fox; mountain lion; snowshoe hare; stripped skunk; Allen chipmunk; golden mantled squirrel; rainbow trout; brown trout; long-toed salamander; Pacific tree frog; garter snakes; western rattlesnake; mountain white fish; northern goshawk; Williamson sapsucker; Hammond flycatcher; fox sparrow; green-tailed towhee; Lincoln sparrow; Spotted owl; black swift; yellow warbler; willow fly-catcher; yellow breasted chat

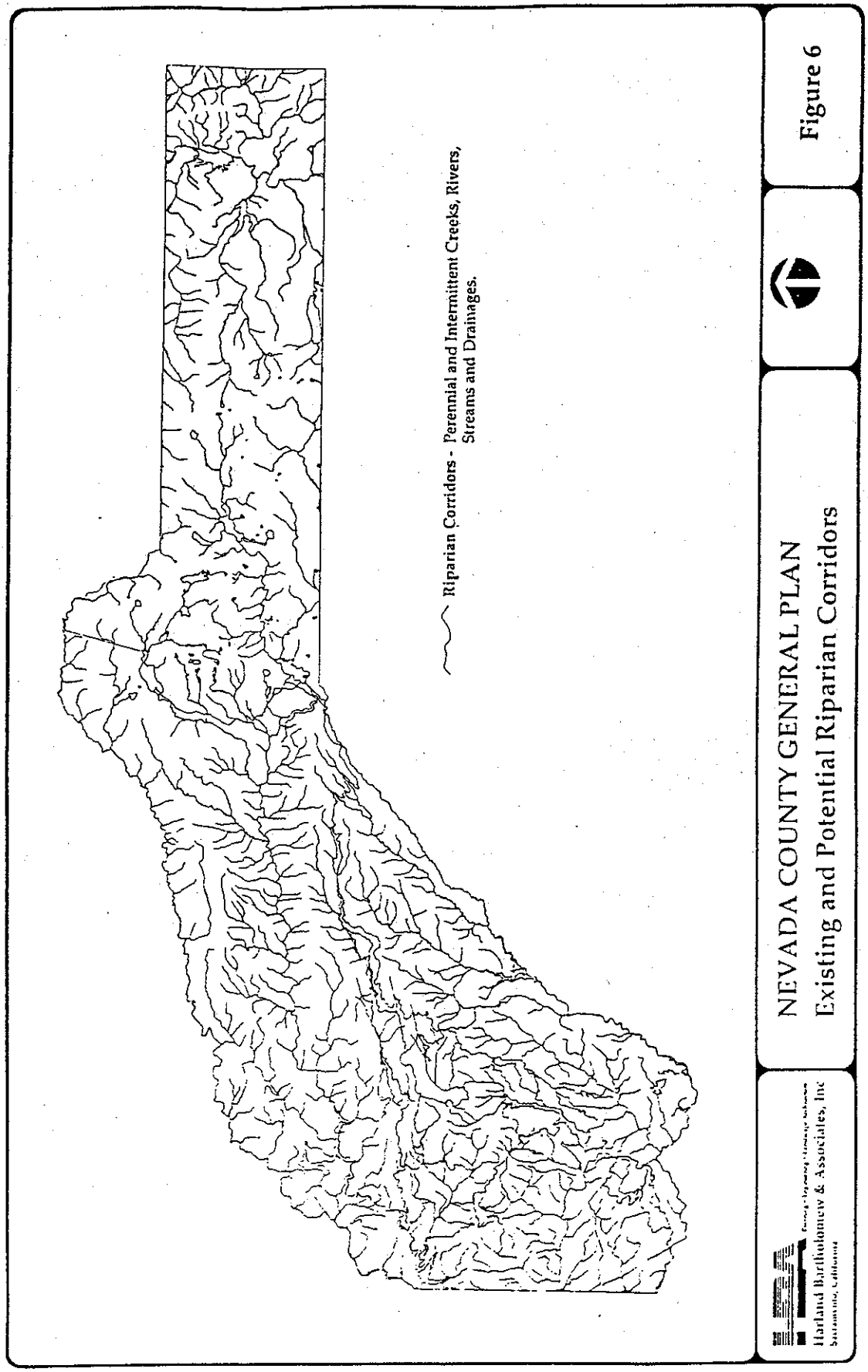
Life Zone	General Characteristics	Typical DFG Habitat Types	Primary Vegetation	Primary Wildlife
Hudsonian Life Zone (4)	Small areas near crest of the Sierra Nevadas; highest zone trees grow; rainfall = 30-50 in./year on western slopes of crest, 15-20 in./year on eastern slopes of crest with snowfall; growth season = 2-3 months	Subalpine Conifer; Red Fir; Lodgepole Pine; Sierran Mixed Conifer; White Fir; Jeffrey Pine; Eastside Pine; Juniper; Montane Hardwood; Montane Riparian; Bitterbrush; Montane Chaparral; Wet Meadow; Fresh Emergent Wetland; Riverine; Lacustrine Urban	Whitebark Pine; Lodgepole Pine; Foxtail Pine; Mountain Hemlock; Red Heather; White Heather; Indian Paintbrush; Stone Crop	Black bear; deer; Pacific fisher; wolverine; pine marten; Sierra Nevada red fox; Pine grosbeak; rosy finch; blue grouse; northern goshawk; willow flycatcher; black swift; yellow warbler; Pacific treefrog; beaver; yellow-bellied marmot; cony; martin; brown trout; rainbow trout; Eastern brook trout; Labontan mountain ephemeral trout; Lahontan lake trout; Lahontan cutthroat trout
Artic-Alpine Life Zone (5)	Only small areas at tip of crest of Sierra Nevadas; climate severe; no trees; rainfall = 25-36 in./year, mostly snowfall; growth season = 1-2 months	Subalpine Conifer; Red Fir; Lodgepole Pine; Whiter Fir; Jeffrey Pine; Eastside Pine; Juniper; Montane Riparian; Bitterbrush; Montane Chaparral; wet meadow; Fresh Emergent Wetland; Riverine; Lacustrine; Urban	Wallflower; prickly-phlox; grasses; sedges	Deer; black bear; mountain lion; Pacific fisher; wolverine; pine marten; Sierra Nevada red fox; blue grouse; willow fly catcher; northern goshawk; black swift
Mixed Conifer-Jeffrey Pine-Sagebrush Life Zone (6)	Eastern portion of County; mixed coniferons forest with brushland; dry area with moderately hot summers; cold winters; rainfall = 10-30 in./year, mostly snowfall; growth season = 2-5 months	Subalpine Conifer; Red Fir; Lodgepole Pine; White Fir; Eastside Pine; Juniper Montane Riparian; Low Sage; Bitterbrush; Sagebrush; Wet Meadow; Fresh Emergent Wetland; Riverine; Lacustrine;	Jeffrey Pine; Lodgepole Pine; Pinon Pine; Incense Cedar; Sagebrush; Bitterbrush; Butterbrush; Mountain Mahogany; Utah Juniper; Corn Lily; Buckwheat; Shrub Pea; Fireweed	Black bear; desert jack rabbit; American badger; pocket mouse; Nuttall cottontail; kangaroo rat; grasshopper mouse; short-tailed vole; deer; wolvering; Pacific fisher; mountain lion; Eastern brook trout; mackinaw trout; brown trout; rainbow trout; Lahontan cut-throat trout; Lahontan mountain ephemeral trout; Lahontan lake trout; long-toed salamander;Pacific tree frog; yellow-legged frog; western fencelizard; sagebrush lizard; horned lizard; western rattlesnake; soy phoebe; pinon jay; black-billed magpie; grey flycatcher; vesper sparrow; blue sparrow; bruewer sparrow; northern goshawk; willow fly catcher; black swift; yellow warbler

Table 5 WILDLIFE HABITATS IN NEVADA COUNTY

Wildlife Habitats in California	Areas of County
TREE DOMINATED HABITATS	
Subalpine Conifer	Western and central
Red Fir	Western and central
Lodgepole Pine	Western and central
MIXED CONIFER	
Sierran Mixed Conifer	Central
White Fir	Central
Jeffrey Pine	Eastern
Ponderosa Pine	Western
Eastside Pine	Eastern
Juniper	Eastern
Closed-cone Pine-cypress	Western and central
Montane Hardwood-Conifer	Western
Montane Hardwood	Western and central
VALLEY FOOTHILL HARDWOOD	
Blue Oak Woodland	
Valley Oak Woodland	Western
VALLEY FOOTHILL HARDWOOD-CONIFER	
Blue Oak-Digger Pine	Western
Montane Riparian	Central and eastern
Valley Foothill Riparian	Western
SHRUB-DOMINATED HABITATS	
Low Sage	Eastern
Bitterbrush	Eastern
Sagebrush	Eastern
Montane Chaparral	Central and western
Mixed Chaparral	Central and western
Chamise-Redshank Chaparral	Central and western
HERBACEOUS-DOMINATED HABITATS	
Annual Grassland	Western
Wet Meadow	Countywide
Fresh Emergent Wetland	Countywide
Pasture	Western
AQUATIC HABITATS	
Riverine	Countywide
Lacustrine	Countywide
DEVELOPED HABITATS	
Cropland	Western
Orchard-Vineyard	Countywide
Urban	

SOURCE: *A Guide to Wildlife Habitats of California, 1988*


Loyalton-Truckee Deer Herd
Nevada City Deer Herd
(This area of the Intermediate Range also includes Summer Range)
Nevada City Deer Herd Boundary
Mutherlode Deer Herd (resident)
LEGEND:
Deer Summer Range
Deer Winter Range
Deer Critical Winter Range
Deer Intermediate Range
Resident Deer Herd (includes some areas of migratory deer winter range)
Major Deer Migration Corridor
Known Critical Deer Fawning Area
Known Deer Holding Area
Deer Herd Boundary
Approximate Boundaries of High Urbanization
General Deer Migration Route
NOTE: Wildlife "Homerange" movement corridors are not illustrated.
Source: California Department of Fish and Game, 1985 and 1991.
Teale Data Center, 1991.
Harland Bartholomew & Associates, Inc
NEVADA COUNTY GENERAL PLAN
Migratory Deer Ranges
Figure 5


Riparian Corridors - Perennial and Intermittent Creeks, Rivers, Streams and Drainages.
NEVADA COUNTY GENERAL PLAN
Existing and Potential Riparian Corridors
Figure 6
Harland Bartholomew & Associates, Inc

While some species may benefit, the larger percentage of species are adversely affected.

Important or Unique Wildlife Habitat Zones

Nevada County supports a variety of wildlife habitats which are important or unique. These habitats consist of movement corridors, wetlands and riparian areas, hardwood areas, and residence/breeding/foraging areas.

Movement corridors serve two primary purposes: first, to enable migratory animals, especially deer, to move seasonally from and between winter and summer habitats, and second, to allow animals to move within their home range or residence areas. Figure 5 illustrates the general deer movement corridors as well as ranges and deer herd boundaries. Seasonal corridors serve to sustain overall habitat values and insure population density and diversity. These corridors are not necessarily individual paths, but can also be characterized as zones or corridors through which animals move. In the case of deer, the corridors serve to link winter and summer habitats which serve the life cycle of the animal. Seasonal corridors therefore tend to run east to west for the Nevada City herd, and more north-south with the Truckee-Loyalton herd. In general, animal movement generally occurs along riparian corridors and/or low-lying "saddles" which connect various micro-habitat areas. The creeks, streams and drainages shown on Figure 6 constitute riparian corridors which are capable of support, for both migratory and resident wildlife movement.

Aside from deer, most mammals in the County move locally through established vegetation. Even corridors which have been impacted by residential development, road construction, or other uses can retain residual values and support animal movement. These areas are shown on Figure 5 as "Approximate Boundaries of High Urbanization".

Wetlands and riparian areas (discussed below) both serve as important habitats in their own right, as well as critical components in animal movement and migration and as supporting habitat for special-status species.

Areas which support migratory populations are essential to the long-term viability of area deer herds, as well as other species which also use the habitat provided by these areas.

Wetlands

Wetlands in Nevada County are generally small, isolated features dependent on riparian water, NID ditch leaks or overflows, diversions by agricultural operations or natural seeps or springs. Man-made or naturally occurring wetlands provide an important biological resource both through provision of localized habitat and habitat for migratory species and as a natural water filtration system. The wetlands of the County are not well mapped but are located throughout the area. The primary issues related to wetlands are loss due to filling as a result of land development; degradation or loss due to interruption of water supply from natural and man-made drainage systems; and degradation due to degraded water quality, resulting from increased pollution from urban runoff, sedimentation, pesticides and herbicides. Nevada County's zoning ordinance, General Provisions Section 3.28 of Chapter II of the Nevada County Land Use and Development Code, provides for protection and replacement of "significant" wetlands.

Hardwoods

Oak woodlands and savannas provide an important habitat which serves as a significant grazing resource for area ranchers, a wildlife habitat of diverse values, and as a source of hardwood. Additionally, oak woodlands and savannas contribute to the overall protection of watersheds by stabilizing soils on even the steepest slopes.

The oak trees of California have been experiencing a significant decline in reproduction rates in recent years. Since 1979, or before, this phenomenon had been documented and concerns have been raised. The decline in regeneration has resulted in a variety of studies and the development of guidelines for resource management. While the Nevada County oak woodlands have not been officially evaluated, oak populations, both locally and statewide, appear to be experiencing a decline in both numbers and regeneration due to impacts of agricultural practices, residential development, and cord wood harvesting (affecting primarily Blue Oak and Black Oak) in the western foothill area and due to timber practices in the mid-county area (affecting Black Oak).

As contributions to wildlife values, oaks are extremely important. Oak trees, although varying by species and by associated plant communities, provide food (acorns), shelter, roosting, and nesting habitats for a wide variety of birds. The understory associated with the oaks can also provide browsing, shelter and breeding habitat for mammals, insects and reptiles. They also provide micro-habitats due to their shading characteristics, which contribute to the overall diversity of species in areas where they occur. Of all these characteristics, the provision of acorns as a food source appears to be the most significant contribution. As stands of oaks or individual trees age, their production of acorns peaks and then begins to decline. Therefore, consistent regeneration is needed to ensure ongoing supplies of trees and acorns.

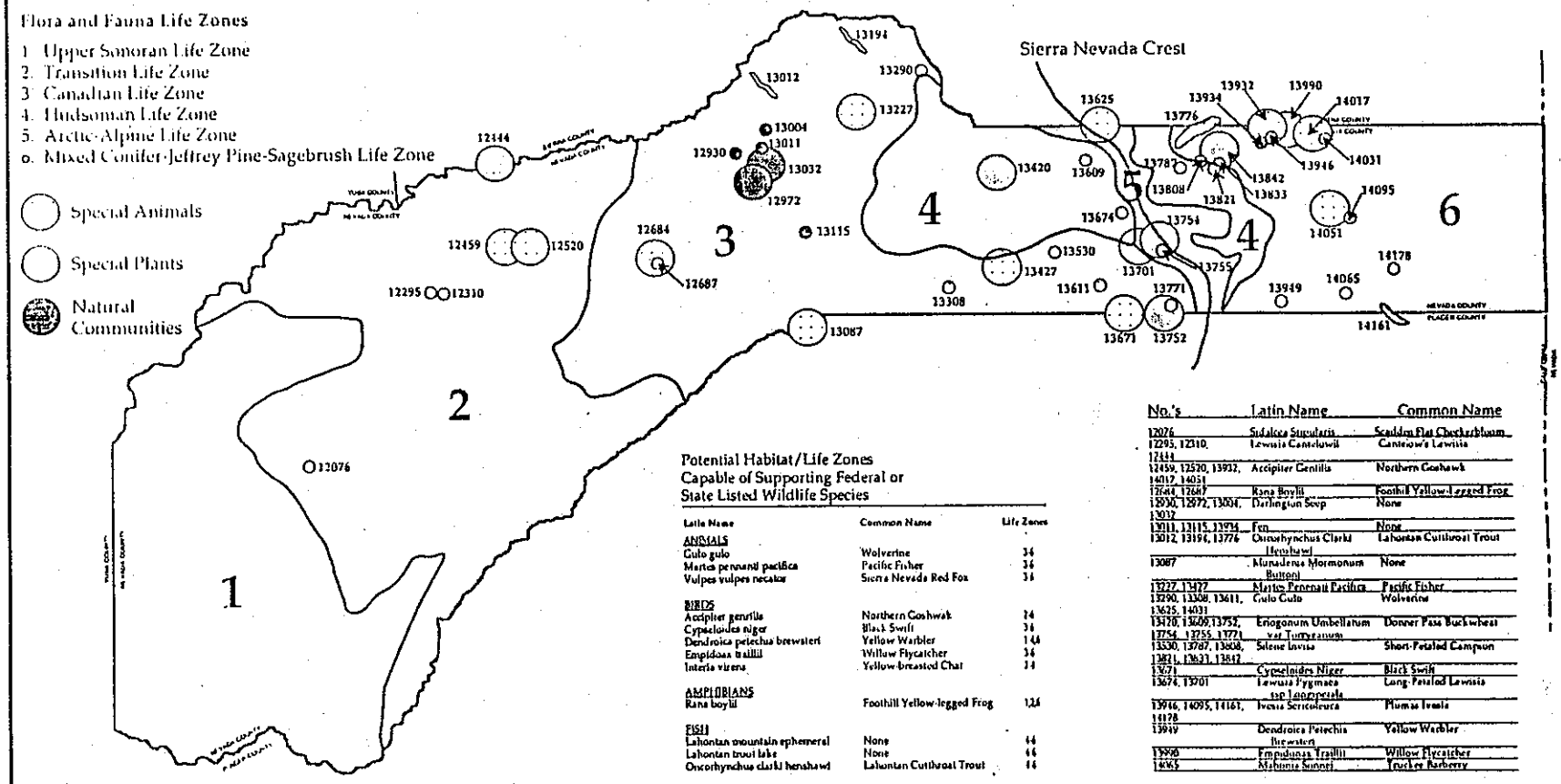
The gradual decline of hardwood habitats in the county will result in a commensurate reduction in habitat values.

Stream And Riparian Corridors

As shown in Figure 6, Nevada County is a veritable network of intermittent (seasonal) and perennial (year round) creeks, streams and rivers.

These waterways are critical habitats in their own right, as well as providing important movement, fishing values and corridors for wildlife. These waterways range from the South Yuba River to small unnamed seasonal drainages. Yet, despite their varied characteristics, these areas provide important year round and migratory habitats. The trees and shrubs which grow in the corridors provide shelter, forage, and nesting values, as well as drinking water and habitat for water dependent amphibians, mammals and birds.

Riparian corridors in the county have been disrupted as a result of agricultural operations, logging activities, domestic water development, residential development, water pollution, hydroelectric facilities and other improvement activities. The quality of individual corridors relates to the vegetative cover, the width of the undisturbed corridor, the microclimate conditions, proximity to development, and a variety of factors.



Potential Habitat/Life Zones Capable of Supporting Federal or State Listed Wildlife Species

Latin Name	Common Name	Life Zones
ANIMALS		
Gulo gulo	Wolverine	3,6
Martes pennanti pacifica	Pacific Fisher	3,6
Vulpes vulpes necator	Sierra Nevada Red Fox	3,6
BIRDS		
Accipiter gentilis	Northern Goshawk	3,4
Cypseloides niger	Black Swift	3,6
Dendroica petechia brewsteri	Yellow Warbler	1,4,6
Empidonax traillii	Willow Flycatcher	3,6
Icteria virens	Yellow-breasted Chat	3,4
AMPHIBIANS		
Rana boylii	Foothill Yellow-legged Frog	1,2,6
FISH		
Lahontan mountain ephemeral	None	4,6
Lahontan trout lake	None	4,6
Oncorhynchus clarki henshawi	Lahontan Cutthroat Trout	4,6

No.'s	Latin Name	Common Name
12076	Sidalcea Stipularis	Scadden Flat Checkerbloom
12295, 12310, 12444	Lewisia Cantelowii	Cantelow's Lewisia
12459, 12520, 13932, 14017, 14051	Accipiter Gentilis	Northern Goshawk
12684, 12687	Rana Boylii	Foothill Yellow-Legged Frog
12930, 12972, 13004, 13032	Darlingtion Scop	None
13011, 13115, 13934	Fen	None
13012, 13194, 13776	Oncorhynchus Clarki Henshawi	Lahontan Cutthroat Trout
13087	Mimuleuus Mormonum Button)	None
13227, 13472	Martes Pennanti Pacifica	Pacific Fisher
13290, 13308, 13611, 13625, 14031	Gulo Gulo	Wolverine
13420, 13609, 13752, 13754, 13755, 13771	Eriogonum Umbellatum var Torreyanum	Donner Pass Buckwheat
13530, 13787, 13808, 13821, 13833, 13842	Silene Invisa	Short-Petaled Campion
13671	Cypseloides Niger	Black Swift
13674, 13701	Lewisia Pygmaea ssp Leeopetala	Long-Petaled Lewisia
13946, 14095, 14161, 14178	Ivesia Sericoleuca	Plumas Ivesia
13949	Dendroica Petechia Brewsteri	Yellow Warbler
13990	Empidonax Traillii	Willow Flycatcher
14065	Mahonia Sonnei	Truckee Barberry

Source: California Department of Fish and Game, 1991.

Harland Bartholomew & Associates, Inc
Sacramento California

NEVADA COUNTY GENERAL PLAN
Special Status Species

Figure 7

However, even apparently degraded areas can retain value, as can corridors traversing developed areas. Riparian corridors can provide important habitats and linkages between rural areas for wildlife.

Special Status Species

Special status species are those plants or animals which are recognized by the DFG or the U.S. Fish and Wildlife Service (USFWS) as being rare, endangered, or threatened. Generally, animals are considered to be endangered if one of the following characteristics applies:

1. Mortality rate exceeds birth rate.
2. Is incapable of adapting to environmental change (intolerant).
3. Habitat is threatened by serious disturbance.
4. Survival is threatened by introduction of unwanted species.
5. Environmental pollution threatens survival.

An animal is defined as "rare" if any one of the following characteristics apply:

1. Confined to a small specialized habitat and incapable of change.
2. Nowhere abundant.
3. So limited that any appreciable reduction would cause it to be endangered.
4. If current management programs were stopped, would become endangered.

Known special status animals, plants, birds, amphibians, and fish located within Nevada County are as follows respectively: wolverine, Pacific fisher, Sierra Nevada red fox, pine marten, and snowshoe hare; scadden flat checkbloom, Cantelow's lewisia, Donner Pass Buckwheat, short-petaled campion, long-petaled lewisia, Plumas ivesia, and Truckee barberry; northern goshawk, black swift, yellow warbler, willow flycatcher, yellow-breasted chat, russet-backed thrush, spotted owl; foothill yellow-legged frog, red-legged frog; and Lahontan cutthroat trout.

Figure 7 presents the known locations of rare plants and animals in the County. There is a high potential that special status species exist in areas not yet officially mapped, as the majority of the county has not been systematically surveyed and studied. Much of the known mapping is the result of field surveys prepared for specific development projects.

The list of plants located within Nevada County considered by the California Native Plant Society (CNPS) to be threatened is presented in *Appendix B of the Nevada County Master Environmental Inventory*. This list is more extensive than the federal and state listing as these are species which the CNPS considers to be at risk which have not been listed by either the Federal or State governments.

It is probable that the overall trend in the county toward a decline in habitat values could result in an increase in plant and animal species gaining formal listing as endangered, rare, or threatened. Additionally, without ongoing management and monitoring, species in the County that are currently listed as endangered, rare, or threatened could become extinct in the County.

Open Space

Open space can serve a variety of purposes. It can be used as the focal point of a community in the form of local and regional parks or as a means of preserving significant features in the area. In order to use open space in community design, it must first be recognized. Once recognized, it should be incorporated into programs for the preservation of natural resources, managed for the production of resources, used for outdoor recreation, and set aside, where appropriate, for public health and safety.

Open Space for the Preservation of Natural Resources

These areas should include lands for the preservation of plant and animal life including habitat for fish and wildlife species. Protective corridors are recommended along all major streams in the planning area as a means to eliminate the encroachment of development in these environmentally sensitive areas. These corridors will also help to preserve the water quality of major waterways.

The highest values for resident wildlife in the County generally occur in areas which have not yet been disturbed by development. Within the County, resident wildlife values have been significantly degraded as a result of urbanization, parcelization and the direct and indirect effects of human activities. The areas of the county which are still in large-parcel, undeveloped acreage generally represent the more valuable habitat areas simply due to their essentially open space and low density land uses, although the values vary locally with density and diversity varying in response to local vegetational characteristics. Animals which do not migrate, but which move throughout a home range can be severely affected by development within their range, especially those species which are less tolerant of human activity or are dependent on specific habitat characteristics which are altered by development.

Open Space for Managed Resource Production

Agricultural Land

Agricultural resources in the planning area are abundant. From one-half acre plots of specialized vegetables to cow/calf operations and timber stands on hundreds of acres, Nevada County supports all types of agricultural pursuits. Agriculture in the county is a mosaic of residential neighborhoods with intermingled farmland. This land provides marketable products, open space, wildlife habitat, watershed and an aesthetic environment. Farms and farmland have the unique ability to provide all these amenities at the same time and still remain a viable economic alternative to the owners or tenants.

About one-third of the land within the boundaries of the TNF is private, or in non-federal ownership. The majority of these ownerships are small (less than 1,500 acres). Development pressures will continue to increase on the intermingled private lands. More residential use will likely intensify conflicts with resource management on the TNF lands and create "Urban/Rural Wildland Interface" conflicts. As more private lands are developed, demand will increase for roads, water systems, utilities, and other services on TNF lands. Utility companies feel there is a need for additional utility corridors to transport power from the east. Additionally, within the urban/rural wildland interface there is a continuing demand for timber, as well as a visually pleasing natural environment.

Mineral Resources

Mineral resources, particularly gold, have played a major role in the history of Nevada County. Since 1849, when gold was first discovered in the area, to the years preceding World War II, most of the County's population was economically supported, directly or indirectly, by the local gold mining industry. Other metals produced in the County since 1880 include silver, copper, lead, zinc, chromite, and small amounts of tungsten and manganese. Industrial minerals include barite, quartz for silicon production, and small amounts of limestone, asbestos, clay, and mineral paint. Also, significant deposits of sand, gravel, and rock types suitable for construction aggregate are exposed throughout the County. (Mineral Land Classification of Nevada County, State Division of Mines and Geology, 1990).

In order to promote the conservation of the state's mineral resources, and ensure adequate reclamation of mined lands, the Surface Mining and Reclamation Act of 1975 (SMARA) was enacted. SMARA requires that the State Geologist classify land in California for its mineral resource potential. Local governments are required to incorporate the mineral and classification reports and maps into their general plans and consider the information when making land use decisions.

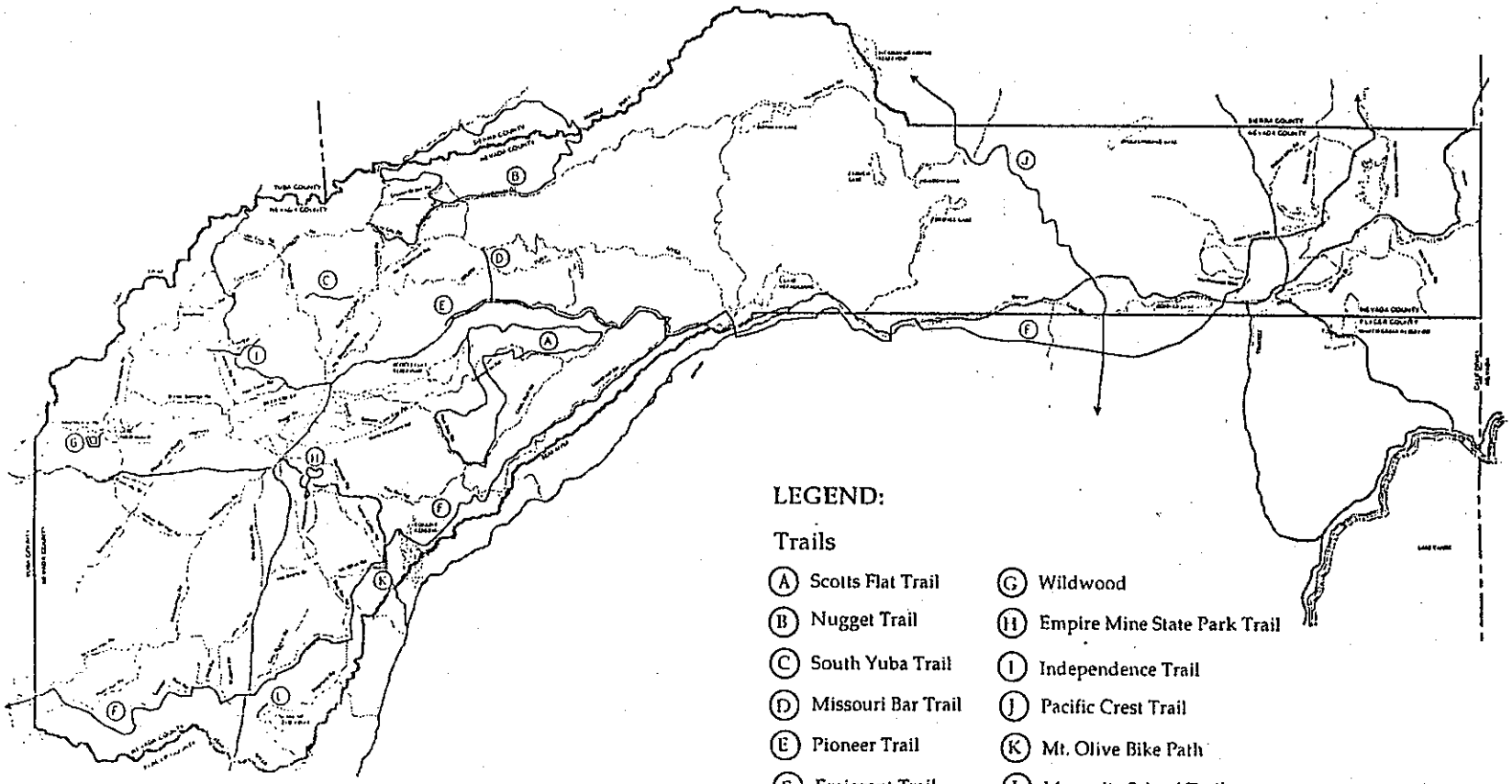
Areas subject to mineral land classification studies are divided into various Mineral Resource Zone (MRZ) categories that reflect varying degrees of mineral potential. Figure 8 indicates areas which are classified by the State Geologist as areas of identified mineral resource significance. Areas classified MRZ-2 are those containing potentially significant mineral deposits. The existence of deposits may be actually measured or indicated by site data (MRZ-2a), or inferred from other sources (MRZ-2b). All areas within Nevada County classified by the State Division of Mines and Geology as MRZ-2 are shown on the General Plan Land Use Maps included in Volume 1 of the Nevada County General Plan.

Open Space for Recreation

Scenic Routes

Nevada County is blessed with a wide variety of landscapes and scenic resources which provide passive recreational opportunities for residents and visitors alike. Chief among these scenic resources are the views available from many roadways to surrounding open areas as well as to vistas of the foothills and mountains. Scenic routes should be protected from development which could destroy the scenic quality along the corridor. Scenic routes include:

LEGEND:
Areas Classified MRZ-2a and MRZ-2b
For All Mineral Resources
Source: California State Geologist, 1991.
Harland Bartholomew & Associates, Inc
NEVADA COUNTY GENERAL PLAN
Mineral Land Classification Map
(Areas Containing Potentially Significant Mineral Deposits)
Figure 8



Source: Draft Regional Transportation Plan, Nevada County, 1990.

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Sacramento, California

NEVADA COUNTY GENERAL PLAN
Non-Motorized Trails

Figure 9

- **Interstate 80 and Highways 49 , 89, 174, and 267** for their entire length in the county;
- **Highway 20** from Highway 49 to Interstate 80;
- **Donner Pass Road** (Old Highway 40) from the Interstate 80 intersection at Soda Springs to Donner State Memorial Park.

Bikeway /Pedestrian/Equestrian Corridors

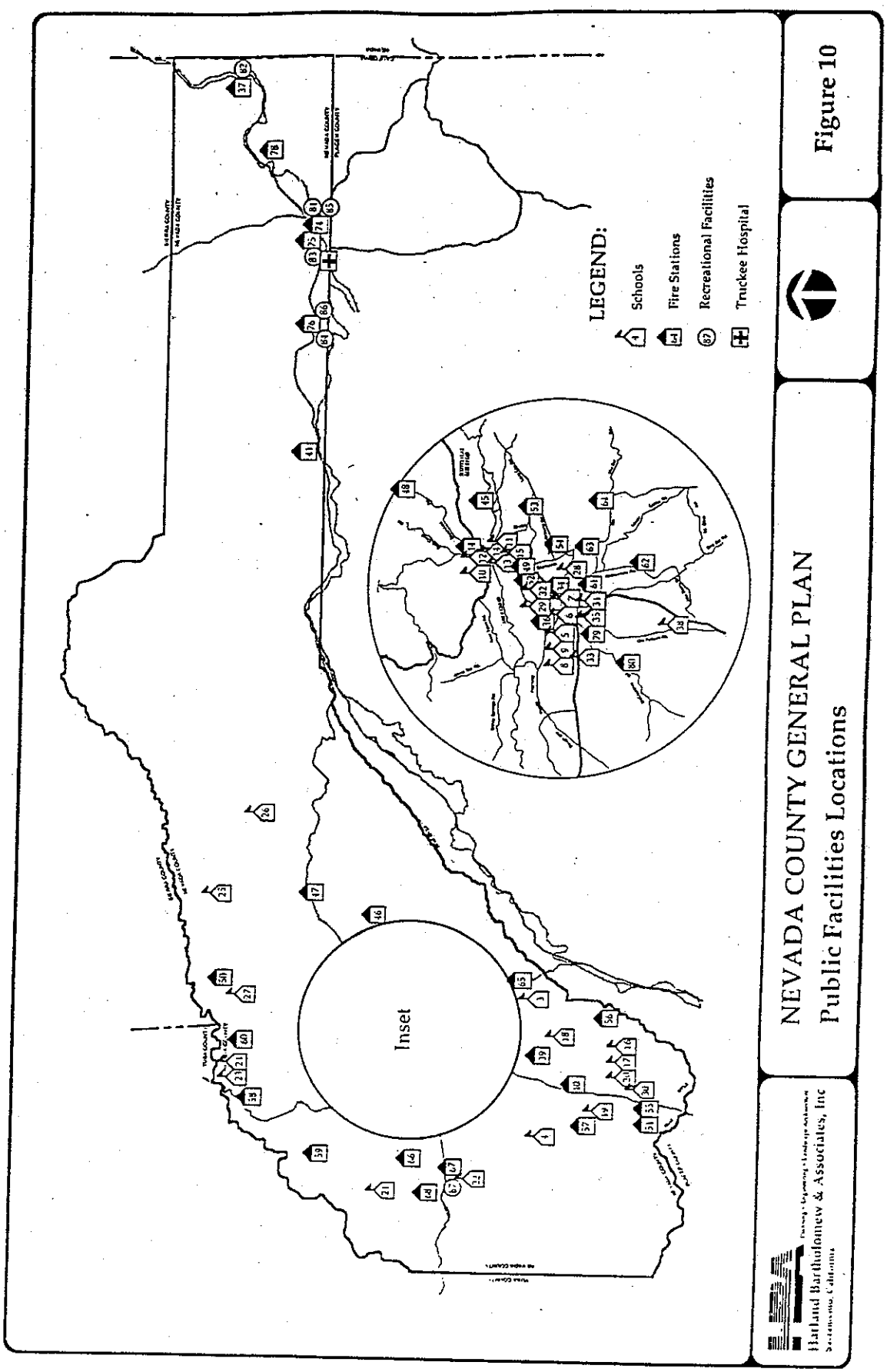
The number of existing bicycle, pedestrian, and equestrian trails in Nevada County is limited. Figure 9 displays the non-auto trails within Nevada County which are either complete or partially complete. These trails are oriented toward recreational use and do not provide logical connection for non-auto transportation within the urbanized areas of Nevada County. A brief description of each trail is given below:

- **Scott's Flat Trail** is a 50 mile trail that crosses both Forest Service and private property. It serves Upper Burlington Ridge, Deer Creek, Forebay, Indian Springs and Towle Mill.
- **Nugget Trail** is approximately 50 miles at the Sierra County Line. It also crosses both Forest Service and private property.
- **South Yuba Trail** begins at the South Yuba Recreation Area and extends approximately 5 miles to campgrounds.
- **Missouri Bar Trail** extends north of Highway 20 across the South Yuba River.
- **Pioneer Trail** parallels Highway 20 east of Nevada City. Approximately 15 miles are complete, with plans for an extension to the Pacific Crest Trail by 1993.
- **Emigrant Trail** is a historic trail of regional significance extending through the entire County.
- **Wildwood** is a proposed equestrian center and trail system of approximately 25 miles near Lake Wildwood.
- **Empire Mine State Park** is a trail of approximately 10 miles off Highway 49 in Grass Valley.
- **Independence Trail** is a two-mile trail adjacent to Highway 49 north of Nevada City designed for handicapped and wheelchairs.
- **Pacific Crest Trail** is a north-south trail extending from Canada to Mexico through the eastern portion of the County.
- **Mount Olive Bike Path** is a Class I path adjacent to Mount Olive Road adjacent to Lower Colfax Road.
- **Magnolia School Trail** is a short path that serves Magnolia School students along Magnolia Road.

The 1989 Nevada County Master Bicycle Plan includes bike lanes within the urbanized areas of the County that improve non-auto access and mobility. Further, to improve pedestrian travel, the County has applied its non-auto TDA funds entirely to sidewalk construction in Nevada City, Grass Valley, Truckee, and urban unincorporated areas.

Park and Recreation Districts

There are three recreation and park districts in Nevada County: Western Gateway Regional and Bear River in western County and Truckee Donner in eastern County.


LEGEND:
Schools
Fire Stations
Recreational Facilities
Truckee Hospital
Inset
NEVADA COUNTY GENERAL PLAN
Public Facilities Locations
Figure 10
Barland Bartholomew & Associates, Inc

Nevada County owns no recreation land other than the Western Gateway Park site in Penn Valley, which is leased to the Western Gateway Park District, and the County does not operate any recreation facilities. However, the County does collect Quimby Act fees on new subdivision lots and distributes those fees to the cities, to existing park and recreation districts, to specific community recreational facilities, or to school districts for enhanced recreational opportunities.

Western Gateway Park is a large park offering a variety of recreational facilities. Truckee Donner operates a number of park and recreational facilities, primarily within the Town of Truckee. Bear River is a new District and currently operates the Magnolia Sports Complex in conjunction with the Pleasant Ridge School District.

Public Lands

There are several public land ownerships that cover a significant amount of the County's total land area. In addition to the County of Nevada, the State of California, and the United States Forest Service, the Bureau of Land Management (BLM) also has ownership within Nevada County. BLM is responsible for administering public lands and resources following the principles of multiple use and sustained yield set down by Congress in the landmark 1976 Federal Land Policy and Management Act.

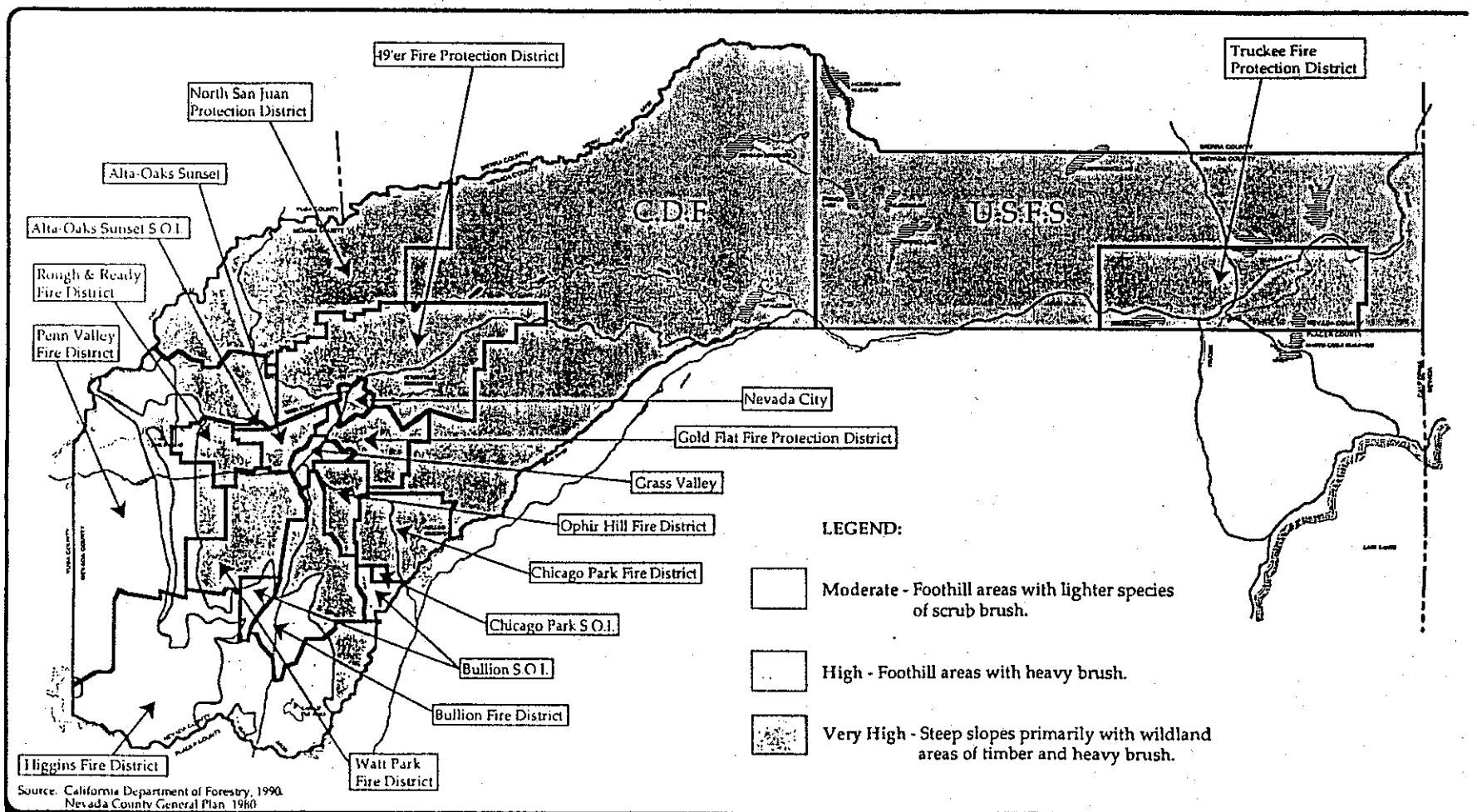
The County lands are located in and around the City of Grass Valley. State lands are concentrated in three areas: (1) the Spenceville Wildlife Management and Recreation Area; (2) Malakoff Diggins State Historical Park; and (3) a small area southeast of Grass Valley. National forest lands are located along the county's northern border, throughout the San Juan Ridge and Chalk Bluff Ridge and due east towards the California-Nevada state line. The major areas administered by BLM are located within the South Yuba River Recreation Lands; north from Rollins Reservoir to Poore Mine and east to Deadman's Flat; west from the South Yuba River Recreation Lands to Bridgeport; and south from Rough and Ready to Ranch Hill. Smaller areas of BLM lands are located along the western and southern borders; south of Grass Valley; and pocket areas around Nevada City and in Willow Valley.

The Tahoe National Forest covers approximately 169,000 acres or 264 square miles of land in Nevada County. The Toiyabe National Forest covers 2,600 acres in eastern County. The Spenceville Wildlife and Recreation Area contains 11,000 acres or 17 square miles, with half the tract in Nevada County and the other half in Yuba County. The Bureau of Land Management has some 11,000 acres of land in Nevada County. These areas cover a total of 294 square miles (or 30%) of the County's 978 square miles.

Open Space for Health and Safety

Fire Hazard

As demonstrated by the 49'er Fire of 1988, Nevada County has a high potential for wildland fires of devastating intensity. Based on a "Fire Hazard Severity Zone" map developed by the California Department of Forestry (CDF), almost all of



Source: California Department of Forestry, 1990.
Nevada County General Plan, 1980

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Sacramento, California

NEVADA COUNTY GENERAL PLAN

Fire Hazard Zones and Fire Districts

Figure 11

Nevada County has been placed in the "very high" category of severity. Figure 11 displays the hazard severity zones and fire district boundaries. Fire protection service provided by Fire Districts does not include wildland areas. The U.S. Tahoe National Forest Service and CDF provide fire protection for the wildland areas, and are legally responsible only for wildland fires - not structural fires - during the fire season. Therefore, as shown on Figure 11, most of the County does not have year-round fire protection. In addition, most of these districts are manpowered with volunteers, making it difficult to coordinate with other agencies.

There are several factors that influence the potential for fire hazard including population growth, vegetation and slope, and weather.

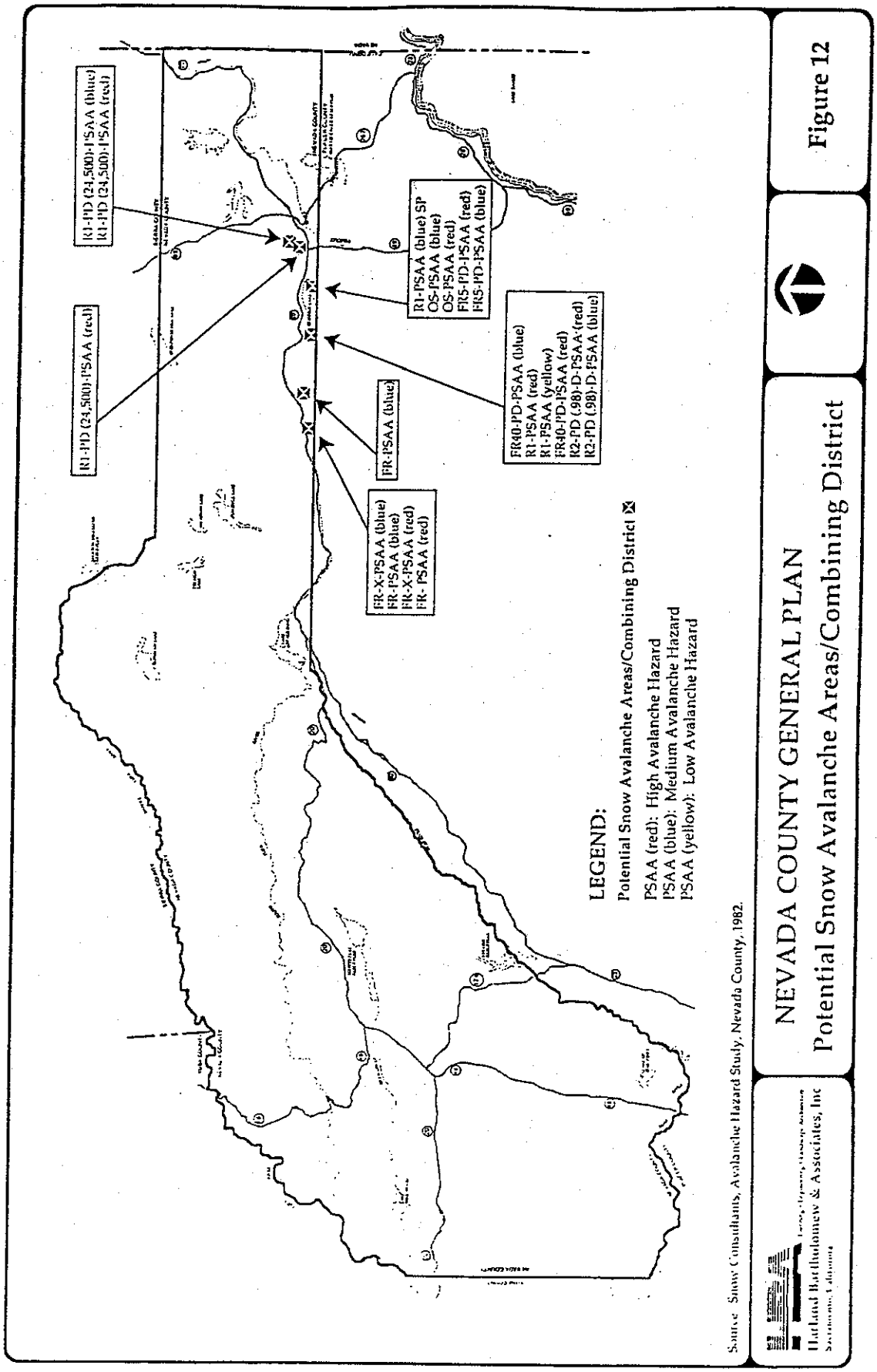
The California Department of Forestry has stated that, "The rapid population increase of the County continues to compound the potential for wildfires with each fire season. This fact must be impressed upon the residents living in the wildlands and to those charged with providing life and property protection to the populous." The 49'er Fire proved this statement to be true. The main problem encountered during this disastrous fire was the lack of adequate ingress and egress routes to the residential areas. The State Responsibility Area Fire Safe Regulations cover "basic wildland fire protection standards of the California Board of Forestry" for "future design and construction." These new standards and regulations do not apply to existing structures, roads, streets, and private lanes or facilities. According to the Office of Emergency Services (OES), there are no regulations that apply to existing conditions.

According to the "Be Fire Safe" guidelines, vegetative areas generally over 8 percent in slope are defined as fire hazardous. Basically, the steeper the slope the faster the fire climbs. The California Department of Forestry has categorized vegetation based on fuel burning, or "fuel loading" characteristics. These are as follows:

- Light - flammable grass and annual herbs;
- Medium - scrub brush of lighter species; and
- Heavy - timber, woodland, and heavier brush species.

Weather also plays a critical role in determining fire hazard. According to the California Department of Forestry, summers with little precipitation and low relative humidity dry out vegetation which increases the amount of fuel available for burning. The drying winds of the winter months also contribute to fire hazard in Nevada County (OES).

The need for fire protection services to protect life and property will increase with development on private lands. Often such pockets of development are at a great distance from TNF or CDF fire stations or are difficult to access because of narrow roads or steep and winding access routes. As a result, the demand for additional fire protection districts is likely to increase with development on private land within the TNF. The TNF, in its 1990 Land and Resource Management Plan, identified the need for cooperation with local, State and Federal agencies to appropriately plan for the urban/rural wildland interface.


R1-PD (24,500)-PSAA (blue)
R1-PD (24,500)-PSAA (red)
R1-PD (24,500)-PSAA (red)
R1-PSAA (blue) SP
OS-PSAA (blue)
OS-PSAA (red)
FR5-PD-PSAA (red)
FR5-PD-PSAA (blue)
FR40-PD-PSAA (blue)
R1-PSAA (red)
R1-PSAA (yellow)
FR40-PD-PSAA (red)
R2-PD (.98)-D-PSAA (red)
R2-PD (.98)-D-PSAA (blue)
FR-PSAA (blue)
FR-X-PSAA (blue)
FR-PSAA (blue)
FR-X-PSAA (red)
FR- PSAA (red)
LEGEND:
Potential Snow Avalanche Areas/Combining District
PSAA (red): High Avalanche Hazard
PSAA (blue): Medium Avalanche Hazard
PSAA (yellow): Low Avalanche Hazard
Source: Snow Consultants, Avalanche Hazard Study, Nevada County, 1982.
NEVADA COUNTY GENERAL PLAN
Potential Snow Avalanche Areas/Combining District
Figure 12

Avalanche Hazard

Avalanche hazard areas are generally located on high, mountainous slopes and terrain at elevations above 7,000 feet. The location of avalanche hazard areas depends upon the location of snow accumulation areas - those areas where snow tends to drift during peak winter storms. Wind velocity and the density of vegetation determine the pattern of snow drift and accumulation. In general, snow drifts from areas of low, or no vegetation to areas such as woodland terrain, where the wind is less able to exert its influence. The most important factor necessary to release an avalanche is heavy snow fall. A rapidly increasing snow layer is unable to stabilize or bond with the old layer of snow or the ground below it, so that after a certain amount of time the new snow layer will simply slide off as an avalanche. Hazard zones are classified according to the following criteria:

Red Zones (high hazard): Areas where avalanches that could damage standard wood-frame structures and/or bury automobiles are expected to occur with a probability of one chance in twenty per year;

Blue Zones (moderate hazard): Areas where avalanches that could damage standard wood-frame structures and/or bury automobiles are expected to occur with a probability of less than one chance in twenty per year, but more than one chance in one hundred per year;

Yellow Zones (low hazard): Areas where avalanches that could damage standard wood-frame structures and/or bury automobiles are expected to occur with a probability of less than one chance in one hundred per year; and

White Zones (no hazard): Areas where, barring cataclysmic or unprecedented events, avalanches will not occur (Wilson).

In 1982, Snow Consultant Services prepared a study that identified avalanche hazard areas within Nevada County. The areas include portions of the Donner Lake, Tahoe-Donner, and Soda Springs areas (see Figure 12). These hazard areas are currently populated, subdivided, or where domestic or commercial uses are planned (ski areas are not included). The mapping does not include areas where people would likely travel by foot, snowshoes, skis, or snowmobile (i.e. back country or roadless areas).

Landslide Hazard

The geologic properties of slope forming materials are a primary factor determining the stability of a slope. Although slope movements can occur in any type of rock material, certain bedrock formations exhibit a high susceptibility to such movement. Cenozoic Volcanic, which is found in the central portion of the County, is a form of this bedrock type. However, most of the County's soils are underlain with dense bedrock formations and lack the characteristics contributing to landslide susceptibility. There are however, other factors such as steep topography, past hydraulic mining, and large amounts of precipitation (as in 1982 and 1983) that create the potential for landslide activity.

Historic Hydraulic Mining. According to the Soil Conservation Service, any area adjacent to a hydraulically mined area is subject to landslide activity. The mining removes the toe of the slope resulting in slope instability uphill or upstream. Triggering devices such as an earthquake or heavy rainfall would set a slide in motion.

There are many hydraulic mining sites within Nevada County. East of Nevada City, an area of over 20,000 acres contains the majority of these sites.

Some of the largest mining sites in Nevada County are listed below:

- Malakoff Diggings, North Bloomfield area;
- Montezuma Hill, Nevada City;
- Chalk Bluff, You Bet/Red Dog area;
- North San Juan; and
- French Corral

In 1982, Nevada County experienced 100 inches of precipitation and in the following year, received 90 inches. According to the Soil Conservation Service, every landslide that occurred during those periods was adjacent to a hydraulic mine site. Mapping of these areas was unavailable.

Reactivation of Inactive Slides. After movement most landslides attain a degree of stability, but a landslide reacts with remarkable sensitivity to changes brought on by nature and man. Equilibrium can be upset by increasing the driving force (i.e. overloading the head of the slide) or by decreasing the resisting force (i.e. removing support from in front of the slide -the toe). This is apparent every winter by road maintenance crews who remove the toe of a fresh slide from the highway only to leave the slide in a poised and precarious state for the next triggering rain. The same is true where new roads are constructed across the toe of an old inactive slide; or where grading on a residential tract is completed with satisfactory precautions, only to have grading during utility, sidewalk, house or yard construction remove toe support from a creep or slide area (U.S.D.A Soil Conservation Service).

Triggering devices such as water, ground shaking, and grading activities are not the basic causes that create the unstable condition and determine the dimension of the slide. Rather, it is the effect of these triggering devices on the basic environmental conditions; the relationship of rock type and geologic structure to, most importantly, slope height and slope angle.

Open Space Action Program

The Nevada County Open Space Action Program includes carrying out policies which will contribute to the preservation of open space, including open space for preservation of natural resources; for the managed production of resources; outdoor recreation; and public health and safety. These policies as contained in Sections 2 and 3 of Volume 1 of the Nevada County General Plan, address open space preservation both in the context of community development (Section 2 of Volume 1) and in the context of resource conservation and development (Section 3 of Volume 1). The policies, as summarized below, include both **directive policies** which guide activities and decisions concerning future development, and **action policies** which mandate specific actions to implement the General Plan. The Action Program also includes implementation measures which carry out action policies related to open space. These measures, as summarized below, are contained in Section 4 of Volume 1 of the Nevada County General Plan.

Open Space Policies

Policies which are relevant to the Nevada County Open Space Program are found in **Chapter 6: Open Space,** of Volume 1 of the Nevada County General Plan, and supporting policies related to the Open Space Program are found in other Chapters of both **Section 2: Community Development** and **Section 3: Resource Conservation and Development**, of the General Plan. The policies contained in Chapter 6, as well as key supporting policies from other chapters of the General Plan are summarized below, and references provided to the number of the policy cited.

Open Space Policies

Policy 6.1 *Use of the Open Space land use designation, which is intended to provide for land which is either in public ownership, or permanently preserved as open space through easements or other restrictive mechanisms, with uses limited to those which have minimal impact on the natural character and environmental features of the land.*

Policy 6.2 *Utilization of clustering of development to preserve open space within the Rural Regions which will enhance visual, habitat and other open space values and which may be permanently secured and preserved as open space through permanent easements, dedication to a public agency, permanent trust or other irrevocable means.*

Policy 6.3 *Maintaining the density of development allowed in the Rural and Forest land use designations to provide for low density development in Rural Regions which preserves an open, rural character and complements the permanent public and private open space.*

Policy 6.4 *Protecting areas supporting renewable natural resources from incompatible or disruptive development or land uses through very low density General Plan designations such as: high site and public timber resources designated at a 160 acre minimum parcel size or greater, except for areas of fragmented parcelization; and identified lakes and reservoirs designated as water areas in the General Plan.*

Policy 6.5 *Within all Village and Rural Centers, as well as multi-family, commercial, business park and industrial development, requiring that appropriate areas be provided for urban open space in with recreational use of the open space designed to minimize impact on sensitive environmental and/or biological values.*

Policy 6.6 *Providing for, where feasible, continued access to open space and public resources by ensuring that all discretionary projects are consistent with development of the Nevada County Non-Motorized Trails Master Plan.*

Policy 6.7 *Encouraging the location and development of motorized off-road facilities on lands where such use can be accommodated.*

Policy 6.8 *Encouraging local recreation and park districts or other entities to obtain open spaces (on environmentally constrained lots or land, lots with relatively low construction potential) and neighborhood parks within existing residential subdivisions and areas.*

Policy 6.9 *Establishing development standards for project design, grading, construction and use of all discretionary project to determine open space requirements for each project, with consideration of non-disturbance of, and open space setbacks from identified sensitive environmental, biological, or cultural resources.*

Key Supporting Policies

Policy 1.12 *Encouraging clustering in subdivisions in Rural land use designations to support grazing, forest management and crop production.*

Policy 1.17 *Adopting site development standards for all development projects which identify basic requirements for the provision of open space as part of site development.*

Policies 1.18 and 13.1 — *Encouraging cluster development to maintain the open, pastoral development in Rural Regions and to protect environmental features, with clustering required where significant environmental constraints are present.*

Policies 3.8 and 3.10 — *Adopting a comprehensive development impact fee program applicable to County parks, with a standard of 3.0 acres of regional park land for each additional 1,000 persons in the county-wide population.*

Policy 5.1 — *Focusing upon regional facilities in the development of the County park system, with inclusion of open space for environmentally sensitive areas.*

Policy 5.5 — *Encouraging the provision of linear parks or greenways within Community Regions including potential linkages to the county-wide trail system.*

Policy 5.7 — *Preparing an updated Master Parks and Recreation Plan.*

Policy 5.14 — *Providing a county incentive program which encourages retention of private open space.*

Policy 5.17 — *Implementing the county Non-Motorized Multi-Purpose Trails Master Plan.*

Policy 5.21 — *Recognizing the South Yuba River canyon as an important resource by designating publicly owned lands along the river as open space and encouraging the recreation master planning and development activities by the State Department of Parks and Recreation.*

Policy 10.6 — *Maintaining low density rural and forest land use designations in areas which have a high fire hazard and/or lack adequate year-round fire protection facilities.*

Policy 11.8 — *Utilizing voluntary clustering of development to preserve stream corridors, riparian habitat, wetlands and floodplains.*

Policy 11.9 — *Maintaining the low densities of development in rural and forest land use designations to protect existing watersheds.*

Policy 13.8 — *Including measures in the county site development standards to minimize disturbance of heritage and landmark trees and groves, which may include clustering of development.*

Policy 15.1 — *Maintaining a low density of allowable development in the forest land use designation to protect potential timber resources from conversion to more intensive uses.*

Policy 15.3 *Encouraging clustering of development in timberland areas in rural and forest land use designations to preserve timber resources for productive use.*

Policy 16.1 *Strongly encouraging agriculture in rural regions and allowing agriculture in community regions*

Policy 16.4 *Maintaining existing agricultural zoning on land in rural land use designations to allow for continuation of existing agricultural operations, as well as potential new agricultural operations.*

Policy 16.7 *Supporting efforts by private conservation organizations to utilize voluntary conservation easements to preserve agricultural land.*

Policy 16.13 *Continuing participation in the Williamson Act program.*

Open Space Implementation Measures

Implementation measures which are relevant to the Nevada County Open Space Program are found in **Section 4: Implementation Measures**, of Volume 1 of the Nevada County General Plan. These measures, with a reference to the number of the implementation measure as it appears in Section 4 of Volume 1, are summarized below, including a brief description of the implementing action and the purpose as it relates to the Open Space Action Program.

IMPLEMENTATION MEASURE 1: **PREPARE AND ADOPT COMPREHENSIVE SITE DEVELOPMENT STANDARDS**

Action: *Prepare and adopt a comprehensive set of site development standards to be used in project review; amend zoning ordinance to require application of standards for review of all discretionary development projects, and of ministerial project where applicable.*

Purpose: *Provide for review of development projects to ensure basic requirements for site development , including provision of open space, are met.*

IMPLEMENTATION MEASURE 2: **ADOPT CLUSTERING PROVISIONS**

Action: *Amend Zoning Ordinance to encourage clustering where natural constraints are present.*

Purpose: *To provide a mechanism for preservation of natural resources, environmentally sensitive areas and the rural character of the County while maintaining reasonable expectations for development of private property.*

IMPLEMENTATION MEASURE 3: AMEND ZONING REGULATIONS AND ZONING DISTRICT MAPS

Action: *Adopt amended zoning regulations and zoning district maps, which are consistent with the General Plan.*

Purpose: *To implement the General Plan land use designations, including Open Space, Rural and Forest designations which contribute to the preservation of open space.*

IMPLEMENTATION MEASURE 11: IMPACT FEE PROGRAM

Action: *Adoption of an Impact Fee Program for County Facilities including Roads, Parks, bicycle and pedestrian facilities, and Public Buildings*

Purpose: *Assure the completion of a comprehensive development fee program meeting the requirements of AB 1600 and SB 327, including the acquisition of regional park land.*

IMPLEMENTATION MEASURE 20: PARKS AND RECREATION MASTER PLAN

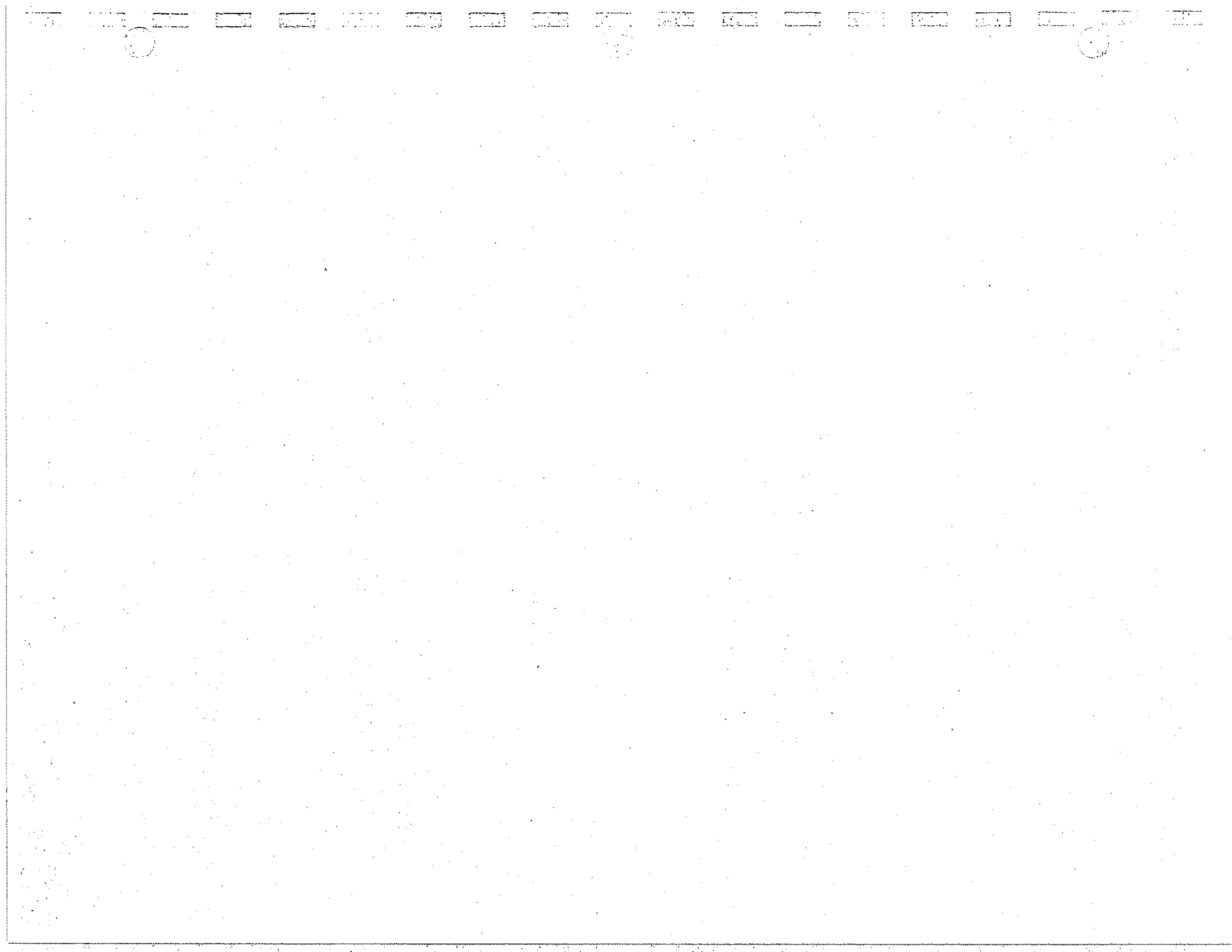
Action: *Preparation and adoption of an updated Parks and Recreation Master Plan.*

Purpose: *Assure preparation of a Parks and Recreation Master Plan, which would include potential open space acquisition as part of the development of regional parks in the county system.*

Nevada County General Plan

Volume 2: Background Data and Analysis

Section 5: Resources Capability Analysis



Resources Capability Analysis

Introduction

This analysis is intended to assist in the update of the Nevada County General Plan by evaluating capabilities and constraints for the proposed General Plan land use designations. The analysis of capabilities and constraints for the proposed designations is based upon previously completed work for the General Plan Update, and summarizes key information, conclusions and implications for the following 12 topic areas: mineral resources, agricultural land, steep slopes/high erosion hazard, soil capability, flood hazard, special status species, wildlife habitat, migratory deer ranges, riparian corridors, wetlands, timberlands, and fire hazard zones. Information and conclusions contained in this document were drawn from the Nevada County Master Environmental Inventory (MEI), the Nevada County Open Space/Conservation Inventory (Nevada County General Plan Administrative Draft, Volume 2, December 1992), the Mineral Land Classification of Nevada County, California (1990), and the Nevada County General Plan Administrative Draft, Volume 1, December 1992. These documents can be referred to for additional information concerning particular topic areas. Additional information was drawn from other data compiled during the General Plan Update, including the Nevada County Important Farmland Map (1990), land use field maps, and County parcel maps.

The order in which the topic areas are discussed is not based upon prioritization or order of importance. Planning is a value-driven process, and while development should recognize the influence of individual constraints, consistency with the community's values as expressed in the Central Themes and Concepts is also of primary concern.

The following sections are organized by topic to present a definition of the constraint and basis for its evaluation; its overall scope and impact in relation to the proposed General Plan; and compliance of the proposed General Plan with the identified constraint.

Significant Mineral Resources

Constraint Defined

In order to promote the conservation of the state's mineral resources, and ensure adequate reclamation of mined lands, the California Surface Mining and

Reclamation Act of 1975 (SMARA) was enacted. SMARA requires the State Geologist to classify land, without regard to land use, according to the presence or absence of significant mineral deposits. Areas subject to mineral land classification studies are divided into various Mineral Resource Zone (MRZ) categories that reflect varying degrees of mineral potential. Areas classified MRZ-2 are those containing significant mineral deposits (see Figure 8 of the Nevada County Open Space/Conservation Inventory). The existence of deposits may be actually measured or indicated by site data (MRZ-2a), or inferred from other sources (MRZ-2b).

Mineral resources in Nevada County include gold, copper, silver, lead, zinc, chromite, and small amounts of tungsten and manganese. Industrial minerals include barite, quartz for silicon production, and small amounts of limestone , asbestos, clay, and mineral paint. Also, significant deposits of sand, gravel, and rock types suitable for construction aggregate are exposed throughout the County.

Extent of Constraint

In western Nevada County large areas classified as MRZ-2a or MRZ-2b are located in the immediate vicinity of Nevada City (lode gold, placer gold, chromite, sand and gravel) and Grass Valley (lode gold, chromite, crushed stone, placer gold); between Scott's Flats Reservoir and Red Dog/You Bet (placer gold, sand and gravel); north of Route 20 between Grass Valley and Lake Wildwood (placer gold, lode gold, chromite, gold, sand and gravel); north of the South Yuba River (gold, sand and gravel, placer gold). Smaller areas are located west of Penn Valley (copper-zinc, sand and gravel, crushed stone); east of the Spenceville area (copper-zinc); north of Iron Mountain (copper-zinc); around Pine Hill (lode gold); and in various spots along the Bear River running northeast from Lake Combie (crushed stone, sand and gravel).

In central Nevada County there are three large areas classified as MRZ-2a or MRZ-2b stretching from the Nevada-Sierra county line south to the Nevada-Placer county line. The westernmost area extends from the Sleeping Beauty Mine through Washington to south of the Alpha Mine (lode gold, placer gold, sand and gravel, chromite, barite); the middle area extends from the Republic (South) Mine to the Zeibright Mine south of Lowell Hill Ridge (lode gold, placer gold, sand and gravel); and the easternmost area extends from the North Wisconsin Mine south to the Last Chance Mine (lode gold). Smaller areas occur near Relief (placer gold); near Dutch Flat (placer gold, barite); and in an area extending from Graniteville south to the Gaston Ridge (placer gold, lode gold).

Eastern Nevada County has one long stretch of land classified as MRZ-2a or MRZ-2b extending along the Truckee River through the Town of Truckee east to Hirshdale (sand and gravel, crushed stone). A smaller area occurs on the northeast side of the Boca Reservoir (sand and gravel).

General Plan Impacts

Because MRZ-2 areas are located in and around Grass Valley and Nevada City, significant development proposed within the spheres of influence of these cities would potentially impact significant mineral resources. The total areas impacted by growth within theses areas would range between 3,500 and 4,500 acres. This would represent approximately five percent of the total area of the MRZ-2 classification in the western county (approximately 75,000 acres).

Because Washington and Red Dog/You Bet are located within MRZ-2 zones, proposed expansion of these communities could result in additional impacts on mineral resources beyond those identified above. At an average lot size of 1.5 acres, an additional 500 population in one of these areas would expand the impact on MRZ-2 land by 300 acres.

General Plan Compliance

Policies focused on preservation of mineral resources outside the spheres of influence, coupled with recognition of the primacy of other uses within the spheres have been drafted to provide consistency in the General Plan. The General Plan Land Use Maps specifically identify designations considered to be incompatible for surface mining. "Land use inherently incompatible with surface mining or surface access to subsurface mining are considered to be land with significant public or private investment in structures, land improvement, and landscaping and that may prevent mining because of the greater economic value of the land and its improvements. Examples of such uses may include, but shall not be limited to, residential (other than rural), public facilities and commercial."

Another policy states that "already existing development, as well as undeveloped private lands, shall be protected from adverse environmental effects caused by mining through enforced use permit conditions and mitigation measures, or denial of the project." In addition, "surface access to subsurface mining is conditionally permitted only in compatible General Plan Designations as defined in the General Plan policies. However, vent and escape shafts are permitted in incompatible General Plan designations as defined in the policies where surface disturbance is minimal."

Mineral resources (MRZ-2 areas) are represented on the Preliminary Draft General Plan Land Use Maps. The Maps include a Significant Mineral Deposit identification reflecting MRZ-2 areas as determined in the State Classification Reports and similar studies. At anytime a Classification Report is presented to the County, said Maps shall be amended to reflect the Report within 12 months. When it is necessary, due to the lack of specificity, to clarify the exact location of this identification, said Reports shall be used.

In order to prevent intrusion of incompatible land uses into areas of identified important mineral resources the County shall zone lands identified as MRZ-2 areas in the "ME" Mineral Extraction Combining District as a means to provide for the public awareness of the potential for surface mining to occur where it has been established that important minerals are present. The "ME" District shall be used only on those lands which are within a compatible General Plan designation and which are not residentially zoned.

Significant Agricultural Lands

Constraint Defined

Agricultural lands are areas that need to be maintained for agricultural production as a state and national resource. The productivity of agricultural lands is

not the only reason for valuing this resource. These lands frame and separate the great urban areas and make the landscape more attractive. Properly managed, they keep the air clean and recharge the ground with fresh water. Ideally the wise preservation of agricultural land compliments urban growth–shaping urban centers, preventing urban sprawl and concentrating urban services such as transportation, with savings in energy and resources.

The California Department of Conservation, Farmland Mapping and Monitoring Program identifies seven classifications for important farmland. These are as follows:

1. prime farmland - land with the best combination of physical and chemical features for the production of agricultural crops;
2. farmland of statewide importance - land with a good combination of physical and chemical features for the production of agricultural crops;
3. unique farmland - land of lesser quality soils used for the production of the State's leading agricultural cash crops;
4. farmland of local importance - non irrigated land with "prime" and "statewide" soil mapping units, land in production which does not meet any of the above criteria, and land legislated to be used only for agricultural purposes;
5. grazing land - land on which the existing vegetation is suited to the grazing of livestock;
6. urban and built-up land - land occupied by structures or infrastructures to accommodate a building density of at least one unit to one and one-half acres, or approximately six structures to ten acres; and
7. other land - land which does not meet the criteria of any other category.

For the purposes of identifying the significant agricultural lands in Nevada County, only the first four classifications will be considered in this analysis.

Extent of Constraint

Farmland of local importance is scattered throughout western Nevada County with major concentrations occurring northeast and east of Nevada City, around the perimeter of Penn Valley and Lake Wildwood, west of Golden Oaks, and southwest of Chicago Park. Prime farmland, farmland of statewide importance and unique farmland are very minimal in western Nevada County. Small acreages of prime farmland occur in Chicago Park, near Grass Valley, in Penn Valley (some sizable lots south of Penn Valley), north of Alta Sierra and in other scattered locations. Small acreages of farmland of statewide importance occur north of Newtown, south of Lake of the Pines, west of Wolf, west of Willaura Estates, in Penn Valley and near Lake Wildwood, south of Sweetland, near North San Juan, south of North Columbia, and in other scattered locations. Small acreages of unique farmland occur in Chicago Park, north of Alta Sierra, southwest of Grass Valley, in Penn Valley, west of Newtown, near Peardale, south of Nevada City, near Cherokee, and northwest of Nevada City Airport.

There is no agricultural land mapped in eastern Nevada County.

General Plan Impacts

Because farmland of local importance is so widespread throughout western Nevada County, significant development in the Nevada City, Grass Valley, Penn Valley/Lake Wildwood, Alta Sierra, and Higgins Corner/Lake of the Pines areas would potentially impact this significant agricultural land. Prime and unique farmland and farmland of statewide importance are scattered throughout areas where significant development would occur (particularly near Grass Valley and in Chicago Park). And expansion and infill of the Penn Valley/Lake Wildwood and Alta Sierra areas would potentially impact all four classifications (defined above) of significant farmland.

General Plan Compliance

According to the proposed General Plan Land Use Maps, agricultural lands occur primarily on land designated as Rural, Residential, Estate, and Open Space. Agricultural uses are compatible with these designations.

Agriculture is strongly encouraged in *Rural Regions* and allowed in *Community Regions.* Agricultural land shall include all those land areas of Nevada County now used for agricultural operations, or upon which agricultural operations may be established in the future in conformance with applicable zoning regulations

In order to maintain and encourage agriculture on agriculturally-zoned lands, especially those which border *Community Regions*, while minimizing conflicts with adjacent nonagricultural lands, the *Community Region* boundaries identified on the General Plan Land Use Maps shall be maintained to protect agriculturally zoned lands at the urban fringe for continued agricultural use. Conversion of such lands to urban uses shall not be allowed unless the *Community Region* boundary is changed in accordance with the relevant policies of the General Plan.

Outside of *Community Regions*, existing agricultural zoning shall be maintained on land designated as Rural on the General Plan Land Use Maps, including land in the RA, A1, AE, FR and TPZ districts, to allow for the continuation of existing agricultural operations, as well as the introduction of new agricultural operations consistent with the regulations of the respective districts.

The development of policies to clarify the basis for zoning of agricultural land has been provided to deal with the widespread scattered location of land classified as significant. One policy states that "all important agricultural lands ...containing lands shown on the State Important Farmland Map as prime, of statewide importance or local importance, and unique, shall be protected from incompatible land uses." This shall include zoning within the "AE" Agricultural Exclusive Zone requiring a minimum 40 acre parcel. This minimum is consistent with that required for Williamson Act lands.

Another policy recommends that "all new residential and residential support uses adjacent to lands zoned "AE" shall require a setback of not less than 100 feet to minimize potential land use conflicts." And another policy following this same vein of thinking recommends that "clustering of new residential development in *Rural Regions* shall be encouraged and utilized in accordance with applicable Land Use policies of the General Plan to reduce potential conflicts between agricultural operations. Such clustering shall provide for a natural or man-made buffer between

the residential development and adjacent agricultural uses. Clustering shall be mandatory when the subdivision is adjacent to lands zoned "AE".

Steep Slopes/High Erosion Hazard

Constraint Defined

Slope information is derived from published United States Geologic Survey map data at five foot-contour intervals. For the purposes of this analysis steep slopes are those greater than 30 percent. Because much of Nevada County is steeply sloping, the threat of landslides is ever present. However, due to the fact that most of the soils within the County are underlain with dense bedrock, and lack the depth and cohesionless structure associated with ground failure, most landslide hazards should be considered moderate at worst.

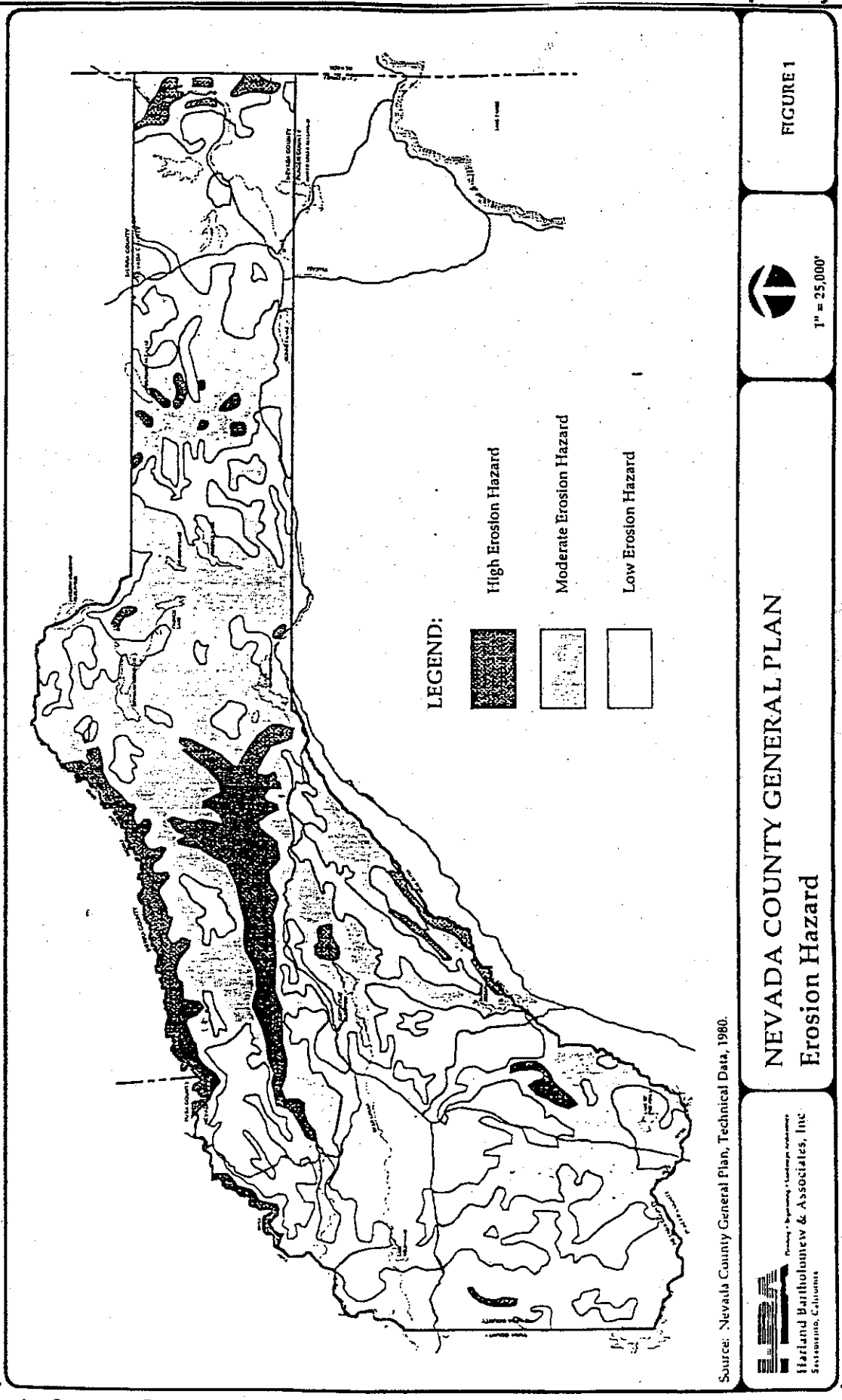
Even though geologic conditions in Nevada County reduce the potential hazards from ground failure and landslides, the County's steep terrain and deep snowpack present the potential for earthquake induced avalanches in the mountainous areas. Steep slopes limit the construction of buildings, due to the increased risk of slippage. Steep slopes also decrease water quality by increasing the amount of run-off and level of turbidity in local waterways. And, slope is one factor that influences the potential for fire hazard - the steeper the slope the faster the fire climbs. The construction of roads and roadcuts are also limited in areas with steep slopes. The effect of such grading activities can create an unstable condition and result in a landslide. Erosion hazard is variable but generally increases near major rivers and with steeper slopes.

Extent of Constraint

Steep slopes in Nevada County are concentrated along the major stream valleys and along the Pacific Crest Trail. The largest extent of slopes greater than 30 percent are located along the Middle Yuba River, the South Yuba River, and the Pacific Crest Trail. Pockets of steep slopes are also located along the Bear River, Deer Creek, Wolf Creek, and South Wolf Creek. Areas of high erosion hazard generally correspond to areas of steep slopes (see Figure 1).

General Plan Impacts

Because areas of steep slope are concentrated along the Middle Yuba River, the South Yuba River, and the Pacific Crest Trail, which are outside areas of significant potential growth, the impacts on areas of steep slope and high erosion hazard are relatively limited. Pockets of steep slope and associated high erosion hazard do exist within the Nevada City sphere, within Alta Sierra, and in the New Village/New Town zone.


LEGEND:
High Erosion Hazard
Moderate Erosion Hazard
Low Erosion Hazard
NEVADA COUNTY GENERAL PLAN
Erosion Hazard
1" = 25,000'
FIGURE 1
Source: Nevada County General Plan, Technical Data, 1980.
Harland Bartholomew & Associates, Inc

General Plan Compliance

In order to establish land use patterns and development standards that shall minimize hazards resulting from slope failure, avalanche, and other natural occurrences the County shall cooperate with appropriate Federal, State and local agencies in assessing and maintaining the most current data concerning geologic hazards as the basis for defining appropriate site design standards, and project site plan review. The County will additionally cooperate with and encourage the activities of the Nevada County Resource Conservation District in identifying critical soil erosion problems and pursuing funding sources to resolve such problems.

In order to protect environmentally sensitive land and allow for resource management, the County shall prepare and adopt Comprehensive Site Development Standards which shall be applicable to all development projects in *Community Regions* and *Rural Regions* depicted on the General Plan Land Use Maps. These standards shall identify the basic requirements for site development in the County, including, but not limited to the following: protection of environmentally sensitive resources; prevention and elimination of fire hazards; and maintenance and enhancement of vegetation and landscaping.

In addition, clustering of development shall be mandatory for all discretionary projects within the Estate, Rural-5, Rural-10, and Rural-20 designations on the General Plan Land Use Maps in order to preserve and/or conserve on-site areas which exhibit environmental features such as: steep slopes (greater than 25%) and areas vulnerable to avalanche and soil with high erosion potential Clustering may be achieved by building site clustering with creation of permanent open space; restriction of buildable area on individual lots; or other means which are consistent with the protection of the natural resources and environmental characteristics on the site.

The Preliminary Draft General Plan Land Use Maps also provide for adequate evacuation routes in areas of high avalanche hazard, fire hazard, and other natural hazards resulting from steep slopes. Consistent with the Emergency Operational Plan, the routes designated on the General Plan Land Use Maps as Interstate, freeways, highways, and other principal arterial routes shall be considered primary evacuation routes on a county-wide basis. Such routes provide the highest levels of capacity and contiguity and serve as the primary means for egress from the County.

The routes designated on the General Plan Land Use Maps as minor arterial or major collector routes shall be considered secondary evacuation routes on a county-wide basis. These routes supplement the primary evacuation routes, and provide egress from local neighborhood and communities.

Soil Capability

Constraint Defined

Soil capability for community development is defined by soil limitations for three factors (dwellings, excavations and septic tank filter fields) based upon the soil interpretations found in the Soil Survey of Nevada County. In the Soil Survey limitations for each of the three factors are stated as "slight", "moderate", or "severe". For the purpose of analyzing the proposed General Plan Designations in relation to

soil capability, the interpretations were applied to the Soil Survey's General Soils map to identify location of soils having potential "severe" limitations for each of the three factors.

Extent of Constraint

All soil types within Nevada County are classified by the U.S. Soil Conservation Service (SCS) as having "severe" limitations for private sewage disposal. Specific limitations may include slow permeability; slope (greater than 9 percent); and shallow depth to bedrock (less than 4 feet). The capability classifications shown in Figure 2 are a refinement of the SCS data and were prepared by the Nevada County Planning Department based upon specific soil attributes. The capabilities reflect differentiation between soil types, with soils having the least constraints given the highest rating for septic tank capability. Soil types with potential "severe" limitations for construction of dwellings or for excavation are found throughout the southeastern and south western portions of the County. These soils have limitations due to the slopes; shallow depth to bedrock; and (in some cases) high shrink-swell potential. In addition, more localized "severe" limitations may exist within other soil associations due to steep slopes or rock outcroppings.

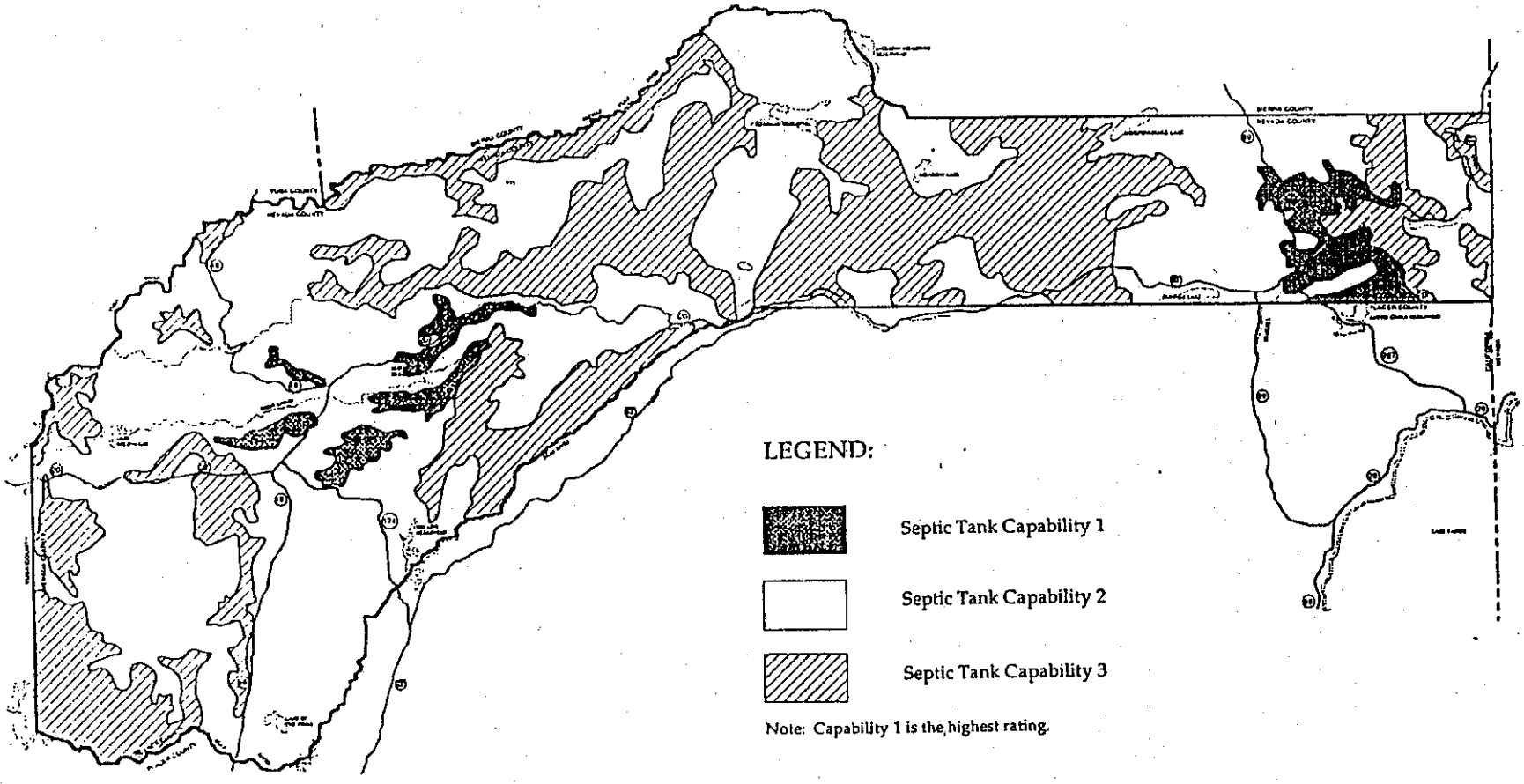
General Plan Impacts

Because the soils throughout the county are rated as having potential severe limitations for septic tank filter fields, proposed development with a likelihood of greatly increased septic tank usage could have a significant impact on soil capability if proper installations and maintenance standards are not enforced. Although there is no basis from which to project specific rates or thresholds for failure of septic systems, the potential limitations of the soils suggest that long-term reliance on and more widespread use of septic systems would require adherence to standards and on-going monitoring to ensure that systems perform adequately.

Limitations for construction (dwellings and excavation) are largely due to the presence of bedrock at depths of less than 4 feet from the surface, although steep slopes and high shrink-swell potential may also be limiting factors in certain locations. Because engineering solutions are almost always available to overcome the limitations, the principal constraint becomes one of cost, since the additional measures may add considerably to the costs of construction. Because limitations for excavation affects virtually all types of construction, the limitations prevalent throughout the southeastern part of the County could significantly affect the cost of infrastructure improvements in areas such as Alta Sierra and Lake of the Pines. Also, the soil capabilities suggest that the siting of a new town or village focus on areas between Spenceville and McCourtney Roads to avoid potentially higher construction costs.

General Plan Compliance

In order to minimize adverse impacts of grading activities, loss of soils, and soil productivity, the County shall cooperate with and encourage the activities of the Nevada County Resource Conservation District in identifying critical soil erosion problems and pursuing funding sources to resolve such problems. The County shall additionally cooperate with appropriate Federal, State and local agencies in assessing and maintaining the most current data concerning geologic hazards as the basis for defining appropriate site design standards, and project site plan review.



Source: Nevada County General Plan, Technical Data, 1980.

Harland Bartholomew & Associates, Inc
Sacramento California

NEVADA COUNTY GENERAL PLAN
Septic Tank Capability

1" = 25,000'

FIGURE 2

The General Plan policies regulate density of development in areas served by individual sewage disposal systems consistent with County Environmental Health standards. Also under General Plan policies, development in areas of steep slopes and geologic hazards would be regulated on a site-specific basis through application of Comprehensive Site Development standards to all discretionary and ministerial projects. Related policies provide for the use of clustering of development with use dedication of open space or "no-build" easements to restrict building in portions of sites with severe development limitations.

In order to provide for public facilities and services commensurate with development type and intensity, public facilities and services shall be directed as follows: a higher level to *Community Regions* and a lower level to *Rural Regions*. The levels of service and provision of public facilities in *Community Regions* shall be based upon improving the capacity of public facilities to serve higher levels of development directed to *Community Regions.* The levels of service and provision of public facilities in *Rural Regions* shall be based upon limiting the amount of development to ensure that adequate facilities are available. Outside of *Community Regions* the General Plan Land Use Maps maintain Rural designation.

In order to develop and operate public facilities and services in an environmentally sound way, consideration shall be given to restoration of areas of cut, back-fill, and grading where water, sewer, and other underground utilities are extended through undeveloped natural areas. All surfaces shall be revegetated with appropriate ground covers and plant materials.

Flood Hazard

Constraint Defined

Flooding of lands adjacent to streams and rivers is caused by flows that exceed the capacity of the normal water course. This type of flooding involves the spill-over of above-normal stream flows onto lands immediately adjacent to the normal watercourse. Those areas subject to overflow are referred to as the stream or river's flood plain. Another form of flood hazard is dam failure, which can occur as a result of manmade or natural causes. Such causes include improper siting, structural design flaws, erosion of the face of foundation, earthquakes (discussed in more detail below as a flood-related hazard), massive landslides, and rapidly rising flood waters. Flooding can result in loss of life (human and animal), injuries, damage to property, social and economic dislocation, and blockage of water by objects swept into waterways by the force of the floodwaters.

Earthquakes are naturally occurring events that involve primary and secondary seismic related impacts. Primary impacts are those caused by the actual breaking and shaking of the ground. For example, a potential primary impact would be dam failure resulting from severe ground shaking, which in turn would result in flooding. Secondary impacts include ground settlement, soil liquefaction, landslides, and seiches, which would be considered moderate at worst due to the characteristics of Nevada County's soils and bedrock.

Generally, the hazard of an earthquake is based on the interrelationships between faults, weak geologic materials, and human activity. Faults within the State of California are divided into three categories; prequaternary (older than two million years), Quaternary (younger than two million years), and historic (less than 200 years).

Extent of Constraint

Areas within Nevada County subject to 100-year and 500-year flooding are as follows (see Figure 4 of the Open Space/Conservation Inventory): Deer Creek west from Scott's Flat Reservoir through Nevada City towards Lake Wildwood; two tributaries bordering Alta Sierra and Highway 49 to the east and west; along Bear River to Rollins Reservoir; Little Greenhorn Creek; Greenhorn Creek; Steep Hollow Creek; the South Yuba River; the entire extent of the Truckee River through eastern Nevada County; and tributaries that run south into Prosser Creek Reservoir, Boca Reservoir, and Martis Creek Reservoir. Shorter stretches are located south of Nevada City; along Highway 20 near Penn Valley; and in the northwest area of the county. The flood hazard areas are generally confined to the areas adjacent to the County's local rivers and streams.

There are 10 dams located within Nevada County, owned and/or operated by various agencies or organizations. These include: Scott's Flat Dam (Nevada Irrigation District (NID)); Lower Scott's Flat Dam (NID); Rollins Dam (NID); Combie Dam (NID); Magnolia Dam (Lake of the Pines Home Owners Association); Bowman Dam (NID); Jackson Meadows Dam (NID); Martis Creek Dam (U.S. Army Corps of Engineers); Prosser Creek Reservoir Dam (U.S. Army Corps of Engineers); Boca Reservoir Dam (U.S. Army Corps of Engineers); Spaulding Reservoir (Pacific Gas & Electric); Englebright Reservoir (U.S. Army Corps of Engineers); Lake Wildwood (Lake Wildwood Home Owners Association); Donner Lake (Sierra Pacific Power); and Independence Lake (Sierra Pacific Power).

The areas of western Nevada County in which dams exist are not located within historical seismic zones. In fact, the western half of the County resides within the lowest "Maximum Expectable Earthquake Intensity" zone in California (see Figure 3). On the other hand, the far eastern portion of the County is classified in the highest earthquake intensity zone. Within this area are three major dams; Prosser Creek Reservoir Dam, Stampede Reservoir Dam (located within Sierra County), and Boca Reservoir Dam.

A Seismotechtonic Study of the Truckee/Lake Tahoe Area identified two major faults believed to be "potential seismic sources of greatest significance" in the eastern portion of the County - The Mohawk and Dog Valley Faults. The Dog Valley Fault appears to be the more active of the two and of special significance due to its close proximity to the three dams listed above. However, the Truckee earthquake of 1966 had a magnitude of 5.4 and an intensity of VII, but only relatively slight damage occurred to both Prosser and Boca earthfill dams (OES).

Also worth noting is the hazard of seiches. Seiches are seismically induced waves in bodies of water that can be considered a flood-related hazard. There is still much to learn about seiches, but it is known that they are particularly hazardous where lakes and reservoirs are bordered by campgrounds or other facilities on flat banks. Because of the large number of recreational lakes in Nevada County, seismically-induced seiches could prove very damaging. However, considering the

LEGEND
Zones
I - Low
II - Mod.
III - High
Prob. Damage
minor to moderate
moderate
major
Prob. Max. Intensity
VI or VII
VII or VIII
IX or X
Historic Fault (less than 200 yrs.)
Quaternary Faults (younger than 2 mil. yrs.)
Pre-Quaternary Faults (older than 2 mil. yrs.)
3.0-4.4
4.5-6.4
≥6.5
June, 1808 through 1969
1970 through Dec., 1987
Zone I
Zone II
Zone II
Zone III
Sources: National Earthquake Information Center, Epicenter Map, 1987.
Generalized Geology and Major Faults in the Northeastern Sierra Nevada, 1990.
O E S Emergency Operations Plan, 1990.
Harland Bartholomew & Associates, Inc
Sacramento, California
NEVADA COUNTY GENERAL PLAN
Epicenters and Faults Map
1" = 25,000'
FIGURE 3

overall seismic risk in this County, seiche risk should be considered only a moderate hazard.

General Plan Impacts

Because flood plain areas are located in and around Nevada City, Grass Valley, Penn Valley, Alta Sierra, Truckee, Hobart Mills, and Floriston, development within these areas would potentially affect the probability of flood hazards occurring and affect local dams in respective areas. The growth of Red Dog-You Bet, Washington, and Chicago Park rural places would all potentially impact flood plain areas.

Although western Nevada County is located within the lowest earthquake intensity zone in California, Quaternary faults are generally classified as potentially active (California Geology, 1984). Because such a fault is in close proximity to Grass Valley, Alta Sierra, and Lake of the Pines, these areas would potentially be affected by a future earthquake. However, since the number of dams near this fault are few, the possibility of a flood-related hazard occurring as a result of an earthquake in this area is not likely.

General Plan Compliance

In order to establish land use patterns and development standards to minimize hazards resulting from flooding, the County shall continue to work with appropriate local, State and Federal agencies (particularly FEMA) in maintaining the most current flood hazard and floodplain information as a basis for project review in order to limit development in such areas in accordance with Federal, State and local standards.

The County shall avoid potential increases in downstream flooding potential by protecting natural drainage and vegetative patterns through project site plan review, application of Comprehensive Site Development Standards, use of clustered development, and project subdivision design. The Comprehensive Site Development Standards shall include measures applicable to all discretionary and ministerial projects to avoid downstream flooding resulting from new development. Such measures, shall include, but not be limited to: avoidance of stream channel modifications; avoidance of excessive areas of impervious surfaces; and use of on-site retention or detention of storm water. In addition to the above measures, the County shall continue to participate in the National Flood Insurance Program.

The County shall also coordinate with the State Office of Emergency Services for earthquake, seiche, and other natural disaster and encourage public awareness of implementation of State programs. The local earthquake preparedness plan shall be coordinated with regional plans for earthquake preparedness through the local and State Office of Emergency Services.

The Preliminary Draft General Plan Land Use Maps provide for adequate evacuation routes in areas of high potential for dam failure, flooding, or other natural disaster. Consistent with the Emergency Operational Plan, the routes designated on the General Plan Land Use Maps as Interstates, freeways, highways, and other principal arterial routes shall be considered primary evacuation routes on a county-wide basis. Such routes provide the highest levels of capacity and contiguity and serve as the primary means for egress from the County.

The routes designated on the General Plan Land Use Maps as minor arterial or major collector routes shall be considered secondary evacuation routes on a county-wide basis. These routes supplement the primary evacuation routes, and provide egress from local neighborhood and communities.

Special Status Species

Constraint Defined

Special status species are those plants or animals which are recognized by the California State Department of Fish and Game (DFG) or the U.S. Fish and Wildlife Service as being rare, endangered, or threatened. Generally, animals are considered to be endangered if one of the following characteristics applies:

1. mortality rate exceeds birth rate;
2. animal is incapable of adapting to environmental change;
3. habitat is threatened by serious disturbance;
4. survival is threatened by introduction of unwanted species; or
5. environmental pollution threatens survival.

An animal is defined as "rare" if any of the following characteristics apply:

1. animal is confined to a small specialized habitat and is incapable of change;
2. animal is abundant nowhere;
3. animal is so limited that any appreciable reduction would cause it to be endangered; or
4. if current management programs were stopped, animal would become endangered.

Known special status animals, plants, birds, amphibians, and fish located within Nevada County are as follows respectively: wolverine, Pacific fisher, Sierra Nevada red fox, pine marten, and snowshoe hare; scadden flat checkerbloom, Cantelow's lewisia, Donner Pass buckwheat, short-petaled campion, long-petaled lewisia, Plumas ivesia, and Truckee barberry; northern goshawk, black swift, yellow warbler, willow flycatcher, yellow-breasted chat, russet-backed thrush, spotted owl; foothill yellow-legged frog, red-legged frog; and Lahontan cutthroat trout.

Extent of Constraint

The following special status species are found in Nevada County (see Figure 7 of the Open Space/Conservation Inventory). The location of a species is a rough estimate derived from the mapped one (1) and five (5) mile radii on the aforementioned figure. There is a good chance that special status species exist in areas not yet officially mapped, as the majority of the county has not been systematically surveyed and studied.

Animals

A snail that goes by the Latin name of *Monadenia mormonum buttoni* can be found near Emigrant Gap (roughly within a five mile radius). The Pacific fisher has been located near Bowman Lake and Sterling Lake (roughly within a five mile radius). The wolverine has been sighted near Firtop, Indian Springs, Catfish Lake, and just east of Highway 89 south of the Nevada-Sierra county line (at all sites roughly within a one mile radius). This animal has also been sighted at the Nevada-Sierra county line north of Bear Valley (roughly within a five mile radius).

Plants

Scadden flat checkerbloom is located due west of Grass Valley (roughly within a one mile radius). Cantelow's lewisia is located north of the South Yuba River, west of Grizzly Hill Road (roughly within two one mile radii) and also along the Sierra/Nevada County line north of Cruzon Grade Road (roughly within a five mile radius). Donner Pass Buckwheat is found in the vicinity of Norden, Castle Peak (for both sites roughly within a one mile radius and five mile radius), Meadow Lake (roughly within a five mile radius), and west of White Rock Lake (roughly within a one mile radius). Short-petaled campion is prevalent south and southeast of Independence Lake (roughly within one and five mile radii), but can also be found east of Sterling Lake almost to Buzzard Roost (roughly within a one mile radius). Long-petaled lewisia is also found near Castle Peak (roughly within a five mile radius) and just northwest of there near Sand Ridge Lake (roughly within a one mile radius). Plumas ivesia can be found in the vicinity of Martis Creek Reservoir, Prosser Creek Reservoir, and east of Highway 89 along Sagehen Creek (all within one mile radii). And Truckee barberry can be found east of Truckee north of the Truckee River (roughly within a one mile radius).

Birds

The northern goshawk has been located near North Bloomfield (roughly within two five mile radii), along the Nevada-Sierra county line north of Sagehen Creek and south of Stampede Reservoir (roughly within two five mile radii), and in the vicinity of Prosser Creek reservoir (roughly within a five mile radius). Black swift can be found in the vicinity of Kingvale (roughly within a five mile radius). The yellow warbler has been sighted near Truckee (roughly within a one mile radius) and the willow flycatcher has been seen near the Nevada-Sierra county line and Highway 89 north of Sagehen Creek (roughly within a five mile radius).

Amphibians

The foothill yellow-legged frog has been located near Washington (roughly within both a one mile and a five mile radius).

Fish

Lahontan cutthroat trout can be found in the vicinity of Weaver Lake, west of Jackson Meadows Reservoir (roughly within a linear stretch of a half mile by five mile), and in the vicinity of Independence Lake (roughly within the limits of the lake).

General Plan Impacts

Because the foothill yellow-legged frog is located near Washington rural place, growth in this area would potentially impact this special status species. And the buildout of Grass Valley's sphere of influence would potentially impact the special status species scadden flat checkerbloom. As stated previously, there is a good chance that special status species exist in areas not yet officially mapped. Future surveys and mapping may be necessary to provide further data. Another factor to consider is the presence of species in Nevada County proposed for listing which would be affected by the General Plan.

General Plan Compliance

In order to protect significant and sensitive habitats from intrusion and encroachment by incompatible land uses, critical wildlife areas and movement corridors; rare, threatened or endangered plant and animal species; and significant water courses and riparian areas shall be protected by mandatory clustering of development on lands supporting said resources.

The General Plan identifies the following as critical wildlife areas:

- Meadows and wetlands
- Deer migration corridors
- Winter deer range, and fawning areas
- Habitat for resident populations
- Large blocks of undeveloped hardwood forest.

Where critical wildlife areas and movement corridors, significant water courses and riparian areas are identified during review of projects, the County shall protect the resources from degradation by requiring all portions of the project site that contain or influence said areas to be retained as non-disturbance open space through mandatory clustered development on suitable portions of the project site, or other means where mandatory clustering cannot be achieved.

The intent and emphasis of open space designation and non-disturbance is to ensure continued viability of contiguous or inter-dependent habitats by precluding any fragmentation of existing habitat areas and preserving all movement corridors between related habitats. The intent of clustering is to provide a mechanism for natural resource preservation while protecting reasonable expectations for development of private property.

In addition, the Estate, Rural, and Forest land use designations as shown on the General Plan Land Use Maps shall provide for the production of timber in order to promote and provide for the continued diversity and sustainability of the forest resources including wildlife habitat.

Wildlife Habitat

Constraint Defined

A given type of vegetation association, with associated animal life, is referred to as a life zone. The life zones which exist in Nevada County include: Upper Sonoran, Transition, Canadian, Hudsonian, Arctic-Alpine, and Mixed Conifer-Jeffrey Pine-Sagebrush. Table 5-1 of the Nevada County Master Environmental Inventory (MEI) presents a description of all the life zones which occur in Nevada County. The table identifies the basic habitat groups which occur in each zone and presents a characterization of the dominant vegetation and wildlife species which occur in each zone. The DFG recognizes five primary wildlife habitat types in California: tree dominated; shrub dominated; herbaceous dominated; aquatic; and developed. Each of these basic habitat types is further subdivided as shown in Table 5-2 of the MEI. Appendix B of the Nevada County MEI contains a brief description of each community.

Extent of Constraint

A life zone is an area generally uniform of homogeneous characteristics located within very general geographic boundaries. Table 5-1 of the MEI identifies general characteristics of the life zones and provides general locations for each one. Figure 4 presents specific boundaries of the life zones in Nevada County.

General Plan Impacts

Because the aforementioned life zones are characterized by very general geographic boundaries, development and growth within all six zones would potentially impact the significant wildlife habitat of these zones. These habitats occur in continuous stretches and animals may move between various habitat types to satisfy their life requirements. In this context, it is possible that loss of a habitat could constitute an adverse effect (because of local or regional scarcity and ecological value of a habitat) even though the individual species of plants which make up the habitat, or animal species which use the habitat may not, in and of themselves, be endangered or rare. The western portion of the county, especially the Upper Sonoran and Transition life zones, have experienced rapid residential growth in recent years and the resultant parcelization, fencing, alteration of vegetation, introduction of cats and dogs, roadways, noise and night lighting have served to reduce the habitat values throughout the area. Factors such as these may need to be addressed prior to any proposal of development.

General Plan Compliance

In addition to implementing the measures mentioned above (special status species section) to protect significant and sensitive habitats from intrusion and encroachment by incompatible land uses, the County shall also develop standards to minimize removal of existing vegetation and require installation of landscaping in setbacks and buffer areas. As part of the Comprehensive Site Design Standards, require use of native and/or site-appropriate plant species for landscaping of all new multi-family residential, commercial, and industrial projects.

Sierra Nevada Crest
LEGEND:
Flora and Fauna Life Zones
1. Upper Sonoran Life Zone
2. Transition Life Zone
3. Canadian Life Zone
4. Hudsonian Life Zone
5. Arctic-Alpine Life Zone
6. Mixed Conifer-Jeffrey Pine-Sagebrush Life Zone
1
2
3
4
4
5
6
NEVADA COUNTY GENERAL PLAN
Flora & Fauna Life Zones
Harland Bartholomew & Associates, Inc
Sacramento, California
1" = 25,000'
FIGURE 4

To minimize impacts to corridors to ensure movement of wildlife; to provide for the integrity and continuity of wildlife environments; to minimize the environmental impacts of land development, agricultural, forest, and mining activities on important and sensitive habitats; to identify and preserve heritage and landmark trees and groves where appropriate; and to minimize removal or disturbance of low elevation oak habitat the Comprehensive Site Design Standards shall include measures applicable to all discretionary and ministerial projects to protect and maintain heritage and landmark trees and groves, and low elevation oak habitat.

To support the acquisition, development, maintenance and restoration, where feasible, of habitat lands for wildlife enhancement the County shall participate in all bio-regional planning councils, initiated by Federal or State agencies, that involve lands within the jurisdiction of Nevada County. The purpose of participation shall be to ensure the policies of the General Plan are complimented by and incorporated into any bio-regional plan encompassing all or part of Nevada County.

And, in order to support, where feasible, the continued diversity and sustain ability of the habitat resource through restoration and protection the County shall monitor the sensitive wildlife and habitat resources of Nevada County to ensure the continued validity and effectiveness of General Plan policies intended to protect, preserve and enhance these resources. In particular, the Estate, Rural, and Forest land use designations as shown on the General Plan Land Use Maps shall provide for the production of timber in order to promote and provide for the continued diversity and sustainability of the forest resources including timber, watersheds, and wildlife habitat.

Migratory Deer Ranges

Constraint Defined

The deer population in Nevada County is made up of both resident and migrating animals. Western Nevada County supports the migratory Nevada City deer herd, as well as resident populations of the Motherlode herd. Eastern Nevada County supports the Loyalton-Truckee deer herd (see Figure 5 of the Open Space/Conservation Inventory). Nevada County supports a variety of wildlife habitats which are important or unique. Two of these habitats that are relevant for this evaluation are movement corridors and residence/breeding/foraging areas. Movement corridors are unique wildlife habitats that serve two primary purposes: first, to enable migratory animals, deer in this case, to move seasonally from and between winter and summer habitats; and second, to allow animals to move within their home range or residence areas.

Extent of Constraint

SR 49 and SR 174 running from the Yuba/Nevada County line to the Nevada/Placer County line provides a manmade boundary line dividing the Motherlode deer herd and the Nevada City deer herd. The Motherlode herd inhabits the territory west of this boundary and is resident within that area. The Nevada City herd's territory extends from this boundary all the way over to another boundary that almost virtually follows the Pacific Crest Trail. This herd takes advantage of corridors that link winter and summer habitats serving the life cycle of the animal. The Nevada City herd's winter range extends from the boundary that butts up against the Motherlode herd east to Washington. The northern portion of this range is considered the herd's critical winter range. East from Washington is the herd's intermediate range which doubles as part of it's summer range. The major migration corridor for the herd is again the northern portion of this range. Even though the Motherlode deer herd is resident and the Nevada City deer herd is migratory, their winter ranges often overlap.

The Loyalton-Truckee deer herd summer range extends from the Pacific Crest Trail east to the California-Nevada state line. Critical deer fawning areas are located north of Hobart Mills and northeast of Martis Creek Reservoir. Two narrow migration corridors running north-south occur in the easternmost portion of the county. This herd migrates into both Sierra County and Placer County.

General Plan Impacts

Because the Motherlode deer herd resides throughout a large majority of western Nevada County, significant development within the spheres of influence of Nevada City and Grass Valley would potentially impact significant habitat ranges and migratory routes. This situation also exists for the Nevada City deer herd which ranges throughout a good portion of western Nevada County and has critical habitat and movement corridors in the northern reaches of these ranges.

The Loyalton-Truckee deer herd migrates throughout the eastern portion of the county with one route running just east of the Town of Truckee. Other migratory routes traverse areas of high urbanization. Therefore, significant development within the sphere of influence of Truckee, Hobart Mills, and surrounding urban communities would potentially impact significant migratory routes.

General Plan Compliance

The measures identified in the special status species and wildlife habitat sections are also those necessary to provide for conservation of deer populations and preservation of deer habitat.

Those areas reported to be deer critical winter range, major deer migration corridors, and known critical deer fawning areas are situated within low-density Forest, Rural, and Open Space land use designations on the General Plan Land Use Maps. Clustering of development is mandatory in the Rural designation for all discretionary projects where critical wildlife areas occur, including: deer migration corridors, winter deer range, and fawning areas.

Riparian Corridors

Constraint Defined

Riparian corridors are areas along water courses (typically in close proximity to the banks) which may provide water-related habitats and linkages for wildlife. The quality of a riparian corridor may be affected by various factors including vegetative cover, microclimate and proximity to development. However, even apparently degraded areas may retain some value particularly as linkages between higher quality corridors.

Extent of Constraint

There is an extensive network of perennial and intermittent creeks, rivers, streams and drainages within the county (see Figure 6 of the Open Space/Conservation Inventory). Although no data base exists which defines the quality or specific extent of riparian corridors, the existence of the extensive network of water courses means that the potential for significant riparian corridors is wide spread throughout the western county.

General Plan Impacts

Since existing and potential riparian corridors are widespread throughout Nevada County relative to the extensive network of water courses, any development within these areas would have some localized impact on the corridors.

General Plan Compliance

To preserve the integrity and minimize the disruption of watersheds and identified critical water courses; and to preserve and, where economically feasible, restore the density and diversity of water-dependent species and continuous riparian habitats based on sound ecological principles the County shall establish and enforce minimum building setback lines from both sides (defined as average high water mark) of significant streams and wetlands, that are adequate to permanently protect stream and wetland resource values.

The County will also utilize clustering of development to preserve stream corridors, riparian habitat and wetlands in accordance with Land Use policies for mandatory and voluntary clustering and will, within *Rural Regions*, maintain the low densities of development allowed in the Rural and Forest land use designations identified on the General Plan Land Use Maps, in order to protect existing watersheds.

In order to support the acquisition, development, maintenance and restoration, where feasible, of habitat lands for wildlife enhancement the County shall cooperate with State and Federal agencies and public and quasi-public organizations and agencies in the acquisition, restoration, and maintenance of habitat lands. Cooperate with and encourage the USFS and BLM to restore/maintain habitat areas on existing owned lands.

Due to the fact that riparian corridors are not well mapped for Nevada County, these areas are not represented on the Preliminary Draft General Plan Land Use Maps. However, where riparian areas are identified during review of projects, the County shall protect the resources from degradation by requiring all portions of the project site that contain or influence said areas to be retained as non-disturbance open space through mandatory clustered development on suitable portions of the project site, or other means where mandatory clustering cannot be achieved. This open space designation is to be permanently preserved as open space. Outside of *Community Regions* the Preliminary Draft General Plan Land Use Maps maintain the *Rural* designation with the low densities of development in order to protect riparian corridors.

Wetlands

Constraint Defined

Wetlands in Nevada County are generally small, isolated features dependent on riparian water; ditch leaks or overflows; diversions; or natural seeps or springs. Man-made or naturally occurring wetlands provide an important biological resource both through provisions of localized habitat and habitat for migratory species and as a natural water filtration system.

Extent of Constraint

Wetlands are not well mapped for Nevada County and there are no identified concentrations of wetlands for the area. But, as is the case with riparian corridors, although no data base exists which defines the quality or specific extent of wetlands, the existence of the extensive network of water courses means that the potential for significant wetlands is wide spread throughout the county.

General Plan Impacts

As is the case with riparian corridors, the characteristics of wetlands as dispersed features would result in there being potential localized impact associated with any development. However, because they are small and isolated (rather than extensive, as are the riparian corridors) there is not necessarily a correlation between lesser or greater impacts of development on wetlands.

General Plan Compliance

The following definition shall be used by the County when implementing any policy or administering any ordinance pertaining to wetlands:

"Wetlands are lands where the water table is at, near or above the surface of the land long enough to promote the formation of hydric soils (as defined by the U.S. Department of Agriculture Soil Conservation Service) or to support the growth of hydrophytes."

The measures discussed above in relation to riparian corridors are equally pertinent for the treatment of wetlands in proposed development areas.

Due to the fact that wetlands are not well mapped for Nevada County, these lands are not represented on the Preliminary Draft General Plan Land Use Maps. However, where wetlands are identified during review of projects, the County shall protect the resources from degradation by requiring all portions of the project site that contain or influence said areas to be retained as non-disturbance open space through mandatory clustered development on suitable portions of the project site, or other means where mandatory clustering cannot be achieved.. This open space designation is to be permanently preserved as open space. Outside of *Community Regions* the Preliminary Draft General Plan Land Use Maps maintain the *Rural* designation with low densities of development in order to protect existing wetlands.

Significant Timberlands

Constraint Defined

Timberlands are those lands capable, available and suitable for commercial timber production. Nevada County supports an extensive timber resource, the majority of which is under the jurisdiction of the Tahoe National Forest (TNF). For the purposes of this analysis we will be considering only those lands that fall outside of the TNF lands.

Extent of Constraint

Commercial timberlands, considered a renewable resource, are located primarily in the mid and eastern areas of the county, in elevation ranging from 1,200 feet above sea level in the west to over 9,000 feet in the east. Significant timberlands are referred to as Timber Production Zones (TPZ). Of approximately 629,000 acres considered suitable for timber production in the TNF, 449,842 acres are categorized as prime forest land.

General Plan Impacts

Generally TPZ lands and TNF lands in Nevada County would not be affected by any proposed land use designations.

General Plan Compliance

According to the policies of the General Plan, timber production and harvesting, as provided for in the TPZ regulations, are compatible in the Forest, Rural, and Estate land use designations. All of the identified TPZ lands of the County are located within these three designations on the Preliminary Draft General Plan Land Use Maps. The majority of the lands having significant timber resources, including the extensive tracts of timber across the northern portions of the County from San Juan Ridge eastward to the Nevada State line, are included in the Forest designation of the Preliminary Draft General Plan and mapped accordingly on the Land Use Maps. This designation is intended to provide primarily for the protection, management, and use of timber resources. Other uses are strictly limited to those which are compatible with and support management of the County's timber resources.

Fire Hazard Zones

Constraint Defined

The California Department of Forestry has identified three Fire Hazard Severity Zones. These are as follows:

- **moderate** - foothill areas with lighter species of scrub brush;
- **high** - foothill areas with heavy brush; and
- **very high** - steep slopes primarily with wildland areas of timber and heavy brush.

According to the "Be Fire Safe" guidelines, vegetative areas generally over 8 percent in slope are defined as fire hazardous. Basically, the steeper the slope the faster the fire climbs. The CDF has categorized vegetation based on fuel burning characteristics. These are as follows:

- **light** - flammable grass and annual herbs;
- **medium** - scrub brush of lighter species; and
- **heavy** - timber, woodland, and heavier brush species.

Extent of Constraint

Almost all of Nevada County has been placed in the "very high" category of severity (see Figure 11 of the Open Space/Conservation Inventory). From Bridgeport straight-away southeast to Bear River, the central portion of the County east varies from "very high" to "high". From this imaginary boundary west, the County's classification is primarily "moderate" with some "high" and "very high" zones interlaced.

General Plan Impacts

Because all of eastern Nevada County and western Nevada County (up to the aforementioned imaginary boundary line) are afflicted with a "very high" fire hazard zone, any development in this entire area would potentially impact significant fire hazard zones. The growth and development of other areas in western Nevada County, such as: Penn Valley/Lake Wildwood; Higgins Corner/Lake of the Pines; Alta Sierra; and designated rural places, which are located in "very high" and "high" fire hazard zones, would also potentially impact significant fire hazard zones. With development and expansion comes population growth, which is one of several factors that influences the potential for fire hazard. The CDF has stated about Nevada County that, "The rapid population increase of the County continues to compound the potential for wildfires with each fire season (Nevada County General Plan, Technical Data, 1980). The main problem encountered during fires is the lack of adequate ingress and egress routes to the residential areas. Drafting a plan for development/expansion that adheres to the "State Responsibility Area Fire Safe Regulations", which covers "basic wildland fire protection standards of the California Board of Forestry" for "future design and construction", may be necessary.

General Plan Compliance

The following measures have been adopted in order to maintain an appropriate level of fire protection facilities and services for both *Community* and *Rural Regions*:

Local fire districts shall be encouraged to adopt ordinances that maintain high fire protection standards for all public and private development, including adequate access and water flow standards; the County will encourage the upgrading of facilities within existing fire protection districts, and encourage the expansion of existing districts or the formation of new districts where warranted by the population density allowed under the General Plan; and the County will cooperate with the California Department of Forestry, U.S. Forest Service, and local fire districts in fire prevention programs.

Specific elements of the Comprehensive Site Design Standards will address fire hazard issues in order that land use patterns and development standards shall minimize fire hazards appropriate to the region. Also, the County shall establish the office of County Fire Marshall, whose responsibilities will include coordination of development with respect to fire prevention and safety, and implementation of County fire safety programs, standards and procedures.

In those areas clearly shown to have a high fire hazard and/or lack adequate year-round fire protection facilities, the County shall maintain low-density land use designations (Rural or Forest) and encourage proper fire prevention methods in order to minimize the potential fire hazard. Additionally, a Nevada County Task Force on fire safety shall annually report to the Board of Supervisors on the County's fire safety and facilitate fire protection capabilities.

Fire protection and public safety facilities shall be included in the County's development impact fee program, as provided in the Public Facilities policies to provide for new facilities or upgrading of existing facilities necessary to serve new development.

The County shall promote the continued effectiveness and public awareness of the Nevada County Emergency Operational Plan, through the local Office of Emergency Services (OES), as the focus for planning for emergency evacuation of threatened population.

In conformance with the above policies, the Preliminary Draft General Plan Land Use Maps designate high fire hazard areas as Rural or Forest in order to limit density and provide for additional road access in rural areas.

The Preliminary Draft General Plan Land Use Maps also provide for adequate evacuation routes in areas of high avalanche hazard, fire hazard, and other natural hazards resulting from steep slopes. Consistent with the Emergency Operational Plan, the routes designated on the General Plan Land Use Maps as Interstates, freeways, highways, and other principal arterial routes shall be considered primary evacuation routes on a county-wide basis. Such routes provide the highest levels of capacity and contiguity and serve as the primary means for egress from the County.

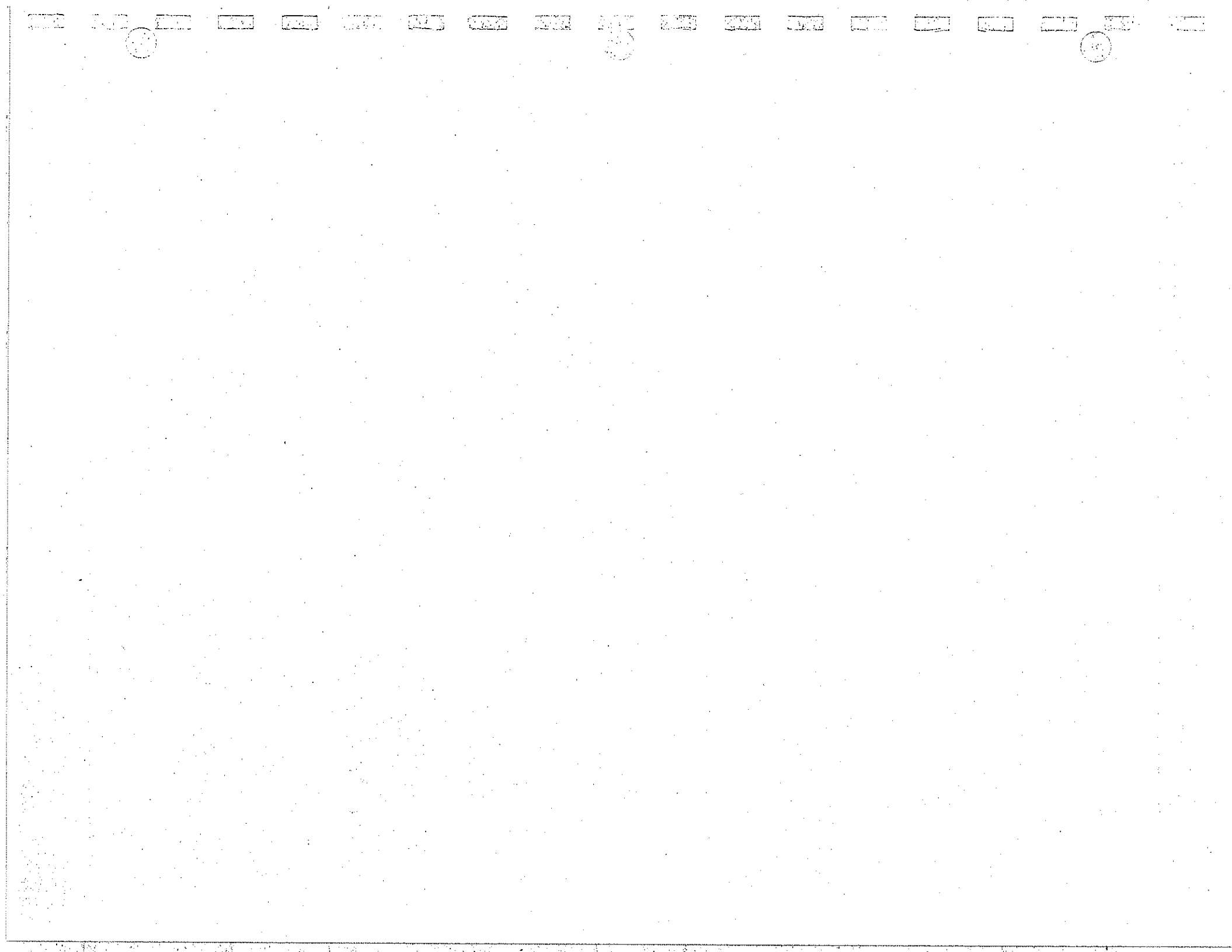
The routes designated on the General Plan Land Use Maps as minor arterial or major collector routes shall be considered secondary evacuation routes on a county-

wide basis. These routes supplement the primary evacuation routes, and provide egress from local neighborhood and communities.

Nevada County General Plan

Volume 2: Background Data and Analysis

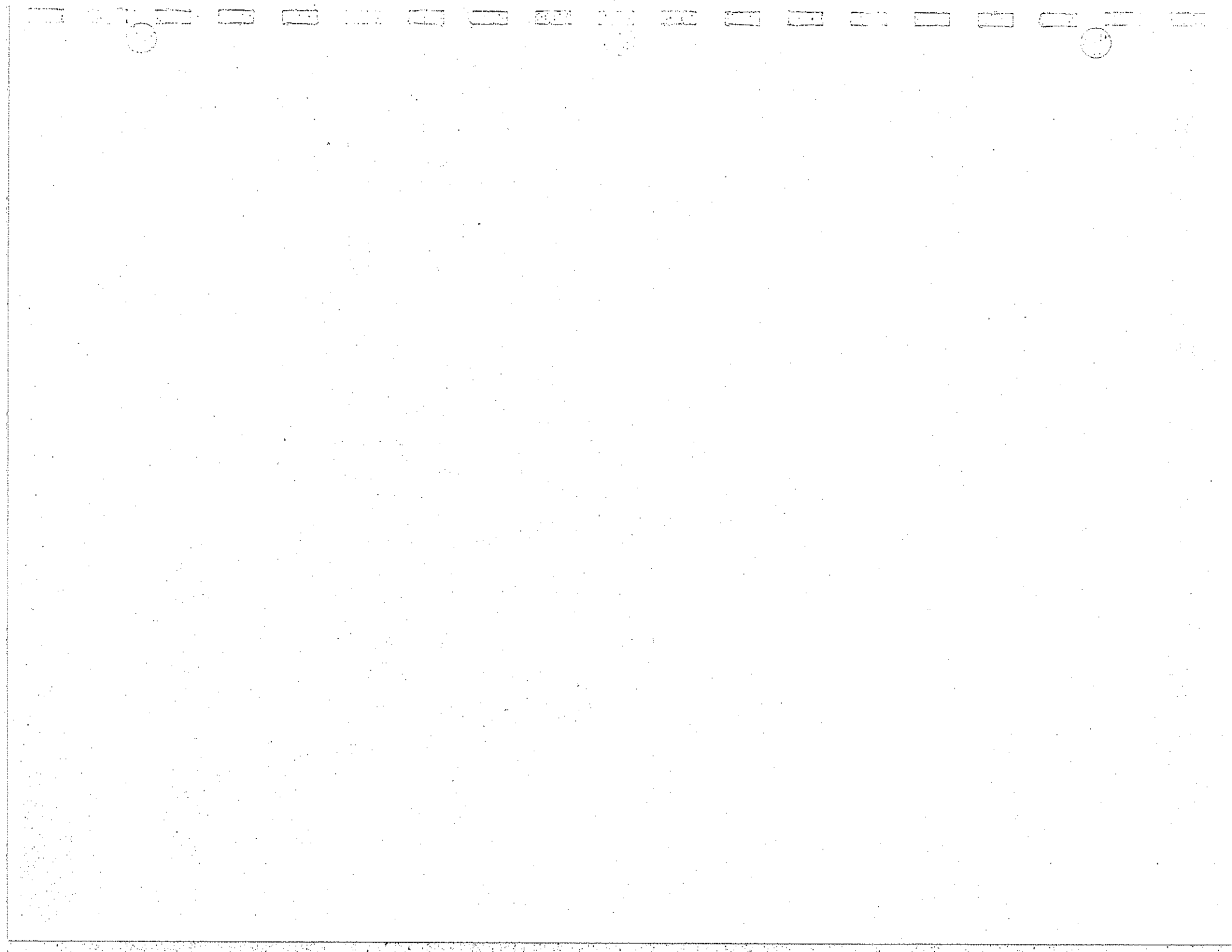
Section 6: Land Use, Circulation, and Infrastructure Analysis



Introduction

The correlation of land use, circulation and infrastructure are fundamental to the development of a sound, consistent plan which addresses the future needs of the County as it continues to grow. The analyses presented in this section of the General Plan identify the criteria used to determine future needs for the various types of land use necessary to provide for a balanced community, and needs for major roadway and other infrastructure improvements to support the land use pattern shown in the General Plan Land Use Maps, based upon the anticipated population and employment which that land use pattern would generate.

The circulation and infrastructure analyses build upon population and employment data generated by the land use needs analysis to determine what type and level of improvements would be required, at buildout of the General Plan, to provide for levels of service which are consistent with the policy direction of the General Plan. The results of the circulation and infrastructure analyses, as well as the land use needs analysis, are reflected in the location and amount of land shown in the General Plan Land Use Maps.



Chapter 1 Land Use

The Nevada County General Plan, in accordance with the Central Themes of the Plan, is based upon the concept of a balanced, self-sustaining community. This concept implies a balance between land use types providing housing, commercial services and employment. Also implied by the concept of a balanced community is a balance among the different types of housing, commercial and employment generating land uses. A final element of the balanced community concept is the ability to provide a sound long term basis for the County's economic health by ensuring that adequate non-residential land uses are provided, both for employment and for revenue generation.

The criteria used to establish a balanced land use pattern in the Nevada County General Plan are identified in the following sections. These criteria provide the base for determining specific land use needs for the land use types needed to support a balanced community. The criteria address four major components to determine land use needs: population based upon projected density of residential development; mix of dwelling unit types, particularly the ratio of single-family and multiple-family units; provision of sufficient employment opportunities as measured by a jobs/housing balance; and mix of non-residential development types to provide a balance among employment types, and different types of commercial areas to provide a range of goods and services.

Population and Residential Density

The following criteria were used to determine the buildout population for the General Plan, based upon the land use designations shown on the General Plan Land Use Maps:

Dwelling Units

The following densities in dwelling units per gross acre were used to generate dwelling unit data.

- Urban High Density Residential - 20 dwelling units per acre maximum within incorporated area's spheres of influence and 15 units per acre elsewhere.
- Urban Medium Density Residential - 6 dwelling units per acre
- Urban Single Family Residential - 2.5 dwelling units per acre
- Residential - 0.66 dwelling units per acre
- Estate - 0.33 dwelling units per acre
- Rural - 5 - 0.2 dwelling units per acre
- Rural - 10 - 0.1 dwelling units per acre
- Rural - 20 - 0.05 dwelling units per acre
- Rural - 30 - 0.033 dwelling units per acre
- Rural- 40 and Forest 40 - 0.025 dwelling units per acre
- Rural-160 and Forest 160 - 0.00625 dwelling units per acre

These figures represent gross acres. To provide figures for net acres, representing the actual developable area, a factor of 0.9 was applied to the number of dwelling units for the Rural-5 through Rural-160, Urban High Density, Urban Medium Density, and Forest categories, and a factor of 0.85 was applied to the dwelling units generated in the other categories. The resulting numbers provide the anticipated dwelling units for each residential land use type at buildout.

Population

A ratio of 2.15 persons per dwelling unit was used as the basis for generating population data. This is a weighted average for the 1990 U.S. Census figures of 2.4 persons per dwelling for the western County and 1.8 persons for the eastern part of the county

Dwelling Unit Types

The mix of dwelling unit types is an important consideration in the development of a balanced community. Of particular importance is the mix between single-family and multiple-family residential units, as a means of providing housing choice, as well as addressing the need for affordable housing, which typically requires higher densities of development. A criteria of 70+ percent single-family residential units and up to 30 percent multiple family residential units was used to establish the mix of dwelling unit types. This ratio is comparable to that for the State of California, which is a ratio of 33 percent for multiple-family units, and 67 percent for single-family units.

Jobs/Housing Balance and Employment Densities

The establishment of a balance between jobs and housing in the County is a fundamental component of a balanced community. The criteria used to measure a jobs/housing balance was a ratio of 1.2:1 or more which is comparable to the 1990 reported jobs/housing ratio for the State of California (and significantly above the 0.9:1 reported for Nevada County in 1990).

To establish the potential job generation of different land use types, a basis for establishing employment densities (number of employees per acre) is needed. The following building area ratios (square feet of building per acre of land) and employment ratios (employees per square feet of building area) were used to generate employment data.

- Commercial (Including Neighborhood, Community, Highway, Service and Rural) - A building area ratio of 0.25 and an employment ratio of 1:800. (For Community Commercial designations in the downtown areas of Grass Valley, Nevada City and Truckee, a building area ratio of 0.75 and an employment ratio of 1:800 was used to reflect the higher density of development in these areas.)

- Office-Professional - A building area ratio of 0.2 and an employment ratio of 1:400
- Business Park - A building area ratio of 0.2 and an employment ratio of 1:400
- Industrial - A building area ratio of 0.15 and an employment ratio of 1:600

These ratios are typical based upon national standards, and allow for an appropriate ratio of building to site area to provide necessary parking, loading and open space on site (except for the downtown area ratios, which assume more intensive building coverage.)

Mix of Non-Residential Development Types

To provide for an appropriate amount of land area to provide goods and services, as well as employment in a community, minimum ratios are established between population and acreage of various commercial and employment generating land use types. These ratios are based upon standard planning criteria which represent the need for certain levels of services provided by different types of shopping, such as neighborhood commercial areas for day-to-day goods, or community commercial areas for a wider range of goods associated with comparison shopping. These standard planning criteria also represent the need for a mix of employment types, including retail, service, office and manufacturing employment.

- Local Commercial (including Neighborhood and Rural) - 2.0 acres per 1000 persons.
- Community and Service Commercial - 5.0 acres per 1000 persons.
- Highway Commercial - No Specific Criteria
- Office-Professional - 1.0 acres per 1000 persons
- Business Park and Industrial - 15.0 acres per 1000 persons

These minimum ratios are consistent with national averages used as standard planning criteria; in some cases, such as Highway Commercial use which is not residence based, there is no typical ratio.

Land Use Needs and Buildout Characteristics of the General Plan

The land use needs resulting from application of the criteria in the previous sections are reflected in the land use pattern shown in the General Plan Land Use Maps. Two different Plan buildout scenarios using two different methodologies are provided below: manual tabulation of land use designations and computer-generated population projections using the County's geographic information system.

Manual Tabulation Buildout Projection

The manual tabulation projection reflects acreages as shown on the land use maps. Acreages were measured and tabulated by land use designation, and Table 1 summarizes this information, along with the projected dwelling units, population, and employment at buildout of the Nevada County General Plan (and assuming buildout of the current General Plans of Grass Valley, Nevada City, and Truckee within their current boundaries).

At buildout, the projected population of the County, not including "granny" units, would be 145,900 persons in 68,300 dwelling units. Based upon an additional allowance of 3% for "granny" units (which is the ratio for the County since 1983), the total buildout would be 150,300 in 70,400 dwelling units. Employment would be 93,500, with the largest job-generating land use designations being business park and industrial. Approximately 23% of the total dwelling units would be in the Urban High Density and Urban Medium Density designations, which provide for multiple-family housing. In addition, Tables 2 through 7 show the land use summary for the six Community Regions in Nevada County.

NEVADA COUNTY GENERAL PLAN BUILDOUT CHARACTERISTICS

TABLE 1
LAND USE CHARACTERISTICS
NEVADA COUNTY TOTAL

Land Use Designation	Acres	Dwelling Units	Population	Employment
Urban High Density Residential	596	8,200	24,240	
Urban Medium Density Residential	1,500	7,740	16,310	
Urban Single Family Residential	3,590	9,000	15,310	
Planned Residential Community	10,900	14,490	27,200	
Residential	9,980	5,780	11,750	
Estate	20,820	6,110	13,220	
Rural-5	44,150	8,030	17,120	
Rural-10	48,110	3,920	9,280	
Rural-20	33,200	1,515	3,260	
Rural-30	20,100	600	1,310	
Rural-40	47,200	1,080	2,370	
Rural-160	3,760	80	100	
Neighborhood Commercial	230			3,090
Community Commercial				
Downtown	80			3,265
Other	1,020			17,000
Highway Commercial	120			1,600
Service Commercial	40			480
Rural Commercial	90			1,225
Office-Professional	230			4,990
Business Park	2,030			44,070
Industrial	1,384			15,568
Forest	331,900	2,370	5,105	0
Public	5,700			2,160
Recreation	1,175	10		
Open Space	35,260	50	50	
Water Area	3,800			
TOTAL	625,929	68,300	145,900	93,498

NOTE: Totals generally reflect the criteria as found in this Chapter. However, in some instances, they have been adjusted to reflect different criteria as used by the cities and town, as well as the density of existing development.

TABLE 2
LAND USE CHARACTERISTICS
GRASS VALLEY COMMUNITY REGION

Land Use Designation	Acres	Dwelling Units	Population	Employment
Urban High Density Residential	250	4,860	11,665	
Urban Medium Density Residential	415	2,230	5,360	
Urban Single Family Residential	355	755	1,815	
Planned Residential Community	0	0	0	
Residential	4,435	2,495	5,990	
Estate	275	80	190	
Rural-5	0	0	0	
Rural-10	0	0	0	
Rural-20	0	0	0	
Rural-30	0	0	0	
Rural-40	0	0	0	
Rural-160	0	0	0	
Neighborhood Commercial	20			270
Community Commercial				
Downtown	55			2,245
Other	565			7,690
Highway Commercial	0			0
Service Commercial	0			
Rural Commercial	0			0
Office-Professional	160			3,440
Business Park	1,320			28,750
Industrial	805			8,770
Forest	0	0	0	0
Public	545			
Recreation	100			
Open Space	1,280			
Water Area	0			
TOTAL	10,580	10,420	25,020	51,165

TABLE 3 LAND USE CHARACTERISTICS NEVADA CITY COMMUNITY REGION				
Land Use Designation	**Acres**	**Dwelling Units**	**Population**	**Employment**
Urban High Density Residential	0	0	0	
Urban Medium Density Residential	156	840	2,010	
Urban Single Family Residential	515	1,095	2,625	
Planned Residential Community	0	0	0	
Residential	760	425	1,020	
Estate	1,935	540	1,295	
Rural-5	0	0	0	
Rural-10	0	0	0	
Rural-20	0	0	0	
Rural-30	0	0	0	
Rural-40	0	0	0	
Rural-160	0	0	0	
Neighborhood Commercial	0			0
Community Commercial				
Downtown	12			490
Other	43			585
Highway Commercial	33			450
Service Commercial	37			505
Rural Commercial	0			0
Office-Professional	29			630
Business Park	240			5,225
Industrial	63			685
Forest	0	0	0	0
Public	270			
Recreation	35			
Open Space	300			
Water Area	0			
TOTAL	4,420	2,900	6,960	8,570

TABLE 4 LAND USE CHARACTERISTICS LAKE WILDWOOD COMMUNITY REGION				
Land Use Designation	**Acres**	**Dwelling Units**	**Population**	**Employment**
Urban High Density Residential	0	0	0	
Urban Medium Density Residential	22	132	315	
Urban Single Family Residential	234	440	1,055	
Planned Residential Community	2,010	2,842	6,820	
Residential	0	0	0	
Estate	0	0	0	
Rural-5	0	0	0	
Rural-10	0	0	0	
Rural-20	0	0	0	
Rural-30	0	0	0	
Rural-40	0	0	0	
Rural-160	0	0	0	
Neighborhood Commercial	18			245
Community Commercial				
Downtown	0			0
Other	0			0
Highway Commercial	0			0
Service Commercial	0			0
Rural Commercial	0			0
Office-Professional	0			0
Business Park	0			0
Industrial	0			0
Forest	0	0	0	0
Public	40			
Recreation	0			
Open Space	85			
Water Area	0			
TOTAL	2,409	3,414	8,190	245

TABLE 5 LAND USE CHARACTERISTICS PENN VALLEY COMMUNITY REGION				
Land Use Designation	**Acres**	**Dwelling Units**	**Population**	**Employment**
Urban High Density Residential	20	360	865	
Urban Medium Density Residential	90	500	1,180	
Urban Single Family Residential	0	0	0	
Planned Residential Community	0	0	0	
Residential	595	330	800	
Estate	855	245	585	
Rural-5	0	0	0	
Rural-10	0	0	0	
Rural-20	0	0	0	
Rural-30	0	0	0	
Rural-40	0	0	0	
Rural-160	0	0	0	
Neighborhood Commercial	21			285
Community Commercial				
Downtown	0			0
Other	60			820
Highway Commercial	0			0
Service Commercial	0			0
Rural Commercial	0			0
Office-Professional	7			150
Business Park	9			195
Industrial	47			510
Forest	0	0	0	0
Public	25			
Recreation	80			
Open Space	34			
Water Area	0			
TOTAL	1,845	1,435	3,430	1,960

TABLE 6 LAND USE CHARACTERISTICS HIGGINS CORNER/LAKE OF THE PINES COMMUNITY REGION				
Land Use Designation	**Acres**	**Dwelling Units**	**Population**	**Employment**
Urban High Density Residential	23	310	745	
Urban Medium Density Residential	120	650	1,555	
Urban Single Family Residential	0	0	0	
Planned Residential Community	1,310	1,900	4,560	
Residential	590	330	790	
Estate	0	0	0	
Rural-5	0	0	0	
Rural-10	3	0	0	
Rural-20	0	0	0	
Rural-30	0	0	0	
Rural-40	0	0	0	
Rural-160	0	0	0	
Neighborhood Commercial	16			218
Community Commercial				
Downtown	0			0
Other	37			505
Highway Commercial	0			
Service Commercial	0			0
Rural Commercial	0			0
Office-Professional	17			370
Business Park	50			1,090
Industrial	9			98
Forest	0	0	0	0
Public	205			
Recreation	0			
Open Space	11			
Water Area	0			
TOTAL	2,391	3,190	7,650	2,281

TABLE 7 LAND USE CHARACTERISTICS TRUCKEE COMMUNITY REGION				
Land Use Designation	**Acres**	**Dwelling Units**	**Population**	**Employment**
Urban High Density Residential	278	2,220	2,840	
Urban Medium Density Residential	332	1,330	1,700	
Urban Single Family Residential	2,065	4,220	5,370	
Planned Residential Community	3,870	7,000	8,960	
Residential	364	360	460	
Estate	889	440	570	
Rural-5	787	150	190	
Rural-10	2,037	210	270	
Rural-20	0	0	0	
Rural-30	0	0	0	
Rural-40	0	0	0	
Rural-160	3,906	50	50	
Neighborhood Commercial	0			0
Community Commercial				
Downtown	0			0
Other	279			7,320
Highway Commercial	0			0
Service Commercial	0			0
Rural Commercial	0			0
Office-Professional	0			0
Business Park	0			0
Industrial	189			2,080
Forest	0	0	0	0
Public	1,600			2,160
Recreation	298	10	0	
Open Space	5,157	50	50	
Water Area	0			
TOTAL*	19,520	17,075	21,840	11,560

* Total includes planned communities, downtown study area and special study areas within Town of Truckee.

Geographic Information System Population Buildout Projections

The geographic information system population buildout projections are based on Plan land use map designations and assessor's parcel data. These projections only project future population. They incorporate existing parcelization into the analysis. Assumptions include buildout data from each of the three city's General Plans, dwelling units per gross acre, a 2nd unit factor, persons per dwelling unit, and buildable parcels based on assessor's valuation. Varying assumptions provide for a low, moderate, and high projection. The following table reflects the three projections:

NEVADA COUNTY GENERAL PLAN
POPULATION BUILDOUT CHARACTERISTICS
(GEOGRAPHIC INFORMATION SYSTEM)

Issue	Alternative I Low	Alternative II Moderate	Alternative III High
Nevada County	**154953**	**158,931**	**162,726**
Western County	128,056	131,819	135,471
Eastern County	26,897	27,112	27,255
Community Regions			
Grass Valley	33,900	33,900	33,900
Nevada City	6,400	6,400	6,400
Truckee	23,000	23,000	23,000
Penn Valley	2,615	2,693	2,779
Lake Wildwood	6,145	6,145	6,352
Higgins Corner/LOP	6,177	6,180	6,383

Chapter 2 Circulation

Introduction

California Government Code Section 65302 identifies the requirements for preparation of a Circulation element as part of the General Plan. This analysis is intended to provide the background relating to existing conditions and future requirements for the goals, objectives and polices of Chapter 4: Circulation, in Volume 1 of the General Plan. The analysis also identifies projected traffic volumes for the regional roadway system serving Nevada County based upon buildout of the proposed land use plan, and roadway improvements to the regional system which are necessary to maintain the level of service (LOS) criteria established in the Circulation policies of the General Plan. Information concerning existing conditions included in this analysis is an updated summary of the data contained in the *Existing Transportation Conditions Analysis,* prepared for the Nevada County Regional Transportation Plan and the Nevada County General Plan in August, 1991.

Nevada County's geography has led to distinctive development patterns in the eastern and western portions of the County. Western Nevada County's rolling and sometimes rugged foothill terrain is very attractive for residential and commercial developments due to the rural character of the area and the quality of life it affords.

The Grass Valley/Nevada City area has become the primary urban center in western Nevada County. This foothill area of the Sierra is a combination of tree-covered rolling hills and stream channels which have greatly affected road and utility locations. Western Nevada County is served by State Routes 20, 49 and 174.

The major transportation issues facing western Nevada County include the increased demand for transportation brought on by rapid growth and the funding of facilities and services to meet that demand.

Eastern Nevada County is known for its many recreational opportunities. This mountainous area of the Sierra Nevada offers a full range of winter and summer recreational activities such as skiing, camping and hiking. These recreational opportunities and the proximity of this area to Reno and Lake Tahoe increase its popularity as a tourist attraction.

The "Truckee Community" (including the Donner Lake area) is the major urban area for eastern Nevada County. The Truckee area has incorporated as a Town, which occurred March 23, 1993. In addition to being a station for rail freight and passenger service, Truckee is at the crossroads of Interstate 80 and State Routes 89 and 267. Interstate 80 is a major transcontinental route and the two state routes are the northern entrances to the Tahoe Basin.

The major transportation issues in Eastern Nevada County are related to the heavy volumes of regional traffic. Major arterial routes in eastern Nevada County

have peak period demands that exceed system capacities. Because of environmental and funding constraints, the potential for large scale highway construction to meet the demand is limited. While some highway construction may aid the situation, demand management strategies on a regional or sub-regional basis and enhancement of alternatives to the automobile provide other potential options.

Travel characteristics within the study area vary between the eastern and western County primarily due to their distinctive land use patterns. The eastern portion of the County contains several areas which attract more trips than they produce, such as the ski resorts and the Truckee shopping area. This land use pattern causes many trips to end within the area, but originate outside the area. Another prominent travel characteristic of the eastern County is the trip that passes through the area. This is due to the proximity of nearby origins and destinations such as Lake Tahoe, Reno and Sacramento and the connection provided by Interstate 80.

Existing land use patterns in the western portion of the County typically consist of more residential uses than commercial and industrial uses. A combination of large residential areas such as Lake of the Pines, Lake Wildwood and Alta Sierra with significant amounts of low density residential uses produces more trips than are attracted. This causes many trips to originate within the study area, but end outside the area, particularly for trips from home to work. CALTRANS has estimated that one third of the trips on Highway 49 in the southern part of the County have an origin or destination outside of the County.

Roadway System

Figure 1 displays the functional classification of roadways in Nevada County. The roadways are categorized into the following classifications:

Interstates and Freeways	Limited access highways.
Principal Arterials	Major roadways providing access from rural to urban areas and access to freeways.
Minor Arterials	Streets providing through service to industrial and commercial areas and between cities and/or providing access to highways and freeways.
Major and Minor Collectors	Streets that collect traffic from local streets within residential areas.
Locals	Streets whose primary purpose is to provide access to individual properties.

Figure 1 Functional Street Classification

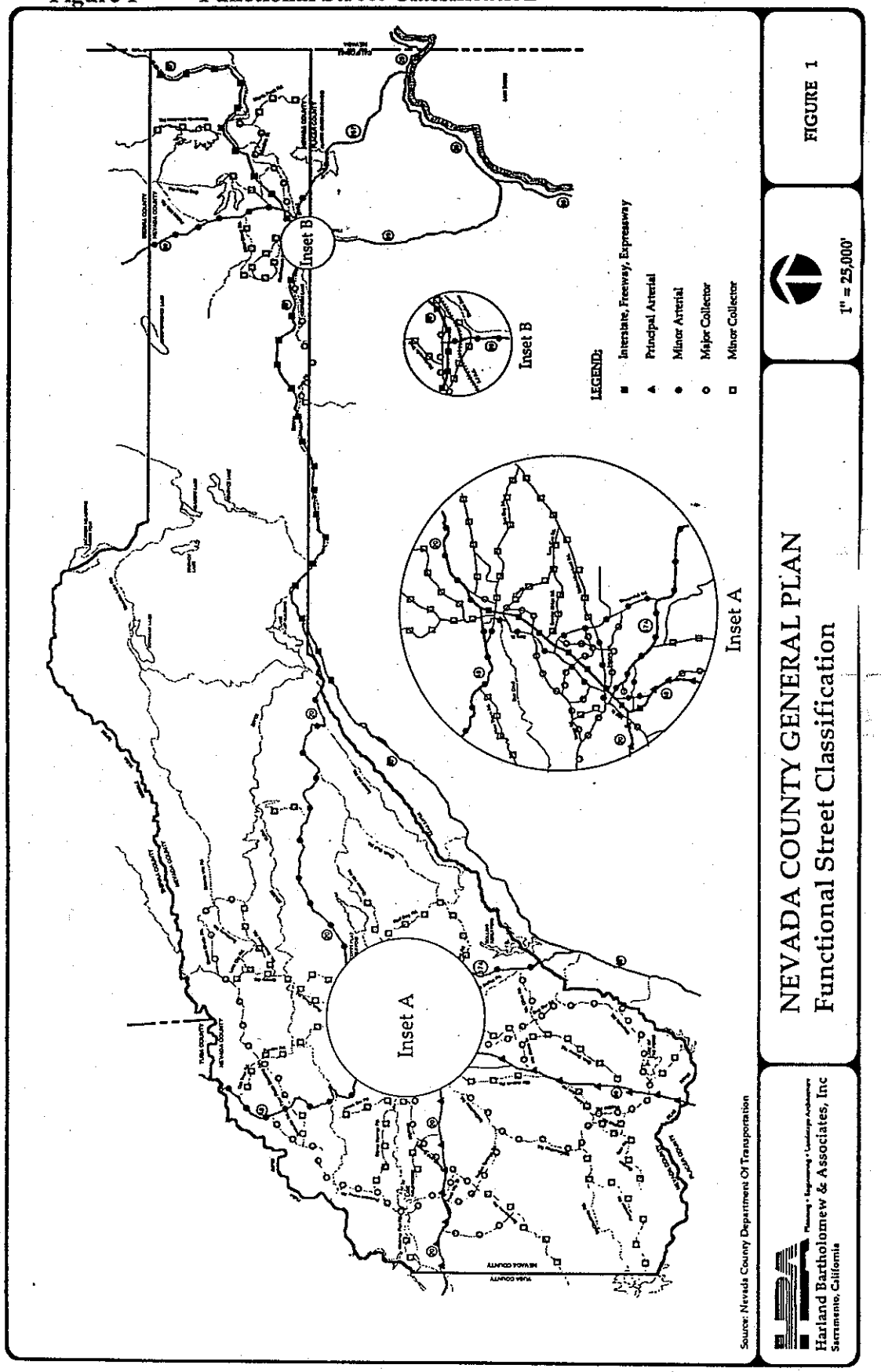


Figure 2 displays the 1990 average daily traffic volumes on major Nevada County roadways and Figure 3 displays the average daily level of service (LOS). Average daily traffic volumes are the measured, estimated or projected volumes occurring on a given roadway on an average daily basis. Level of service describes traffic flow conditions and varies qualitatively from LOS A (best) to LOS F (worst) as described below in Table 9.

TABLE 9
Level of Service Description

LOS	Description
A	Represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.
B	Stable flow, but the presence of other users in the traffic stream begins to be noticeable.
C	Stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.
D	Represents high density, but stable flow.
E	Represents operating conditions at or near the capacity level.
F	Represents forced or breakdown flow.

Source: *Highway Capacity Manual, Special Report 209,* Transportation Research Board. 1985.

The results shown on Figure 3 represent the average LOS over the course of a typical day, with specific delineation of those sections which are operating beyond their capacity. The capacity of a roadway is defined as the maximum number of vehicles that can pass over a given roadway in a given time period under prevailing roadway and traffic conditions. For the purposes of this General Plan analysis, the capacity of the roadways refer to the theoretical number of vehicles that can travel on the subject roadway on a daily, or 24 hour, basis. In reviewing the levels of service shown in Figure 3, some general conclusions can be made:

- As expected, virtually all of the capacity deficient areas were located in the more urbanized portions of the County, specifically the Nevada City/Grass Valley area and the Truckee area.
- Many of the identified problem areas are roadway segments which connect large residential developments to major arterials or highways. To improve these problem areas, capacity constraints would have to be reduced or removed. This could require improvements such as adding travel lanes or even constructing alternative access points.

Figure 2 Existing Average Daily Traffic Volumes

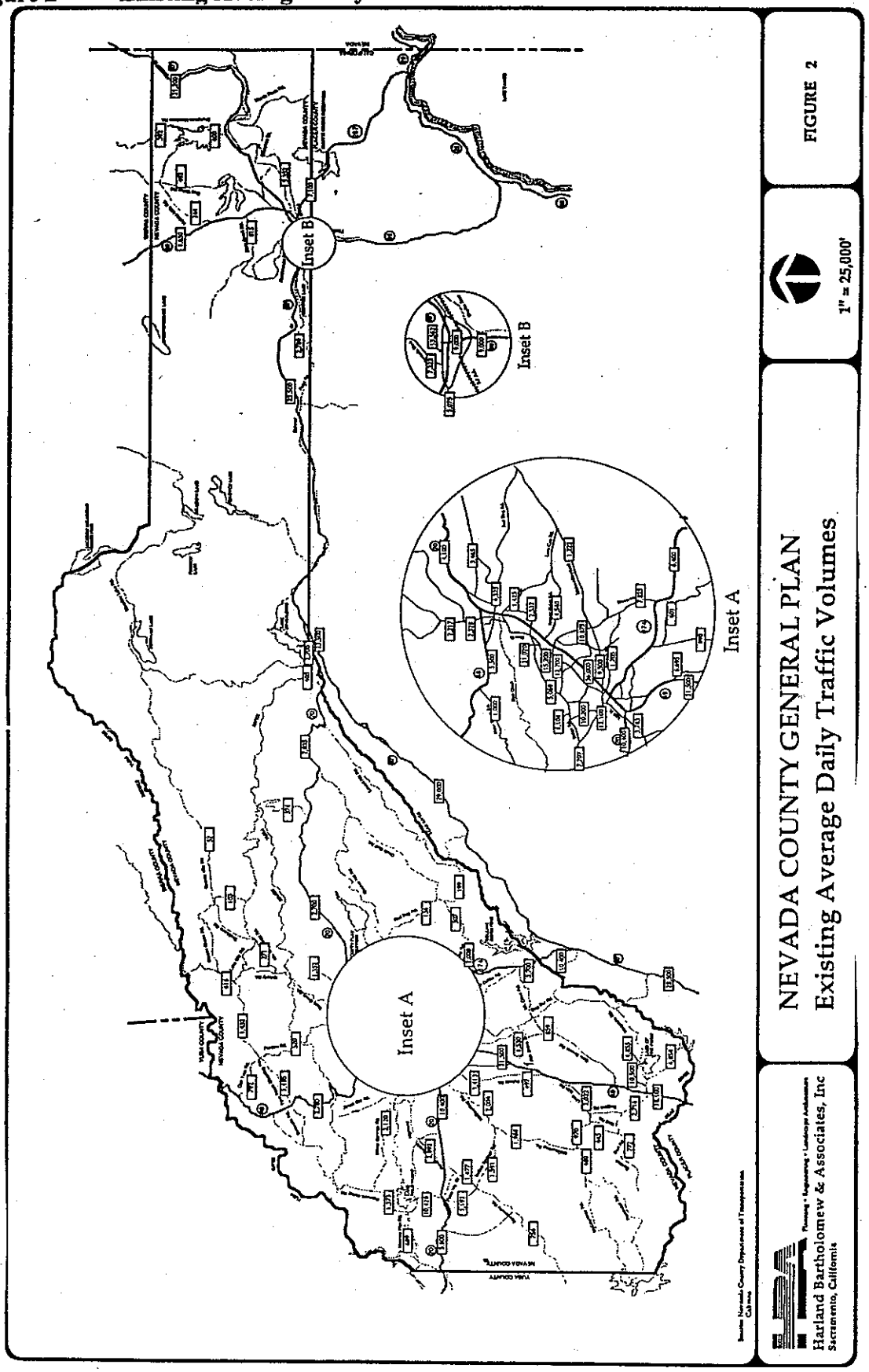
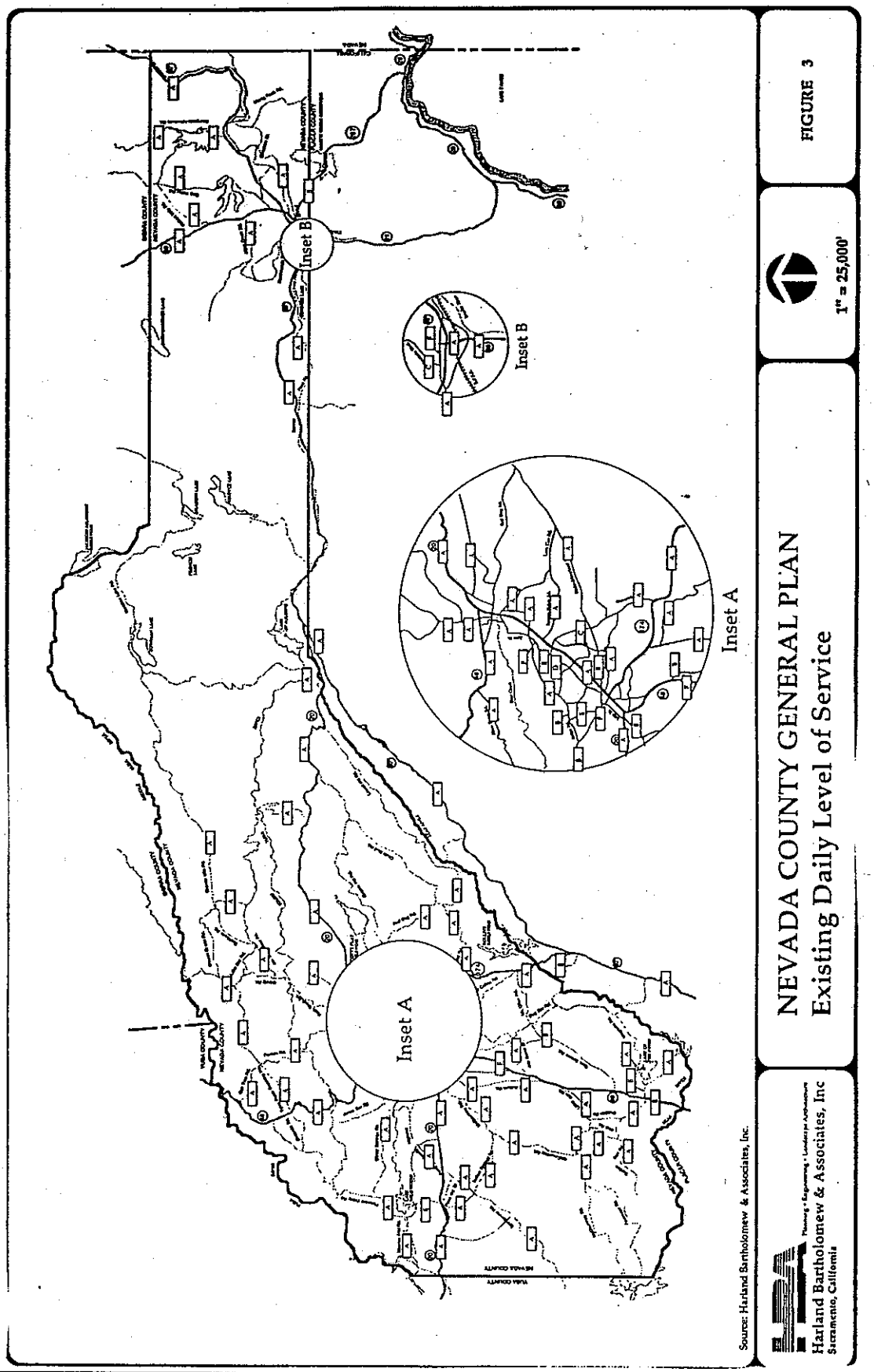


Figure 3 Existing Daily Level of Service



In some cases, existing levels of service may be less than reported in this study due to specific roadway conditions not meeting present design standards. The rural environment of Nevada County creates unique constraints in roadway capacity that affect the ability of the system to handle high volumes of traffic. Specific capacities are affected by roadway factors including number of lanes, lane widths, shoulder widths, topography, design speed and vehicle mix.

Based upon the level of service standards contained in Policies 4.1 and 4.2, the existing regional road system serving Nevada County generally provides acceptable service. However, the principal roads in the downtown areas of Grass Valley and Truckee have an existing daily level of service of less than "D," which is the minimum for community regions. Planning level of service analysis has indicated that the following roads may have segments that at times currently function at less than minimum General Plan Level of Service Standards.

- SR 49
- Combie Road
- Donner Pass Road
- Hughes Road
- Nevada City Highway
- Pleasant Valley Road

State Route 49, between Grass Valley and the Nevada-Placer County line has the lowest level of service, LOS F, and is operating well beyond its capacity. Future improvements to this route are anticipated by Caltrans and various studies are underway in the segment between McKnight Way and Lime Kiln Road. However, construction of these improvements is not expected within the next five years. In addition, capacity improvements are required on State Routes 89, 174 and 267.

Although development impact fees provide a significant means for funding roadway improvements to serve future growth, they are not available for solving existing deficiencies. Existing deficiency improvements require local funding programs and sources. Local funding programs are listed below along with their description:

- *Local Transportation Funds (LTF)* A revenue source generated by the 1/4 cent retail sales tax collected statewide. Funds are annually apportioned to each county based on the amount of tax collected in that county. Funds are then allocated by the transportation planning agency to claimants in a given area. In Nevada County, the NCTC has the authority to allocate LTF funds for roadway, transit, pedestrian and bikeway projects.
- *State Transit Assistance (STA)* Funds apportioned to each county for use in transportation planning and mass transportation projects as specified by the Legislature. STA funds are generated by the statewide gasoline sales tax and are allocated by the transportation planning agencies. Funds may be used to implement various transit recommendations.
- *Surface Transportation Program (STP)* This federal funding program was created by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The STP is a block grant type program that may be used by States and localities for any roads not functionally classified as local or rural collectors. Transit capital projects are also eligible under this program.

- *Congestion Mitigation and Air Quality (CMAQ)* Improvement Program This federal program directs funds toward transportation projects in Clean Air Act non-attainment areas for ozone and carbon monoxide. Qualifying projects will contribute towards meeting national ambient air quality standards. Jurisdictions that have no non-attainment areas can use these funds as if they were STP funds.
- *Local Option Sales Taxes* These taxes have been instituted in several counties to fund transportation improvements. A measure was previously defeated by Nevada County voters, but increasing congestion and limited state funding may reverse this vote. A local option sales tax for funding transportation was instituted by voters in Sacramento County. It appears that voters are generally receptive to such a tax when specific projects have been identified.
- *Local Option Motor Vehicle Fuel Taxes* These taxes can be implemented by a two-thirds endorsement of Nevada County voters and an agreement between applicable agencies on the amount of tax and allocation of revenues.
- *Conditions of Development* Conditions of approval may be placed on proposed development projects which contributes to a transportation system impact. A development project could be conditioned to assist in the implementation of any improvement directly related to the impact created by development of the project.
- *Benefit Assessment District* These districts allow local governments to recover the costs of public improvements from property owners benefiting from the improvements project. The assessment is based on the premise that the transportation improvement projects enhances the value of the affected property. Assessments are enacted according to a zone of benefit, with each affected parcel being assessed a specified dollar amount. The amount of revenue generated from an assessment district is dependent on the cost of its proposed public improvements.
- *Mello-Roos Community Facilities District* These districts provide for the issuance of tax-free municipal bonds by creating a special tax assessment district to repay the debt. Local jurisdictions may form the district and levy a special tax after two-thirds approval of the voters (or if uninhabited, two-thirds of the land owners) within the proposed district. Total revenues are dependent on the costs of specifically proposed projects.

In order to forecast future conditions of the street system, a travel demand model was developed for use in the Nevada County General Plan and Regional Transportation Plan updates. The model, which was developed using the MINUTP software, generates travel demand forecasts based on land use and street network data. Details of the process used along with the model validation and development techniques and assumptions are identified in *Technical Memorandum: Traffic Model Validation -Final Report,* December 1991.

Subsequent to these travel demand modeling efforts, a more recent model has been developed focusing on the Nevada City/Grass Valley area. This model has also been used to assist in developing estimates for future traffic volumes within the core area.

The traffic model travel demand forecasts were developed using buildout land use data based on measured acreage from the General Plan Land Use Maps and criteria for converting land use acreages to households, population and employment. Figure 4 displays the adjusted buildout travel demand forecasts from the MINUTP modeling process for the regional roadway system.

These traffic volumes were adjusted by first applying mathematical procedures to the forecast traffic volumes from the county-wide model. These procedures adjust the forecast traffic volume relative to the percent or difference between the existing base year traffic forecast and actual traffic counts. Next, a comparison was made between the adjusted county-wide traffic volumes and those generated by the core area model. Finally, a traffic volume was chosen from the adjusted county-wide model volumes or the core area volumes. In a few limited cases, a hybrid volume was developed based on comparing the adjusted county-wide model or core area model volume to existing traffic counts.

Using these forecasts, the major roadways were analyzed to determine the LOS at buildout. The first step in this analysis was to compare the travel demand forecasts with the planning service volumes shown in Table 10. The planning service volumes are general and are not roadway specific.

The daily service volumes shown in Table 10 were developed by Harland Bartholomew & Associates (HBA), Barton-Aschman Associates (BA) and County staff. Initial tables were developed by BA relating capacity for each roadway classification to the level of development in the surrounding area. (See Appendix A at the end of this chapter.) HBA and County staff used these tables as the initial starting point and, based on local experience, further refined the capacities as presented in Table 10 to reflect the particular roadway conditions in Nevada County.

As part of the analysis for the General Plan, several additional roadways not included in the existing road system were tested as alternatives to determine whether they would relieve the demand on segments of the existing system where forecast demand exceeds existing capacity. Several of the additional roadways tested failed to provide benefits to the regional road system and therefore were not included in the recommended network. These alternatives included:

- **Nevada City Bypass** - Various two-lane alignments between Gold Flat Road and Red Dog Road were tested in addition to alignments between Sacramento Street and Willow Valley Road. The location of this new route did not improve circulation for regional traffic; however, it may improve local traffic circulation.

- **Deerfield Bypass** - The extension of Deerfield Drive to Donner Pass Road was analyzed as an alternative route for Donner Pass Road traffic. This route did attract local traffic but did not benefit regional traffic.

- **Extension of Brunswick Road to Ridge Road** - Testing an east-west connection from Brunswick Road to Ridge Road indicated little improvement for regional traffic.

- **New connection between Rough and Ready Highway and Highway 20** (Grass Valley Western Bypass) - A north-south connection between these two routes was tested as a possible parallel route for Highway 49 traffic. Even with additional development west of Grass Valley, particularly in the New Town Reserve, the new route did not attract a significant level of traffic to warrant inclusion as a future improvement.

Figure 4 General Plan Buildout ADT Volumes

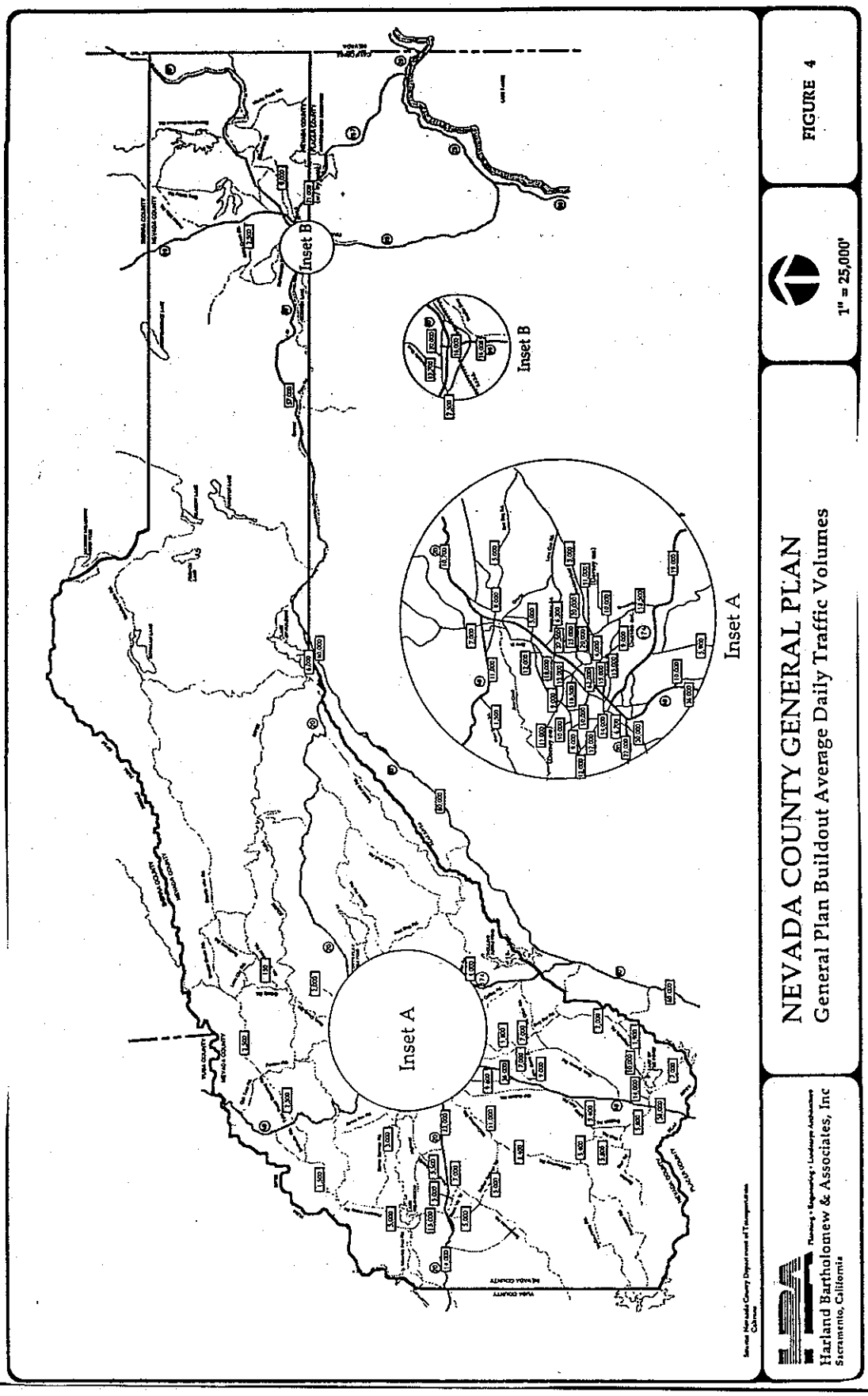


TABLE 10
Daily Planning Service Volume Criteria

Facility Type[1]	Functional Class	Lanes	Area Type[2]	LOS A	LOS B	LOS C	LOS D	LOS E
1	Interstate and Freeway	4	all	59,400	69,300	79,200	89,100	99,000
		6	all	89,100	103,950	118,800	133,650	148,500
2	Principal Arterial	2	all	11,100	12,950	14,800	16,650	18,500
		4	all	22,200	25,900	29,600	33,300	37,000
		6	all	33,300	38,850	44,400	49,950	55,500
3	Minor Arterial	2	MU- S	9,300	10,850	12,400	13,950	15,500
		2	R	6,600	7,700	8,800	9,900	11,000
		4	MU -S	18,600	21,700	24,800	27,900	31,000
		4	R	13,200	15,400	17,600	19,800	22,000
		6	all	27,900	32,550	37,200	41,850	46,500
4	Major Collector	2	all	6,600	7,700	8,800	9,900	11,000
		4	all	13,200	15,400	17,600	19,800	22,000
5	Minor Collector	2	all	5,700	6,650	7,600	8,550	9,500
		4	all	11,400	13,300	15,200	17,100	19,000
6	Ramp	1	all	6,000	7,000	8,000	9,000	10,000

1 Facility type (1-6) may not always directly coincide with functional classification of individual road segments.

2 MU = Mixed Urban area type
S = Suburban area type
R = Rural area type

- **Extension of McKnight Way to SR 174** - This improvement can only improve regional traffic circulation with an alignment through Empire Mine State Park. Therefore, this new route was not included as a future improvement.
- **Extension of LaBarr Meadows Road to SR 174** - This improvement would also require an alignment through Empire Mine State Park and, therefore, was not included as a future improvement.

Table 11 presents the results of the capacity analysis. The table includes the level of improvement required to maintain the policy level of service. In some instances, the projected traffic volume was only slightly above the policy level of service. In these cases, indicated by an * in the table, minor improvements referred to as spot improvements were recommended. These spot improvements could include shoulder widening, channelization or intersection turn lane additions.

Table 11
Daily Level of Service Analysis
General Plan Buildout (1)

Roadway	Segment	Facility Type	Area Type	Buildout Volume	Buildout w/o Imp. Lanes	VC	LOS	Buildout w/Imp. Lanes	VC	LOS
I-80	Placer Co. Line to SR 174	1		60,000	4	0.61	B			
I-80	SR 174 to SR 20	1		60,000	4	0.61	B			
I-80	SR 20 to SR 89	1		57,000	4	0.58	A			
SR 20	Yuba Co. Line to Pleasant Valley Rd.	2	R	14,000	2	0.76	C			
SR 20	Pleasant Valley Rd. to SR 49	2	S	22,000	2	1.19	F	4	0.59	A
SR 20	SR 49 to Willow Valley Rd.	2	R	10,700	2	0.58	A			
SR 49	Placer Co. Line to Alta Sierra Dr.	2	R	36,000	2	1.95	F	4	0.97	E
SR 49	Alta Sierra Dr. to McKnight Way	2	S	38,000	2	2.05	F	4	1.03	E
SR 49	W. Broad St. to Newtown Rd.	3	S	11,000	2	0.71	C			
SR 49 NB Ramp	Empire Street to 49	6	MU	17,600	1	1.76	F**			
SR 49 SB Ramp	49 to SR 20	6	MU	22,250	1	2.22	F**			
SR 89	Placer Co. to I-80	3	S	16,000	2	1.03	F	4	0.52	A
SR 174	You Bet Rd. to Brunswick Rd.	3	S	19,000	2	1.23	F	4	0.61	B
SR 267 (w/bypass)	Placer Co. to I-80	3	S	21,000	2	1.35	F	4	0.68	B
SR 20	Bowman Lake Rd. to I-80	3	R	6,000	2	0.55	A			
SR 20/49	Grass Valley to Nevada City	1	MU	62,000	4	0.63	B			
Alder Creek Rd.	Fjord Rd. to SR 89	5	R	2,500	2	0.26	A			
Allison Ranch Rd.	McCourtney Rd. to SR 49	5	S	9,600	2	1.01	F	2*	0.83	D
Alta Sierra Dr.	SR 49 to Ball Rd.	4	S	8,500	2	0.82	D	2	0.77	C
Alta Sierra Dr.	Ball Rd. to Dog Bar Rd.	4	S	7,000	2	0.64	B			
Banner Ridge-Lava Cap	SR 49 to Red Dog Rd.	5	S	6,300	2	0.66	B			
Bennett Rd.	SR 20/49 to Sutton Way	4	MU	13,000	2	1.37	F	4	0.68	B
Bennett Rd.	Sutton Way to Brunswick	5	MU	8,000	2	0.84	D			
Bitney Springs Rd.	Pleasant Valley Rd. to R & R Hwy.	5	R	3,000	2	0.32	A			
Boulder Street	SR 49 to Red Dog Rd.	4	MU	8,000	2	0.84	D			
Brunswick Rd.	SR 49/20 to Sutton Way	3	MU	37,500	6	0.81	D			
Brunswick Rd.	Sutton Way to Old Tunnel	3	MU	25,000	2	1.61	F	4	0.81	D
Brunswick Rd.	Old Tunnel to Idaho-Maryland Rd.	3	MU	20,000	2	1.29	F	4	0.65	B
Brunswick Rd.	Idaho-Maryland Rd. to SR 174	3	MU	18,500	2	1.19	F	4	0.60	A
Centennial Dr.	Idaho-Maryland to E. Bennett St.	4	MU	9,000	2	0.82	D			
Combie Rd.	SR 49 to Magnolia Rd.	4	MU	18,000	2	1.60	F	4	0.81	D
Combie Rd.	Magnolia Rd. to end	4	S	7,000	2	0.64	B			
Dog Bar Rd.	LaBarr Meadows Rd. to Carrie Dr.	4	S	7,000	2	0.64	B			
Dog Bar Rd.	Carrie Dr. to Magnolia Rd.	4	R	2,000	2	0.18	A			
Donner Pass Rd.	Northwoods Blvd. to Commercial Row	4	MU	20,000	2	1.82	F	4*	0.80	C
Donner Pass Rd.	Donner Lake Dr. to I-80	4	S	7,500	2	0.68	B			
Dorsey Dr.	Nevada City Hwy. to SR 49/20	4	MU	18,500	2	1.68	F	4	0.84	D
Dorsey Dr.	SR 49/20 to Sutton Way	4	MU	20,000	2	1.82	F	4*	0.80	C
Dorsey Dr. (ext.)	Sutton Way to Brunswick Rd.	4	MU	18,000	0	na	na	4	0.82	D
Dorsey Dr. (ext.)	Nevada City Hwy. to Ridge Rd.	4	MU	11,000	0	na	na	2*	0.88	D
E. Lime Kiln Rd.	SR 49 to Alexandra Way	5	S	2,600	0	na	na	2	0.27	A
Glenshire Dr.	Truckee River to SR 267	4	S	9,000	2	0.82	D			
Gold Flat Rd.	Gracie Road to SR 20/49	4	MU	5,000	2	0.45	A			
Hughes Rd.	Ridge Rd. to Main St.	4	MU	10,000	2	0.91	E	2*	0.80	C

Table 11, cont'd.

Roadway	Segment	Facility Type	Area Type	Buildout Volume	Buildout w/o Imp. Lanes	VC	LOS	Buildout w/Imp. Lanes	VC	LOS
Idaho-Maryland Rd.	SR 49/20 to Sutton Way	4	MU	15,000	2	1.36	F	4	0.68	B
Idaho-Maryland Rd.	Sutton Way to Brunswick Rd.	4	MU	4,000	2	0.36	A			
Idaho-Maryland Rd.	Brunswick Rd. to Banner Ridge	5	S	5,000	2	0.53	A			
Indian Springs Rd.	SR 20 to Spenceville Rd.	4	R	5,000	2	0.45	A			
Indian Springs Rd.	Spenceville Rd. to McCourtney	4	R	5,000	2	0.45	A			
LaBarr Meadows Rd.	McKnight Way to Dog Bar Rd.	4	S	10,000	2	0.91	E	2*	0.80	C
Lime Kiln Rd.	McCourtney Rd. to SR 49	5	S	5,400	2	0.57	A			
Loma Rica Dr.	Brunswick Rd. to Charles Dr.	5	MU	10,000	2	1.05	F	2*	0.87	D
Magnolia Rd.	Combie Rd. to E. Hacienda Dr.	4	S	10,000	2	0.91	E	2*	0.80	C
Magnolia Rd.	E. Hacienda Dr. to Dog Bar Rd.	4	S	1,900	2	0.17	A			
McCourtney Rd.	Lime Kiln Rd. to Indian Springs Rd.	4	R	8,400	2	0.76	C			
McCourtney Rd.	Indian Springs Rd. to Old Auburn Rd.	4	R	11,000	2	1.00	E	3	0.88	C
McCourtney Rd.	Old Auburn Rd. to SR 20	4	MU	22,000	2	2.00	F	4	1.00	E
Mill Street	W. Main St. to McCourtney Rd.	5	MU	6,700	2	0.71	C			
Nevada City Hwy.	Dorsey Dr. to Brunswick Rd.	3	MU	15,000	2	0.97	E	2*	0.88	D
Nevada City Hwy.	Brunswick Rd. to Gates Place	3	MU	18,000	2	1.16	F	4	0.58	A
Nevada City Hwy.	Gates Place to Ridge Road	3	MU	12,000	2	0.77	C			
Newtown Rd.	Bitney Springs Rd. to SR 49	5	R	1,500	2	0.16	A			
No. Bloomfield Rd.	SR 49 to Lake Vera-Purdon Rd.	5	S	7,000	2	0.74	C			
No. Bloomfield Rd.	Lake Vera-Purdon Rd. to Yuba River	5	R	2,000	2	0.21	A			
No. Bloomfield Rd.	Yuba River to Graniteville	5	R	150	2	0.02	A			
Northwoods Blvd.	Trout Creek to Donner Pass Rd.	5	S	13,700	2	1.44	F	4	0.72	C
Penn Valley Dr.	Pleasant Valley Rd. to Spenceville Rd.	4	S	3,000	2	0.27	A			
Penn Valley Dr.	Spenceville Rd. to SR 20	4	S	7,000	2	0.64	B			
Pleasant Valley Rd.	SR 20 to Lake Wildwood Dr.	4	S	15,000	2	1.36	F	3	0.68	B
Pleasant Valley Rd.	Lake Wildwood Dr. to Bitney Springs Rd.	4	S	5,000	2	0.45	A			
Pleasant Valley Rd.	Bitney Springs Rd. to SR 49	4	R	1,500	2	0.14	A			
Rattlesnake Rd.	SR 174 to Tiger Lily Lane	5	R	5,900	2	0.62	B			
Rattlesnake Rd.	Tiger Lily Lane to Dog Bar Rd.	5	R	1,800	2	0.19	A			
Red Dog Rd.	Boulder St. to You Bet Rd.	5	S	5,000	2	0.53	A			
Ridge Rd.	R & R Hwy. to Alta St.	4	MU	9,000	2	0.82	D			
Ridge Rd.	Alta St. to Hughes Rd.	4	MU	10,000	2	0.91	E	2*	0.80	C
Ridge Rd.	Hughes Rd. to Nevada City Hwy.	4	MU	9,000	2	0.82	D			
Rough & Ready Hwy.	SR 20 to Bitney Springs Rd.	4	R	5,500	2	0.50	A			
Rough & Ready Hwy.	Bitney Springs Rd. to Ridge Rd.	4	S	12,000	2	1.09	F	4	0.55	A
Rough & Ready Hwy.	Ridge Rd. to Grass Valley city limits	4	S	12,000	2	1.09	F	4	0.55	A
Tyler Foote Crossing Rd.	SR 49 to Lake City Rd.	4	R	2,500	2	0.23	A			
W. Main St.	E. Main St. to Alta St.	3	MU	14,000	2	0.90	D			
Wolf Rd.	Lime Kiln Rd. to SR 49	4	R	5,800	2	0.53	A			
You Bet Rd.	SR 174 to Red Dog Rd.	5	R	4,000	2	0.42	A			

* Additional spot improvements to increase capacity to 17,000 for a 2 lane Minor Arterial; 12,500/25,000/37,500 for a 2/4/6 lane Major Collector; and 11,500/23,000 for a 2/4 lane Minor Collector.

** Additional study required to accommodate projected traffic volumes at the Empire interchange with SR 20/49.

(1) Transportation infrastructure improvements assumed in future network to produce Table 11 and 12 results:

1. Dorsey Drive Interchange w/SR 49/20
2. Dorsey Drive Extensions to Ridge Road and Brunswick Road
3. Centennial Drive to Bennett Road

Table 11 displays data for the improved roadway network needed to support buildout of the General Plan, as identified through use of the travel demand model, as well as road segment data for locations not needing future improvement. Improvements to the existing road network are summarized in Table 12.

TABLE 12

Road Improvement Summary

Roadway	Segment	Facility Type(1)	Funcitonal Class	Existing Lanes	Im-proved Lanes
SR 20	Pleasant Valley to SR 49	2	Prin. Art.	2	4
SR 49	Placer Co. to McKnight	2	Prin. Art.	2	4
SR 89	Placer Co. to I-80	3	Min. Art.	2	4
SR 174	You Bet to Brunswick	3	Min. Art.	2	4
Allison Ranch Road	McCourtney to SR 49	5	Min. Col.	2	2*
Bennett Road	SR 20/49 to Sutton Way	5	Min. Col.	2	4
Brunswick	SR 20/49 to SR 174	3	Min. Art.	2	4
Centennial Drive	Whispering Pines to Bennett	4	Maj. Col.	0	2
Combie Road	SR 49 to Magnolia Road	4	Maj. Col.	2	4
Donner Pass Road	Northwoods to Commercial	4	Maj. Col.	2	4*
Dorsey Drive	Nev City Hwy to SR 20/49	4	Maj. Col.	2	4
Dorsey Drive (ext)	SR 20/49 to Sutton Way	4	Maj. Col.	2	4*
Dorsey Drive (ext)	Sutton Way to Brunswick	4	Maj. Col.	0	4*
Dorsey Drive (ext)	Nev City Hwy to Ridge	4	Maj. Col.	0	2*
Hughes Road	Ridge to Main Street	4	Maj. Col.	2	2*
Idaho-Maryland Rd.	SR 20/49 to Sutton Way	4	Maj. Col.	2	4
LaBarr Meadows Rd	McKnight Way to Dog Bar	4	Maj. Col.	2	2*
Loma Rica Drive	Brunswick to Charles	5	Min. Col.	2	2*
Magnolia Road	Combie to E. Hacienda	4	Maj. Col.	2	2*
McCourtney Road	Ind. Springs to Old Aub.	4	Min. Col.	2	2*
McCourtney Road	Old Aub. to SR 20	4	Min. Col.	2	4
Nevada City Hwy	Dorsey to Brunswick	3	Min. Art	2	2*
Nevada City Hwy	Brunswick to Gates Place	3	Min. Art.	2	4
Northwoods Blvd.	Trout Cr. to Donner Pass	5	Min. Col.	2	4
Pleasant Valley Road	SR 20 to Lake Wildwood	4	Maj. Col.	2	3
Ridge Road	Alta to Nev City Highway	4	Maj. Col.	2	2*
Rough & Ready Hwy	Bitney Springs to GV limits	4	Maj. Col.	2	4

(1) See Table 10 for description of Facility Type

As indicated in Table 11, construction of the Dorsey Drive interchange with SR 20/49 as proposed in the Caltrans Project Study Report, along with improvements to the Empire-SR 20/49 interchange are needed. Future analysis is needed at the Empire Street interchange with SR 20/49. Due to the complexity of this particular issue, it is not possible to recommend a long-term solution given the nature of this county-wide analysis. A corridor study or interchange study followed by a Project Study Report per Caltrans procedures is needed.

The Nevada County Transportation Commission is currently preparing a subregional transportation study for the Nevada City/Grass Valley area, and it is anticipated that additional recommended improvements resulting from that Study may be incorporated into the Nevada County General Plan or some improvements may be found to be unnecessary. For example, preliminary projections from the subregional traffic model indicate that State Route 49 between Grass Valley and Nevada City exhibits lower volumes than those projected by the County-wide model used in this General Plan analysis. These lower volumes will improve upon the LOS E shown in Table 11.

Transit Facilities

Public transit facilities in Nevada County are the responsibility of the County Department of Services for Transit, Aviation, and Recreation (STAR). Public transit in Nevada County is made up of "Fixed-Route Services" and "Specialized Services". Figure 5 displays the service areas of each fixed-route transit service in the County. The following descriptions summarize the fixed-route services operating in the County.

Gold Country Stage (GCS) is a fixed route system which provides hourly service primarily in and between Nevada City and Grass Valley. New routes have recently been added to serve the Highway 20 corridor between Grass Valley and Penn Valley and to serve the Highway 49 corridor between Grass Valley and Lake of the Pines, with connections for Placer County Transit service.

THE BUS is a bus service operating along Highway 89 between the Truckee Intermodal Transportation Center to Tahoe City. It is funded jointly by Placer County and the Town of Truckee.

Specialized services are another form of public transit in Nevada County. This type of service is demand responsive, with no fixed routes or time schedule. This type of service typically provides transportation for elderly and handicapped residents. The following descriptions summarize the specialized services operating in the County.

Dial-A-Ride is a demand-based service operated through a non-profit contract with Durham Transportation, Inc. The California Alta Regional, Inc. subsidizes elderly, handicapped and disabled passengers, but does not directly subsidize the overall operation of the service.

Gold Country Telecare (GCT) is a private, non-profit organization serving elderly, handicapped and disabled patrons. Passengers are transported by full-sized vans, mini-vans, or station wagons to shopping and medical appointments.

High Sierra Senior Services (HSSS) is also a demand-based service for elderly, handicapped and disabled passengers. The service area is confined to the eastern portion of Nevada County. The service operates two vans run by the Tahoe Forest Hospital in Truckee.

Based on General Plan buildout, demand for transit service can be expected to increase with population. The primary growth areas are currently served by the fixed route services or can be served by logical extensions of existing services such as from Highway 20 in the Penn Valley areas to the proposed New Town Reserve.

Another aspect related to the future conditions of transit services is the desire to reduce dependency on the automobile. In order for public transportation services to be a viable alternative to the private automobile, incentives must be provided. Transit services must be inexpensive, comfortable, convenient and reliable. The results of increased transit ridership are reduced congestion and improved air quality. The Nevada County Transportation Commission has begun the preparation of a Transit Marketing Plan for the Gold Country Stage service which will seek to increase ridership and improve public awareness of the services.

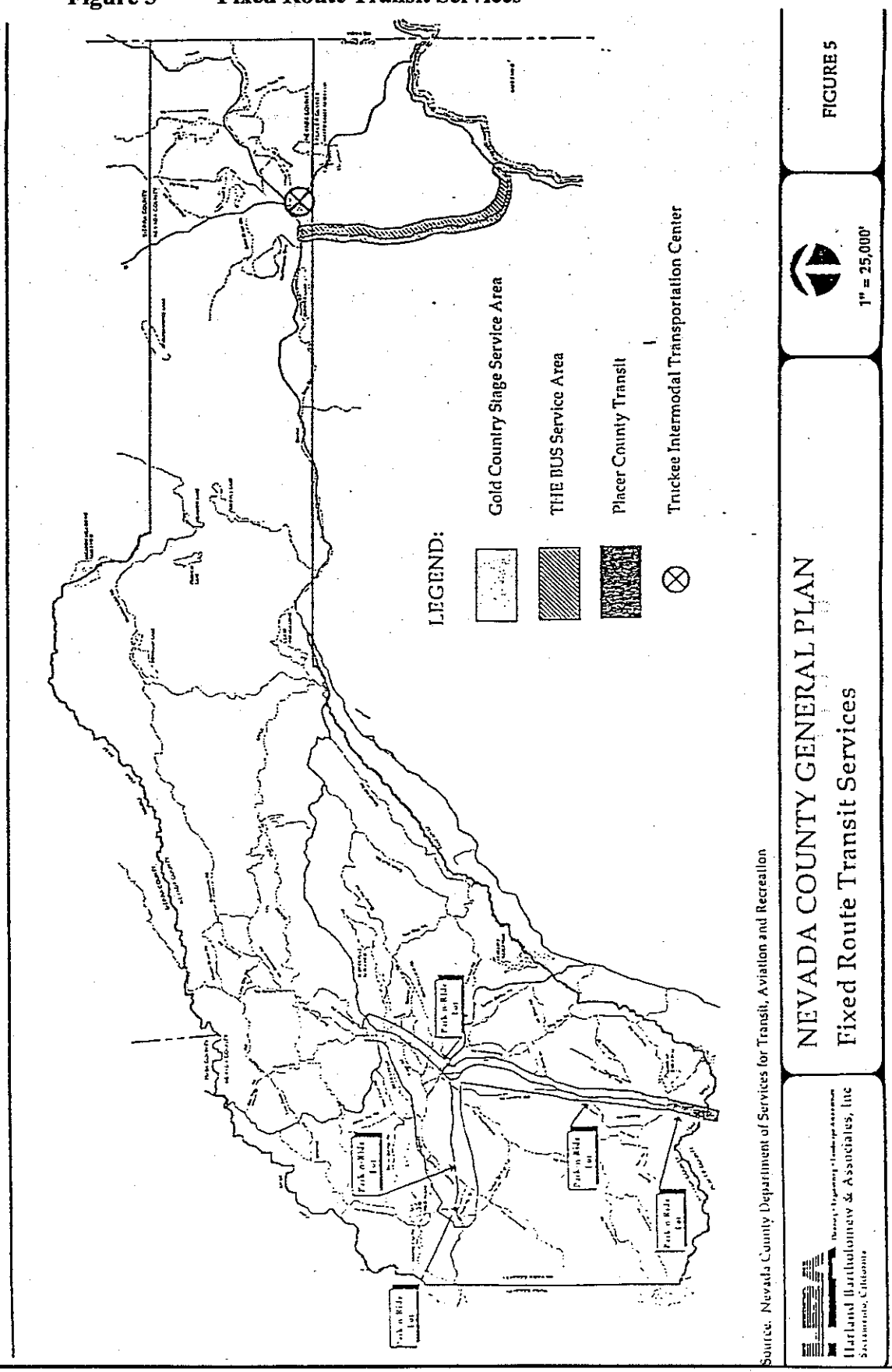
Non-Auto Facilities

Although bicycle, pedestrian, and equestrian trails have been planned for in Nevada County, the number of existing trails is limited. Figure 6 displays the non-auto trails within Nevada County which are either complete or partially complete. A brief description of each is given below.

- ***Scotts Flat Trail*** is a 50 mile trail that crosses both Forest Service and private property. It serves Upper Burlington Ridge, Deer Creek Forebay, Indian Springs and Towle Mill.
- ***Nugget Trail*** extends approximately 50 miles at the Sierra County Line. It also crosses both Forest Service and private property.
- ***South Yuba Trail*** begins at the South Yuba Recreation Area and extends approximately 5 miles to campgrounds.
- ***Missouri Bar Trail*** extends north of Highway 20 across the South Yuba River.
- ***Pioneer Trail*** parallels Highway 20 east of Nevada City. Approximately 15 miles are complete, with plans for an extension to the Pacific Crest Trail by 1993.
- ***Emigrant Trail*** is a historic trail of regional significance extending through the entire County.
- ***Wildwood*** is a proposed equestrian center and trail system of approximately 20 miles near Lake Wildwood.
- ***Empire Mine State Park*** is a trail of approximately 10 miles near Highway 49 in Grass Valley.
- ***Independence Trail*** is a 2 mile trail adjacent to Highway 49 north of Nevada City for handicapped persons and wheelchairs only.
- ***Pacific Crest Trail*** is a north-south trail extending from Canada to Mexico through the eastern portion of the County.
- ***Mount Olive Bike Path*** is a Class I path adjacent to Mount Olive School near Lower Colfax Road.
- ***Magnolia School Trail*** is a short path that serves school students along Magnolia Road.

These trails are oriented toward recreational use and provide County-wide linkages between different portions of Nevada County.

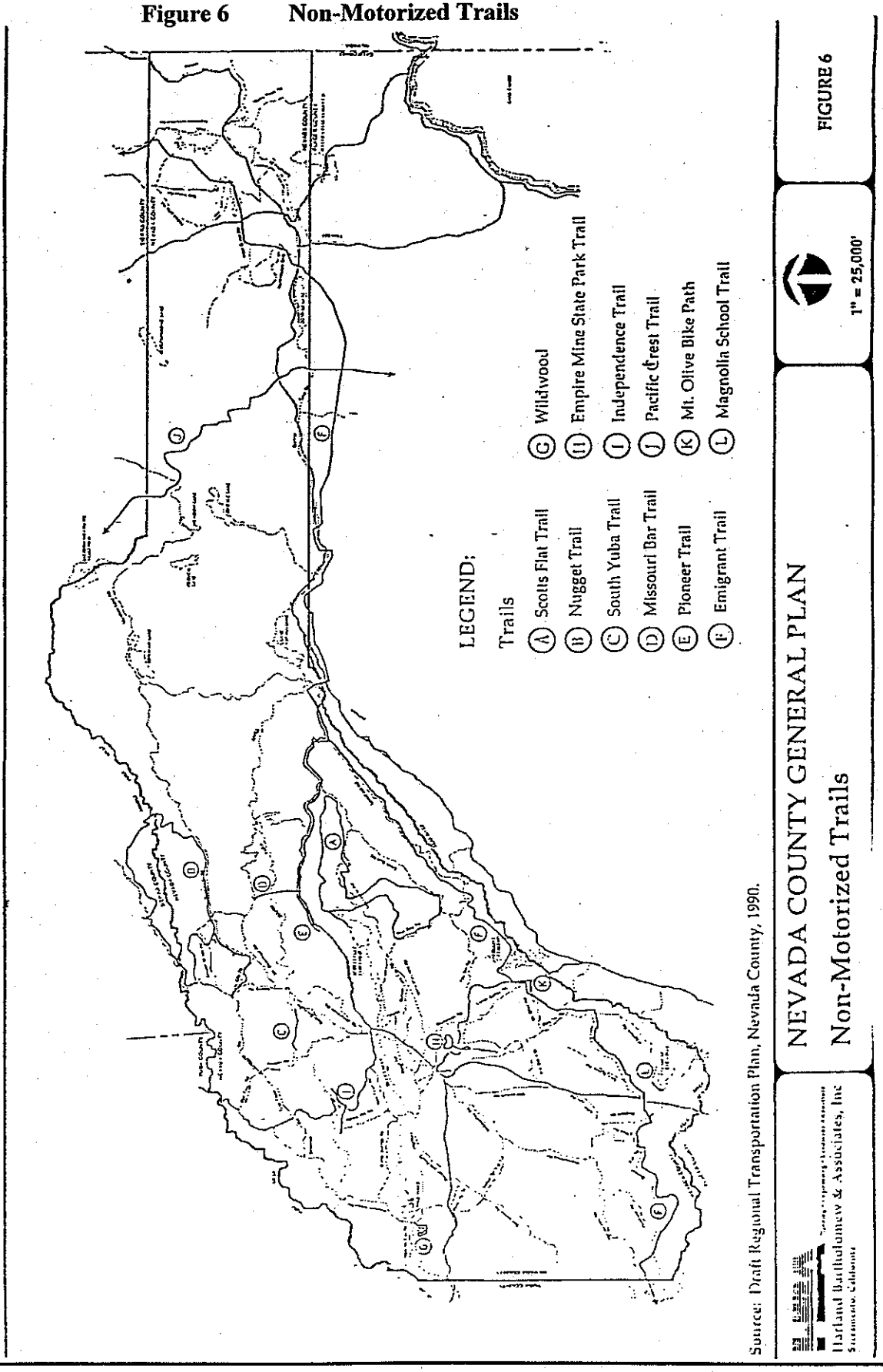
Figure 5 Fixed Route Transit Services



The 1989 Nevada County Master Bicycle Plan displayed on Figure 7 includes bike lanes within the urbanized areas of the County that improve non-auto access and mobility. The network identified in the Master Plan provides a contiguous system for bicycle travel in most areas of the County expected to have significant population growth. Implementation of the Master Bicycle Plan would increase the quantity of non-auto trails in Nevada County, which serve as important recreational resources. However, due to the County's topography and long travel distances related to rural development patterns, non-auto trails cannot be expected to significantly reduce automobile dependency or use.

One focus of the General Plan update is to develop land use patterns which are better suited to accommodate bicycle travel as an alternative to the automobile. With higher density land uses where trip productions and attractions are closer together, non-auto facilities would be an integral part of the transportation system.

Figure 6 Non-Motorized Trails



TSM/TDM Measures

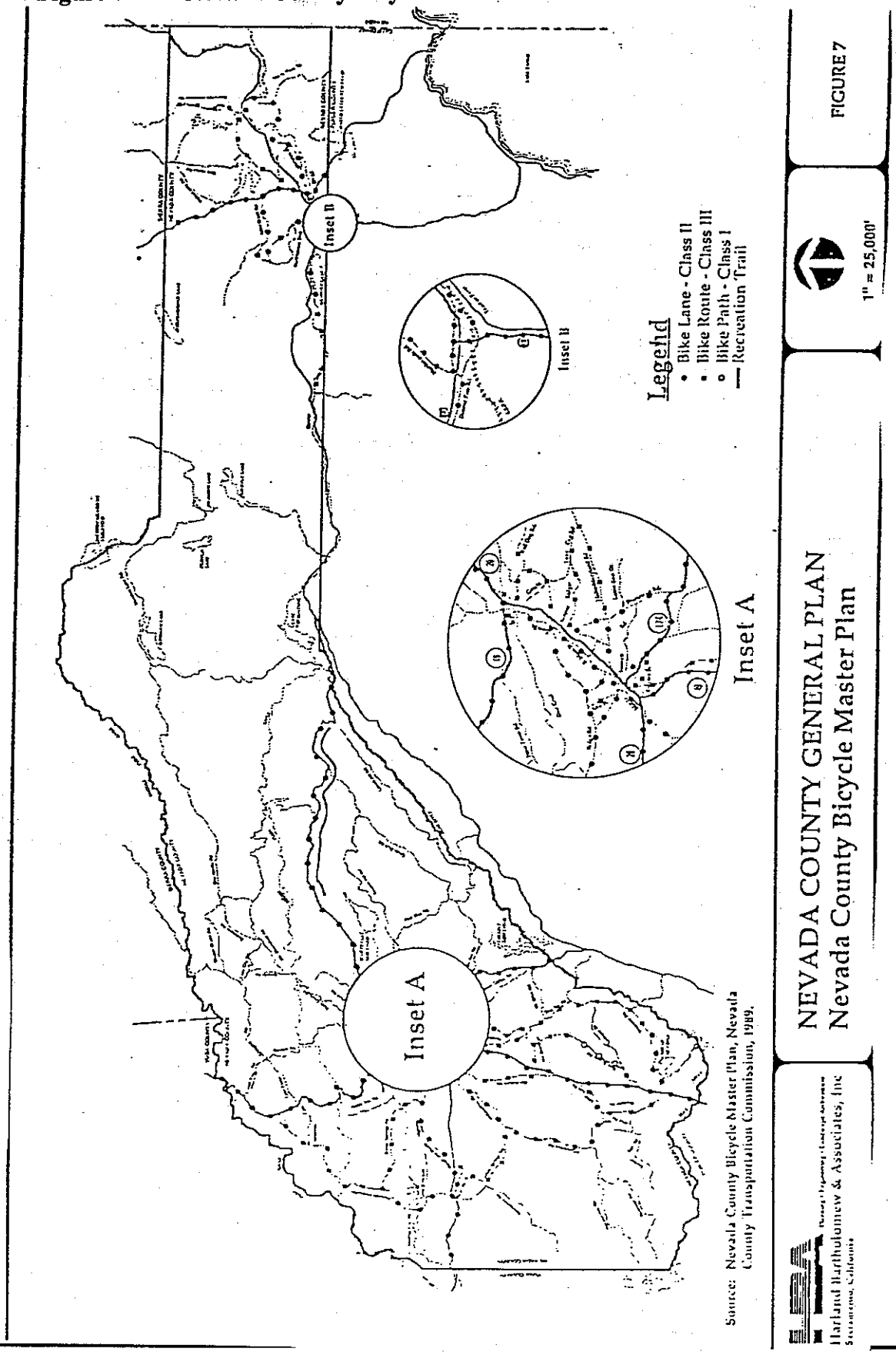
Transportation systems management (TSM) and transportation demand management (TDM) are two strategies that increase the efficiency of the existing transportation system. TSM actions maximize transportation system operating efficiency through low cost, physical improvements. TDM actions maximize transportation system utilization through modification of travel behavior decisions. Specifically, TDM actions attempt to modify travel choices and alter relative transportation prices for different travel decisions. Given the increased demand on public resources and concerns for the environment, Nevada County can expect demand to increase for the expansion and improvement of existing transportation facilities and programs in lieu of new, capital intensive improvements. The use of TSM/TDM actions will play an important role in meeting this new demand.

Nevada County does not currently have a TSM program in place. However, there are opportunities for the County to implementing TSM actions, including corridor management along the State Route 49 and 267 Corridors and the implementation of appropriate TSM measures to improve the operating efficiency along each corridor. Typical TSM measures include the following:

- Freeway High Occupancy Vehicle Lanes
- Arterial/Downtown High Occupancy Vehicle Lanes
- Signal System Improvements
- Roadway Improvements
- Freeway Control/Ramp Metering
- Parking Supply Limits
- Suburban Park-and-Ride Lots
- Fringe Area Park-and-Ride Lots
- Exclusive Transit Lanes
- Light Rail
- Bus Service Expansion
- Land Development Policies favoring Vehicle Trip Reduction
- Policies promoting On-Site Transit Access for New and Existing Development

Travel behavior of Nevada County residents is similar to most areas of California where the automobile is the preferred mode choice. As the population of Nevada County increases, TDM actions will become increasingly important to ensure efficient utilization of the transportation system. A TDM action currently being implemented in Nevada County is ridesharing; which includes carpooling and vanpooling. But, Caltrans data indicates approximately only 30 people currently carpool in Nevada County. This figure is very low, even recognizing the likelihood of rideshare participation not registered with Caltrans. There are five Caltrans park-and-ride lots located in Nevada County. According to 1991 data, available parking spaces at these facilities were only 39 percent utilized, while the bike lockers were not used at all. Significant reserve capacity exists to accommodate increased park-and-ride participation.

Figure 7 Nevada County Bicycle Master Plan



In the future, it is anticipated that TSM and TDM measures will play an important role in the operation and management of the transportation system in Nevada County. Given the cost of implementation and the limited financial resources available to the County, TSM and TDM measures are among the most realistically effective methods to relieve congestion and improve air quality. Strategies that are currently being considered for inclusion in the County's Air Quality Attainment Plan and which could be included within a TSM/TDM plan for the County include:

- ***Commuter Bus Service.*** This service would be an express bus traveling between Grass Valley/Nevada City and Sacramento. Stops should be limited to major areas of trip productions and attractions.
- ***Enhanced Carpool Matching Program.*** This program would provide ride-matching information for carpool and vanpool riders and providers.
- ***Satellite Offices/Telecommuting.*** This program is aimed at keeping commuters at home or in local offices. A feasibility study should be prepared before implementation of this program.
- ***Transit Marketing Plan.*** Increase public awareness regarding transit opportunities and the benefits of transit use on air quality;
- ***Alternative Modes of Travel.*** Telecommuting, carpooling and vanpooling, transit, bicycling and walking;
- ***Alternative Hours of Travel.*** Staggered shifts, Flexible Hours, Compressed Weeks, and HOV Preferential Scheduling;
- ***Parking Pricing.*** Parking Fees, HOV Preferential Spaces, and HOV Preferential Fees;
- ***Enhanced Local Transit.*** Improved transit service within Grass Valley/Nevada City; and
- ***Employer Based Carpool Programs.*** Increase employee vehicle occupancy through incentives or requirements.

Responsibility for implementing these TSM and TDM measures lies within the discretion of the local jurisdictions in the county which have land development permit authority. Nevada County, Grass Valley, Nevada City and Truckee have land development authority in their jurisdictional boundaries. As this study is confined to the limits of Nevada County's jurisdiction, no direction can be forced upon any incorporated cities in the County. But, the County can encourage participation in a comprehensive TSM/TDM program.

Such a program may include the TSM measures introduced earlier. In addition, further study and recommendations regarding the scope of a comprehensive TSM/TDM program would be required. This is due to the strong leverage the three cities potentially hold regarding TSM and TDM programs since a high percentage of county-wide traffic is generated within the three incorporated cities. If federal and/or state air quality regulations become an important issue in Nevada County, the entire region will be forced to address the air pollution issue. With limited point and area emission sources, major emphasis will be placed on transportation emissions.

Air Transportation

There are two general aviation airports in Nevada County. The Nevada County Air Park, located east of Grass Valley, serves the Western County while the Truckee-Tahoe Airport serves the Eastern County. The location of each airport is displayed on Figure 8.

The ***Nevada County Air Park*** is a small aircraft airport classified in the Airport Reference Code as B-1, meaning it generally accommodates aircraft $\leq$ 12,500 pounds and < 49 foot wingspan. The 1990 Nevada County Air Park Master Plan recommended expansion of the Air Park which included physical improvements to meet future demand and to correct a line-of-sight distance requirement for aircraft.

The ***Truckee-Tahoe Airport*** is a Basic Utility-Stage II Airport which handles predominantly small aircraft but has the capability to handle larger aircraft due to runway size. This airport is owned and operated by a special airport district which includes portions of Eastern Nevada and Placer Counties.

The number of aircraft operations and based aircraft at the Air Park and the Truckee-Tahoe Airport are projected to increase over the next 20 years. The Air Park Master Plan analyzed three forms of airport capacity, which included airfield, building area, and environmental. The results of the capacity analyses showed that none of the three forms of airport capacity will be exceed by 2010. However, the Air Park will require significant improvements in the short- and long-term to operate safely and efficiently.

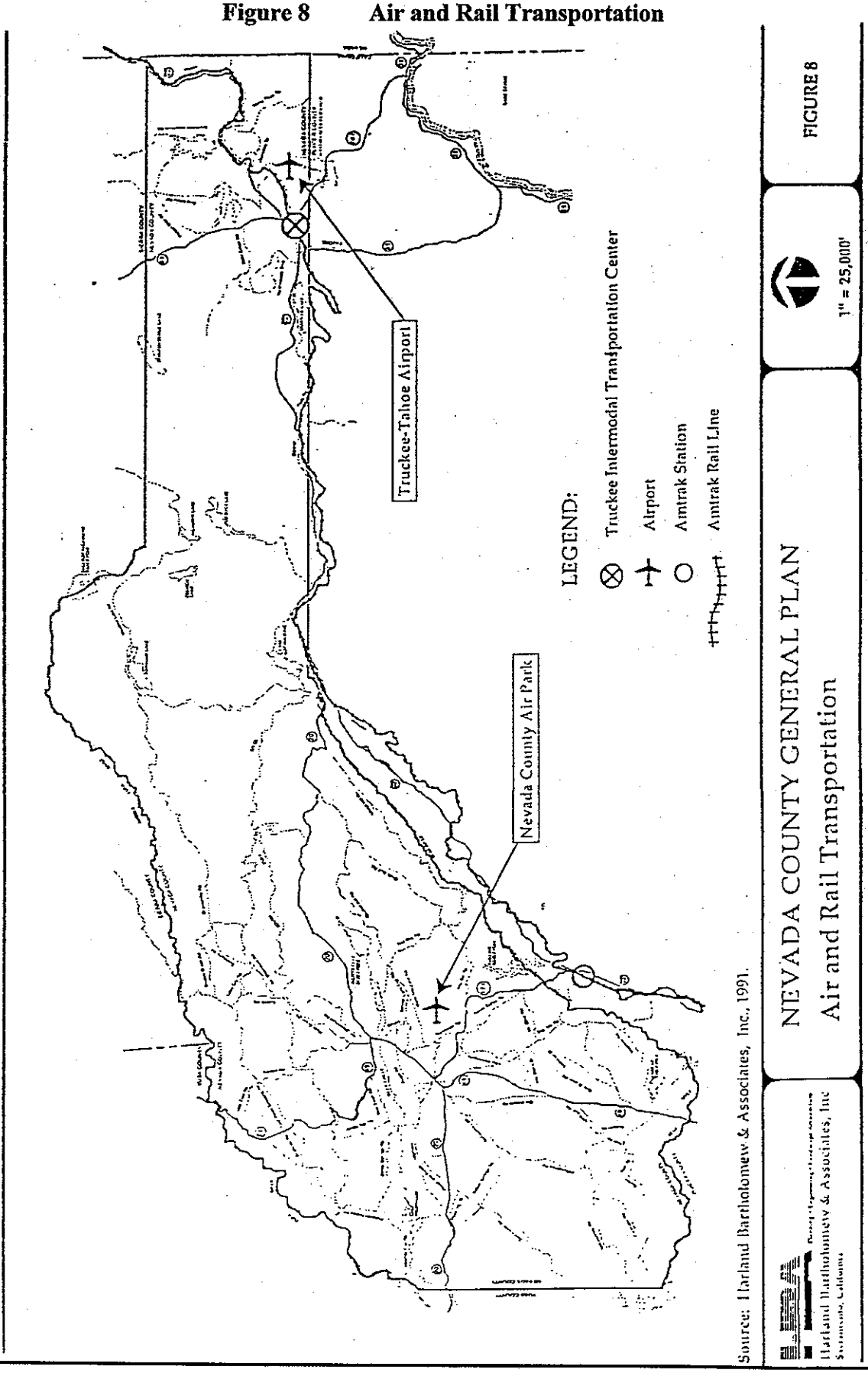
The Truckee-Tahoe Airport Master Plan was most recently updated in 1988. Total aircraft operations are expected to increase significantly over the next 20 years, which will exceed the current capacity of the airport. Short-term and long-term improvements will also be required at this airport to accommodate future demand.

Rail Transportation

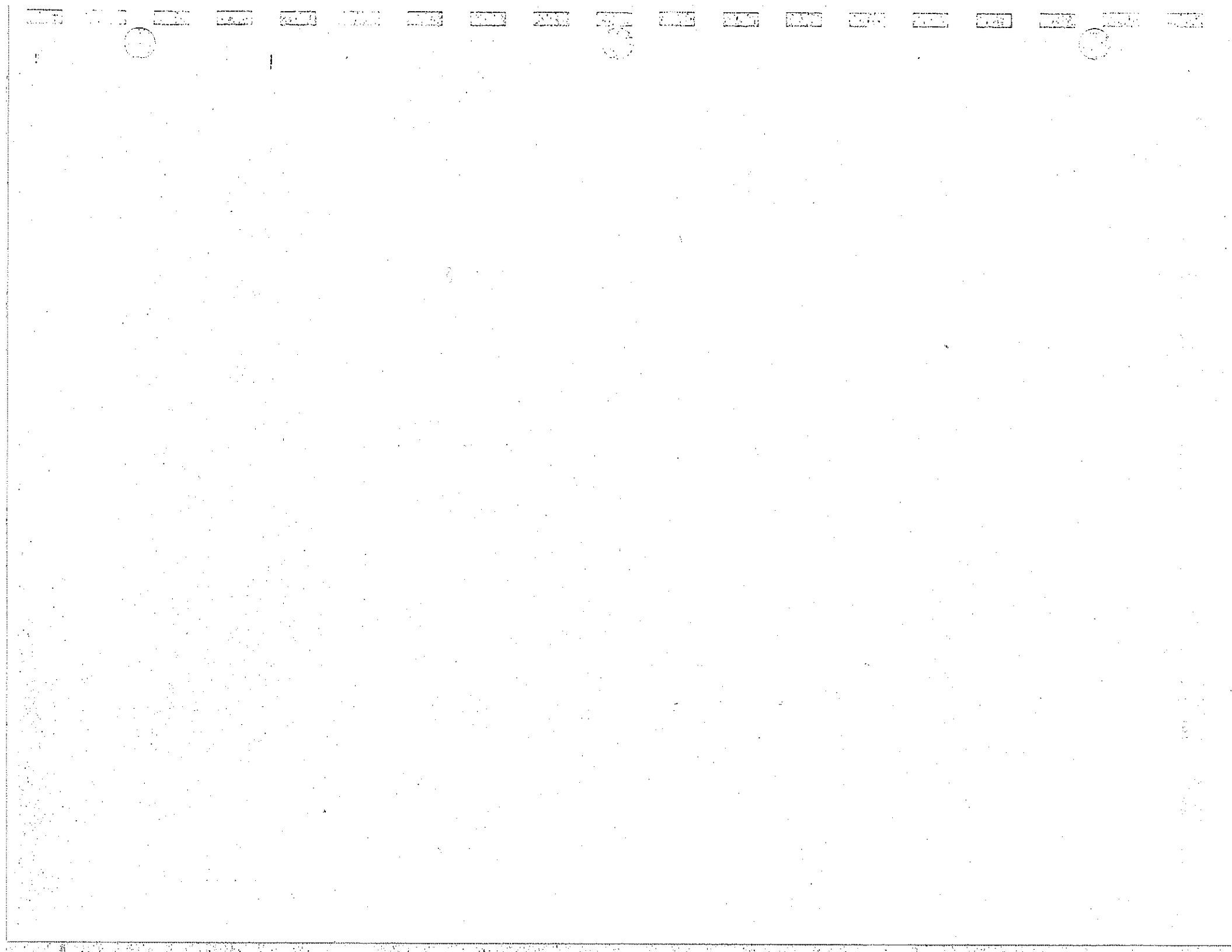
Southern Pacific (SP) railroad owns and operates one set of tracks that follows Interstate 80 along the southern border of Nevada County as shown in Figure 8. The rail line is used for the shipment of goods and people. Currently, Amtrak's California Zephyr serves the San Francisco to Chicago corridor with a mid-day train in each direction through nearby stations at Sacramento, Roseville, Colfax, Truckee, and Reno. Also, the mid-day train supplies an alternative mode of travel to the automobile or airplane in the Reno to San Francisco corridor. The Truckee Intermodal Transportation Center is an important facility located in the eastern County which serves transit, rail, automobiles, trucks, bikes, and pedestrians.

Due to a lack of available data, performance of existing rail facilities in Nevada County could not be analyzed. It is clear, however, that Nevada County's rail system does not accommodate a significant share of the existing daily demand for the movement of people.

Figure 8 Air and Rail Transportation



The Nevada County Transportation Commission conducted the *Nevada County Rail Feasibility Study* to determine the potential corridors, markets, costs and types of service for rail transit in Nevada County. Long-term needs have been identified in the Nevada County Rail Feasibility Study based on excessive automobile demand on local and state roadways as well as achieving local goals to reduce environmental impacts of the County's transportation system. The most viable option for rail transit service in Nevada County is the use of feeder bus service connecting Nevada County population centers with planned state-supported intercity passenger rail services in the Auburn-Sacramento-Oakland-San Jose corridor.



Chapter 3 Infrastructure

Introduction

A variety of infrastructure improvements are needed to address the requirements of population and employment growth. This analysis identifies the future needs, and the criteria on which the needs are based, for major types of infrastructure which will be needed to support the population and employment levels associated with buildout of the General Plan. The analysis of future need is based upon the population and employment data presented in Chapter 1, and the levels of service on which the projected needs and requirements are based are identified in the following sections, consistent with the policies in Volume 1 which establish level of service standards.

Projected Water Requirements

Projection of future water requirements and demand involves analysis of several key elements including the following:

- projection of future land use, development trends and population densities;
- estimation of water usage utilizing representative flow factors;
- determination of required fire flows; and
- estimation of water demand for urban and rural areas using the flow factors and fire flows with respect to projected service population.

Population projections based on land use and development trends have been discussed in previous sections. The information from this projection analysis is used in the determination of the water demand.

The management of water resources in western Nevada County is a multidisciplinary challenge. Western Nevada County does not have

Western Nevada County has conditions and problems similar to many other rural counties in the Sierras and the foothills. These semi-rural counties, from which runoff from the mountains supply a significant portion of California's water resources, need to protect their future by preserving "counties-of-origin" rights. Western Nevada County, represented by the NID, has joined other districts in the counties from Mariposa to Plumas to form the Mountain Counties Water Resources Association. They are striving to present the case for protecting existing waters and prepare for future needs of the region.

Existing Systems

Western Nevada County is served by several public water purveyors including the Nevada Irrigation District, Nevada City, Grass Valley, Washington County Water District, Deer Creek Park Mutual Water Company and the San Juan Ridge County Water District.

Nevada Irrigation District

The primary purveyor of treated domestic water and agricultural water in western Nevada County is the Nevada Irrigation District (NID). The district provides treated water for domestic, commercial and industrial purposes as well as untreated water for irrigation. The District encompasses an area of approximately 286,800 acres in Nevada, Placer, and Yuba Counties. The area actually served by treated water systems or ditches is much smaller. (See Figure 3) There are some areas, principally mining zones, within the NID boundary which were not included in the District. The area within Nevada County covers approximately 200,000 acres or about 70 percent of the total area of the District. Water is delivered through approximately 430 miles of ditches and other water conveyance structures. A number of artificial reservoirs have been constructed on the area's tributaries which provide water storage within the district's boundaries. Storage reservoirs in the mountainous areas in the north central portion of the County are also used to store waters in the higher elevations of the Sierras. Total storage of the ten NID reservoirs is approximately 250,280 acre-feet.

The District diverts waters from the Middle Fork of the Yuba River and Canyon Creek watersheds into the South Yuba watershed at the Spaulding Powerhouse No. 3 penstock located at Lake Spaulding. This lake is owned by the Pacific Gas and Electric Company. The water is released from Lake Spaulding for power generation and returned to the district through both the Drum Canal and the South Yuba Canal for use within the district's boundaries. Scotts Flat Reservoir is one of the reservoirs in the system used to store water for distribution in western Nevada County.

Currently, NID serves approximately 14,400 residential and commercial customers with treated water amounting to 7,000 acre feet. The number of customers currently is increasing at the rate of approximately 2 percent per year. The NID provides water to most of the urban and suburban centers.

- ***Nevada City*** purchases raw water from NID mainly during periods of peak demand. The city owns water rights from Little Deer Creek which is its primary water source. Nevada City has its own treatment plant which provides water to 1,177 metered customer as of June 1990 with a total annual production of 162.4 million gallons. Treatment processes are flocculation, sedimentation, chlorination and pH control. Storage facilities exist for 600,000 gallons.

- ***Grass Valley*** purchases raw water from NID on a year round basis. Water production for 1990/91 supplied 104 million gallons to 2,105 metered connections. The Grass Valley treatment plant incorporates flocculation, sedimentation, chlorination and pH control.

- ***Cascade Shores*** receives raw water from NID via the Cascade canal to Deer Creek. Water Treatment is provided at NID's Cascade Shores Treatment Plant utilizing pressure sand filters and chlorination. Current capacity is 0.34 mgd. Water production for 1990/91 provided 24.9 million gallons of water to approximately 350 customers.

- ***Elizabeth George*** treatment plant has a capacity of 10.0 mgd and supplies approximately 3,300 customers with 872.3 million gallons of water per year. NID owns and operates this Plant.

- ***Sherwood Forest*** has a capacity of 0.17 mgd and is supplied treated water from NID to serve 50 customers disinfected water. Sherwood Forest is in the process of constructing a tie-in to the Elizabeth George system.

- ***Lake of the Pines*** receives raw water from NID's Combie Reservoir via the Magnolia #3 ditch. Treatment plant capacity is 3.0 mgd. Currently, the system supplies 1,850 customers with an annual average of 317.8 million gallons. Treatment processes include pre-chlorination, upflow clarifier, pressure sand filtration with backwash equipment, post-chlorination and clearwell storage.

- ***Lake Wildwood*** is supplied water from NID via Newtown Ditch from Deer Creek above Nevada City's wastewater treatment plant discharge. The current treatment plant capacity is 4 mgd and supplies an annual average of 304.5 million gallons to 2,420 customers. Treatment processes include clarification, filtration, pre- and post-chlorination, pH control, and laboratory facilities.

- ***Penn Valley*** water system is part is Part of the NID and contains three public service wells and treatment facilities with a capacity of 0.5 mgd. 176 customers are supplied 37.1 million gallons annually. Penn Valley Water Treatment Plant is to be abandoned and treated water will be supplied by the Lake Wildwood System.

- ***Snow Mountain*** facilities include a 1.2 mgd water treatment plant and a400,000 gallon storage tank. Approximately 300 customers are served 66.7 million gallons annually. Treatment processes include flocculation, sedimentation, chlorination and pH control.

- ***Loma Rica*** system, receives its supply of raw water from NID via the Cascade Canal. The treatment plant incorporates flocculation, sedimentation, chlorination and pH control as treatment processes. Current plant capacity is 8.0 mgd and serves 3,730 customers 761.8 million gallons annually.

- ***Green Reservoir Treatment Plant*** received 0.1 mgd raw water from NID and served 58 customers an annual average of 17.0 million gallons of water. This facility no longer exists. Water is supplied by the Loma Rica system.

NID also provides water on a much smaller basis to Deer Creek Park Mutual Water Company to augment their water supplies obtained through wells. In 1991, NID delivered a total approximating 133,000 acre feet of water. Approximately 5 percent was treated domestic water and 95 percent was for agricultural purposes. The NID's major water source is from approximately 70 square miles of the upper reaches of the middle and south forks of the Yuba River and the Bear River. With a conservative "safe yield" from their sources of 220,000 acre-feet annually, NID has the potential to deliver over 80,000 acre-feet annually above the 138,000 acre-feet produced in 1990 (which was the highest recorded in recent years). This additional capacity could serve as many as 160,000 additional customers based upon an average annual demand of 0.5 acre-feet per treated-water customer. NID projects a total annual demand for treated-waters in 2010 of 15,800 acre-feet to serve 32,830 customers.

Within the NID jurisdiction there are approximately 1,300 connections which receive raw water on a year round basis. The majority of these "grandfathered" connections may be using at least a portion of this water for domestic purposes as reported in the 1983 NID Raw Water System Master Plan. The State and the County Environmental Health will not allow any new raw water connections for new construction.

There are approximately 20 small urban areas outside of the master planned service areas that are undergoing development for which inclusion of a treated water system is being considered. The California Department of Health Services has required that many raw water connections be upgraded to treated water. NID has found that in most cases it is more economical to supply water to these areas by providing a water line rather than developing a relatively more expensive small satellite treatment plant for each future district. Attempts are underway to obtain Clean Water loans or grants to help finance these Improvement districts.

In their 1990 Update of the Urban Water Management Plan, NID projects that by the year 2010, their total number of customers will increase by 128 percent, to 32,930, with a demand of 15,800 acre feet annually of treated water. Water production for the whole district in recent years has ranged from a high of 133,000 acre-feet in 1991 to a low of 57,408 acre-feet in the drought year of 1977. NID estimates that approximately 95 percent of water sales is for raw water for agricultural use, and that by the year 2010, that will drop to 90 percent as urbanization spreads. Thus, there does not appear to be a significant constraint upon increased domestic/ commercial waters. On the other hand, additional agricultural water will probably be limited. NID expects to be delivering an annual average of raw and treated water of 140,000 acre-feet in the 1990's as compared with about 109,000 acre-feet through the 1970's. With reservoir storage capacities of approximately 250,000 acre-feet and a conservative "safe yield" of 220,000 acre-feet, there is approximately 80,000 acre-feet of capacity remaining. (In addition, there are some additional diversions downstream from the reservoirs that have not been included in these figures.) The NID has and will continue to negotiate with PG&E to purchase additional water supplies up to 20,000 acre feet.

Other Water Purveyors

The other water purveyors in western Nevada County with their own sources of water are Nevada City, Washington County Water District, Deer Creek Park Mutual Water Company and San Juan Ridge Water District. The City of Grass Valley which provides treated water to its customers, obtains raw water from NID. Nevada City and the City of Grass Valley, as well as Deer Creek Park, have adequate water supplies to deliver to their customers or are able to augment their system with water purchased from NID. Washington County Water District and San Juan Ridge Waler Company have their own sources of water which appear adequate for the limited development that is expected in their respective areas.

- *Washington County Water District* serves the small community of Washington, approximately 125 connections, from its own water source. Approximately 1.0 million gallons of filtered, chlorinated water is produced and distributed per year. The water comes from Little Canyon Creek.

- *San Juan Ridge County Water District* serves 20 to 22 irrigation customers with untreated waters from Shady Creek and area wells. Approximately, 19.5 million gallons are delivered per year.

Water Rights

Water rights in California are primarily limited to surface waters, while groundwater, except under very specific conditions, is not controlled by permit or water rights. Water rights in western Nevada County are either "riparian rights" or "appropriative rights" and are primarily held by NID.

"Riparian rights" are considered to be a part of the land and are passed with the title to the land. They were acquired because the property physically touched a watercourse. Riparian rights are not lost through non-use but must meet the constitutional condition of "reasonable and beneficial" use of the water. They are normally older and superior to appropriative rights. Because of the strict definition of riparian rights, as land with riparian rights is sold and subdivided, those rights will decrease as appropriative rights increase.

Appropriative rights in California grew out of the practice, during the early mining days, of "first in time, first in right" based on physical control and beneficial use, without special relationship to land as in riparian rights. The owner of appropriative rights may sell or transfer those rights. Prior to 1914, appropriative rights were acquired by putting the water to a beneficial use and "posting notice" at the point of diversion. After 1414, the State required application for a permit to appropriate water. A permit is issued when a water user files an application for diversion of water. When the permittee develops the full beneficial use of the water, they file for a license which verifies the term of the appropriated rights.

In order to protect their water rights, NID has an ongoing program to update permits and obtain licenses for all diversions. Diversions are for consumptive uses and power generation. NID has riparian and pre-1914 water rights as well as applications that were filed post-1914. They currently hold twenty-nine licenses and have ten more applications on record. They expect to complete licensing of outstanding applications within the next two to three years. NID feels that these water

rights will provide adequate water for development through the year 2010. Determinations on the costs and benefits of developing potential water rights have been made. In the opinion of the NID staff, applications have been filed for a majority of the water rights within Nevada County that can be economically developed. For example NID determined that the cost to enlarge Rollins Dam to increase the yield by 5,000 a(re-feet was not cost effective. Also, additional water rights at Camp Far West would not benefit Nevada County because they would have to be diverted at an elevation too low to be economical to pump.

The California Constitution requires that the principle of "reasonable and beneficial" be applied to the use of water and issuance of water rights. The term "reasonable and beneficial" is not fully defined and is evolving as a concept. It does require that water be used for the most beneficial purposes and that unreasonable or wasteful uses are to be eliminated. The SWRCB may review all permits and licenses if conditions concerning the public trust change sufficiently.

Water Usage

Future water use requirement estimations are made using representative flow factors which correspond to categories of land use. The Nevada Irrigation District (NID), in the western portion of Nevada County, published criteria for maximum daily water use in the 1978 Water Distribution System Master Plan Assumptions. These criteria have since been used by the individual service areas within the NID boundaries. Comparison of these assumptions to actual average water use in these areas indicate that the NID criteria are appropriate for planning purposes. Table 13 presents the NID criteria, utilized for estimating maximum daily water use in gallons per minute (gpm) and gallons per day (gpd).

Table 13

Design Water Use Criteria

Type of Water User	Maximum Daily Water Use (gpm)	(gpd)
Domestic (per Dwelling Unit)	1.0	1,440
Commercial (per Acre)	2.1	3,024
Light Industrial (per Acre)	2.1	3,024
Institutional (per Acre)	3.5	5,040
Parks (per Acre)	1.4	2,016

Comparing the information received from NID on water production in Nevada County by individual treatment works with the number of connections or equivalent dwelling units (EDUs) associated with the area served yields the average daily flow per connection as shown in Table 15.

Peaking ratios are used to compare average daily flow with maximum daily flow. The following peaking ratios are used by NID and correspond to standard design ratios as shown in "Water Treatment Principles and Design" by James M. Montgomery, Consulting Engineers, Inc.

- Maximum Day Demand/Average Day Demand 2.5
- Peak Hour Demand/Maximum Day Demand 2.0
- Peak Hour Demand/Average Day Demand 5.0

Multiplying the average daily flows per connection in Table 13 by the peaking ratio for maximum day to average day shown above results in an estimate of maximum daily flow shown in Table 9. In most cases, this value is similar to the design maximum daily water demand values used by NID presented in Table 14.

The average and maximum daily flows can be further broken down into per capita flows. Throughout the County the density used in past studies has ranged from 2.0 to 2.6 persons per EDU. In earlier sections a density unit of 2.3 persons per EDU was used for population projections. This is slightly less than the 2.5 persons per EDU used by NID.

Table 14

Average Daily Flows

Location	Water Production per Year (MG)	Existing Connections or EDUs	Average Daily Flow per EDU (gpd)	Maximum Daily Flow per EDU (gpd)
WESTERN NEVADA COUNTY				
NID:				
Cascade Shores	24.9	350	195	487.5
Elizabeth George	872.3	3,300	724	1,810
Lake Wildwood	304.5	2,420	345	862.5
Penn Valley	37.1	176	578	1,448
Lake of the Pines	317.8	1,850	471	1,177.5
Snow Mountain	66.7	300	609	1,522.5
Loma Rica	761.8	3,730	560	1,400
Green Reservoir	17.0	58	803	2,007.5
Other:				
Nevada City	162.4	1,177	378	945
Grass Valley	104.0	2,105	135	337.5
Washington County W.D.	1.0	125	22	55
San Juan Ridge (irrigation only)	19.6	5	1,074	2,685
EASTERN NEVADA COUNTY:				
Truckee-Donner PUD	1,100.0	6,027	500	1,250
Donner Summit PUD	0.1234	500		
Glenshire Mutual WC	117.5	968	333	832.5

To determine per capita flows for projection purposes the NID maximum daily flow of 1,440 gpd/EDU divided by the NID density factor of 2.5 yields 576 gpcd maximum daily flow. Dividing this value by the peaking factor of 2.5 yields an average daily flow of 230 gpcd. These per capita flows will be used in the following flow calculations for residential use.

Commercial and Industrial water usage are determined on a per employee basis. This is accomplished using acreage, square footage used, density of employees per 1,000 square feet and 3,000 gpd per acre. For example, to determine industrial per employee we must first find the number of persons per acre. Then, knowing that flow is 3,000 gpd per acre maximum or 1,200 gpd average, by dividing this flow by the number of employees per employee flow is determined. Numerically this is done by:

$$1 \text{ acre} \times 43{,}560 \text{ sf/acre} \times 15\% \text{ used/acre} \times \frac{1000 \text{ sf(emp)}}{600 \text{ sf}} = 10.88 \text{ emp/acre}$$

$$1{,}200 \text{ gpd}/10.88 \text{ EMP} = 110 \text{ gped.}$$

For commercial flows two flow factors are calculated due to the difference in square footage required by each employee for commercial type. These work out to be 22 gped for retail and 88 gped per office.

Fire Flows

Provision of water for fire fighting is another design concern. Fire flows can be supplied from stored treated water or directly from the treatment plant. The choice of using storage or sizing the treatment works to provide these flows is greatly influenced by cost. A storage facility is a lower cost item initially. However, sizing the treatment facility to provide fire flows can defer future upgrades to the plant. The distribution system must be sized to handle fire flows.

Suggested fire flow requirements from area fire departments are presented in the individual community Water Master Plans. Table 15 summarizes the suggested fire flows for different types of land use.

Table 15
Fire Flow Summary

Land Use	Fire Flow (gpm)	Duration (Hours)
Residential Low Density	500	2
Urban Single Family	500	2
Urban Medium Density	1,000	2
Urban High Density	1,000 - 2,000	2
Commercial	1,000 - 2,000	2 - 4
Industrial	1,500 - 3,500	2 - 4
School	2,000	4

Fire flow used for projection purposes is 2,000 gpm times 3 hour duration which equals 360,000 gpd.

Treated Water Storage

Within each of the individual water systems storage facilities exist for treated water. Table 16 is a listing of some of these existing storage facilities as described in Master Water Plans developed for service areas within NID and past General Plans.

Treated water storage for a domestic water supply is generally provided for three purposes: equalizing, fire reserve, and emergencies. NID suggested minimum requirements for equalizing storage at 25 percent of maximum day demand in their "Master Plan Assumptions". Twenty-five percent of maximum day demand has also been suggested as minimum amount of treated water necessary for emergency reserve. Table 12 presents storage needed now in each system calculated as total treated storage = fire flow + equalizing + emergency.

A need for treated storage to supply current fire flow requirements, equalizing, emergencies and to provide for future growth is recognized. From Table 17 it can be seen that Cascade Shores, Penn Valley, Green Reservoir, Washington County Water and San Juan Ridge have a current need for storage. Grass Valley also faces a current storage need. The community Master Water Plans have identified storage needs in the NID area of service. Lake Wildwood has proposed two new tanks to supply 1.14 million gallons of needed storage. Lake of the Pines realizes a need for a new 1.0 mg facility. Penn Valley has a current demand for at least 270,000 gallons of storage. To meet this need a 200,000 gallon tank is proposed to augment current water supplies. Snow Mountain has proposed increasing storage at the plant to 1.2 mg.

Table 16
Treated Water Storage Facilities

Location	Storage Capacity (MG)
Elizabeth George	
Banner Reservoir	10.000
Taylor Tank	0.500
Upper Banner Tank	0.300
Sherwood Forest Tank	0.100
Lake Wildwood	
6 Tanks	1.600
Penn Valley	0.150
Lake of the Pines	1.250
Loma Rica (untreated)	31.500
Loma Rica	
Treatment Plant	1.700
Osborne Hill	1.250
Alta Sierra Reservoir	2.870
Cherry Creek	0.080
Snow Mountain (untreated)	0.600
Snow Mountain	0.600
Nevada City	0.600
Washington County	0.080
Donner Summit PUD	
Lake Angela (untreated)	70.000
Donner Lake	0.457
Truckee-Donner PUD	
Gateway	0.420
Old Town	0.300
Tonini	0.033
Prosser Heights	0.969

Table 17

Current Treated Water Storage Requirements

Location	Max. Daily Flow (gpd)	Fire Flow (gpd)	Equalizing (gpd)	Emergency (gpd)	Total (gpd)	Existing (gallons)	Existing Storage Day Available
NID:							
Cascade Shores	487.5	360,000	121.9	121.9	360,243.8		0.00
Elizabeth George	1,810.0	360,000	452.5	452.5	360,905.0	10,900,000	30.20
Lake Wildwood	862.5	360,000	215.6	215.6	360,431.3	1,600,000	4.44
Penn Valley	1,448.0	360,000	362.0	362.0	360,724.0	150,000	0.42
Lake of the Pines	1,177.5	360,000	294.4	294.4	360,588.8	1,250,000	3.47
Snow Mountain	1,522.5	360,000	380.6	380.6	360,761.3	600,000	1.66
Loma Rica	1,400.0	360,000	350.0	350.0	360,700.0	5,900,000	16.36
Green Reservoir	2,007.5	360,000	501.9	501.9	361,003.8		0.00
Other:							
Nevada City	945.0	360,000	236.3	236.3	360,472.5	600,000	1.66
Grass Valley	337.5	360,000	84.4	84.4	360,168.8		0.00
~~Washington County W.D.~~	55.0	360,000	13.8	13.8	360,027.5	80,000	0.22
~~Sandban Ridge~~	2,685.0	360,000	671.3	671.3	361,342.5		0.00
Eastern Nevada County:							
Truckee-Donner PUD	1,250.0	360,000	312.5	312.5	360,625.0	1,722,000	4.78
Glenshire Mutual WC	832.5	360,000	208.1	208.1	360,416.3	457,000	1.27

Total Water Usage

In the population projection section the projected population for the major growth areas was calculated. Using these computed populations, the estimated water use associated with the different land uses, and fire flow requirements projected water demand can be estimated.

In all cases, the existing storage is such that approximately one or less than one day of treated storage is available at the future storage daily requirement. This indicates that either the treated water storage volume should be increased or the treatment plant must be enlarged to provide the projected storage flows. Both of these options have associated costs and benefits which will need to be examined in deciding how to go about providing the necessary flows.

The population projections indicate substantial growth in the Grass Valley area. This would include much of the Elizabeth George service area. Thus, the current design and storage capacities for Grass Valley include those present in the Elizabeth George service area.

Based upon projected levels of development, upgrades will be necessary in the future for several of the community areas.

- The Nevada City and Grass Valley areas are bordered by the Elizabeth George service area. The Elizabeth George capacities have been entirely included in the Grass Valley totals for simplicity. There is probably some overlap with the Nevada City projected growth and development such that some of the deficit is probably borne by the surplus shown at Grass Valley. However, Nevada City is presently at approximately full design capacity and will need to upgrade for any future growth.

- Penn Valley is presently at approximately 51% capacity and will need to upgrade to at least 2.4 mgd by build out with storage facilities added.
- Lake of the Pines is also expected to have significant growth and will find upgrade to 6.0 mgd necessary in the future. Additional storage facilities are needed or the plant itself needs to increase to 8 mgd.
- In the Rural Regions, some of the Rural Places are in areas that NID has indicated would be relatively easy and economical to provide with water. These are Cascade Shores, Cedar Ridge, and Chicago Park. The Rough and Ready, Red Dog-You Bet, North San Juan, and Washington areas are supplied by their own systems and will probably not experience the growth expected in other areas.
- The Rural Areas are for the most part areas that NID has indicated could be served without creating new pump zones but would be difficult and costly to provide future system upgrades. Some of the rural area outside the NID district boundaries would be very difficult to connect to any community type treated water system.
- Eastern Nevada County, as shown in the population projections segment is also expected to experience growth. Current treatment facilities will face substantial enlargement and storage needs will require either several new storage facilities or further enlargement of the treatment works.

Projected Wastewater Requirements

Projection of future wastewater facility requirements and flow generation involves analysis of several key elements including:

- Projection of future land use, development trends and population densities;
- Estimation of wastewater representative flow factors; and
- Determination of area flows using the flow factors and projected service populations.

Population projections based on land use and development trends have been discussed in previous sections. The information from the projection analysis is used in the determination of the remaining elements.

Wastewater Flows

Future wastewater requirement estimations are made using representative flow factors which correspond to categories of land use. In general, wastewater flows tend to be approximately 2/3 of the water flows. Water flows used for design purposes in Nevada County are approximately 230 gallons per day per capita (gpcd) residential and flows ranging from 22 to 110 gallons per day per employee (gpcd) for commercial and industrial water use. This relates to a residential wastewater flow of 150 gpcd. Commercial and industrial wastewater flows are estimated at 25 gped.

Table 18 presents existing wastewater flows for community regions, rural places and rural areas in western Nevada County and districts in eastern Nevada County. Average flow per connection includes residential, commercial and industrial flow components. To enable comparison, the flow factors above are combined to approximate an average flow per EDU of 200 gpcd.

From the table it can be seen that the average daily flows vary widely. It also appears that the residential flow factor of 200 gpcd is a midpoint in the range of average flows seen. The larger urban areas have correspondingly greater average daily flows. This may be as a result of ready access to water supplied through distribution systems and older sanitary sewer pipe networks which allow inflow and infiltration during storm events. Facilities which rely on individual well water supplies tend to be a little more conservative in their in home water use, thus generating less wastewater to a sanitary system. Some of the smaller sanitary systems rely on community septic systems, STEP systems or small package plants which can also be a limiting factor on water usage and, thus, wastewater generation. Note that the flows at Donner Summit seem very high. This may be a result of the varying populations during tourist season as opposed to the off-season. Also, the average wastewater flow for Grass Valley is greater than the average water flow as shown in the section on water use. This is a result of the incorporation of portions of the Elizabeth George water service area into the wastewater service area of Grass Valley. The average water use of combined Elizabeth George and Grass Valley is 495 gpd per connection, while the combined wastewater generation is 281 gpd.

Table 18
Existing Wastewater Flows

Location	Existing Avg. Daily Flow (gpd)	Connections or EDUs	Avg. Flow per Conn. (gpd)
COMMUNITY REGIONS			
Grass Valley	1,272,000	4,530	281
Nevada City	400,000	1,130	354
Alta Sierra			
Kingsbury Greens	3,500	45	78
Gold Creek Park	6,000	44	136
Lake Wildwood	450,000	2,472	182
Penn Valley	25,000	259	97
Lake of the Pines	400,000	1,987	201
RURAL REGIONS			
Cascade Shores	14,000	64	219
North San Juan	6,200	82	76
RURAL AREAS			
Mountain Lake	1,500	13	115
EASTERN COUNTY			
Truckee Sanitation	1,007,000	5,912	170
Donner Summit PUD	520,000	545	952

Design of the wastewater treatment process is normally based on an average daily flow. Hydraulic capacity is normally based on peak flows. The peaking factor for average daily flows can vary widely depending on the size of the system, the extent of inflow and infiltration, and is determined on an individual service area basis.

Projected Wastewater Flows

Using the population and land use projections, the representative wastewater flow factors and the peaking factor an estimate of future wastewater flows can be made. Much of Nevada County in the Rural Places and Areas categories are on individual systems. Each of the community Regions will experience a deficit of their collection and treatment capabilities.

- Grass Valley and Nevada City are currently near design capacity and need to begin planning to upgrade to meet immediate and future growth needs.
- Alta Sierra is already experiencing difficulties and should be in the process of planning additional a collection and treatment systems. The two small community systems, Gold Creek and Kingsbury Green are at capacity. The individual septic systems throughout the Alta Sierra area are a subject of concern and a community collection and treatment system may be a solution to these concerns.
- Lake Wildwood plant expansion would involve investigation of alternative discharge methodologies. Land disposal could provide only a minimal solution due to the limited land area owned by the sanitation district. If treated effluent or reclaimed water is investigated, significant process changes and additions must be considered.
- Lake of the Pines will also need to expand in the future. Availability of land adjacent to the existing plant would make land disposal of treated effluent a feasible future expansion effluent disposal alternative.
- Penn Valley could be expanded to 1.0 mgd but would need to acquire land adjacent to the plant.

Within the Rural Regions of Nevada County there are currently over 17,000 homes or businesses not connected to an area collection and treatment system. This number is expected to increase significantly by build out. With few exceptions these possible connections are outside of the boundaries of the above wastewater service areas. For the most part they are either on large lots in a small subdivision which may have a community septic system or rely upon individual septic tank leach field systems.

Providing a collection and treatment system to serve areas with large lots or scattered rural connections is generally not feasible due to the cost of providing pipelines and pump stations to overcome distance and topographic difficulties. This means that all individual disposal systems cannot be abandoned. Although septic tank and leach field systems have possible concerns associated with them, if they are designed, utilized and maintained correctly, concerns can be minimized. Within the County, poor soils make design of a septic tank and leach field of critical importance. In Nevada County the impacts of septic systems can contribute to contamination of groundwater and surface water if the system is inadequately designed, as well as the aesthetic concerns of odor and exposed septage if failure occurs.

Developing an area collection and treatment systems for these rural areas may involve an alternative to the standard types of systems. An area without sanitary service could be designated a zone which is made up of a central collection system and treatment facility for a small community type development and a maintenance program for the surrounding rural areas. The maintenance program might consist of implementing a septic tank pump out cycle of 3 to 5 years as opposed to the 12 year cycle currently practiced. Septage from this pump out could be sent to a regional treatment facility. Currently septage is transported to a treatment facility in Sacramento County.

Other Public Facilities

Public facilities serving the unincorporated portions of the County are provided by a multiplicity of local districts, such as those for fire protection, public schools and local parks, in addition to services provided by the County itself, such as public safety and library facilities. This section identifies needs for three types of public capital facilities: County administrative, public safety (sheriff) and human service facilities; parks; and libraries. It also addresses needs for public schools and fire protection facilities, although these facilities are not the responsibility of the County, and any level of service standards must be set by the individual districts. These facilities, with the exception of County administrative and human service facilities were included in the scoping process for level of service standards completed in August, 1991 as part of the General Plan Update process. (Solid waste facilities were also included in the scoping process, but no specific facility standards were adopted.) A record of the decisions reached in this process is contained in Technical Memorandum No. 16 of the General Plan Update.

Projected future needs for each of the five types of facilities are provided below based upon the projected population at buildout as identified in the land use needs analysis.

County Administrative, Public Safety, and Human Services

The two most important types of capital facilities needed for these services are office space and jail facilities. At the present time, the County has approximately 1,000 full time staff positions, although about 12 percent of the total positions are currently vacant. Including all owned and leased county office facilities, the administrative and related office functions (including those for public safety and human services) occupied just over 222,000 square feet of space in 1991. (The average amount of office space occupied by County services between 1976 and 1991 was just over 214,000 square feet.) This is comparable to national average ratios for office occupancy of between 200 and 250 gross square feet per employee. Assuming that the current ratio of County employees to population (12.5 employees per 1,000 persons) continues in the future, a buildout population of 176,000 persons would require a County staff of 2,200 employees. Using the range of national average ratios, the future need for office and administrative space would be between 440,000 and 550,000 square feet of gross building area.

In the scoping process in 1991, a level of service was established for jail facilities of 1 bed per 1,000 persons. With the construction of the Wayne Brown Correctional Facility, the current ratio is 2.8 beds per person.

Parks

Level of service standards developed by the County Department of Services for Transit, Aviation and Recreation (STAR), suggest a park land standard for 5.0 acres per 1,000 persons in rural areas and 9.5 acres in urban areas. Based upon a buildout population of approximately 61,000 persons in rural areas, outside Community boundaries and 116,000 persons in urban areas within Community boundaries, a total of 1,407 acres of park land would be required (305 acres attributable to population in rural areas and 1, 102 acres of land attributable to population in urban areas.)

The total standard for parks includes both local parks for which municipalities and local park districts would have primary responsibility and regional parks for which the County would have primary responsibility. Based upon a standard of 5.0 acres per 1,000 population for regional parks, the County would need to provide 400 acres of park land to serve the existing population. Although the County owns 82 acres of park land, it is leased to the Western Gateway Park District for operation as a local park facility; therefore, the deficit in County park land to serve existing population would be 400 acres.

Libraries

In the scoping process in 1991, a level of service standard for library facilities was established of 500 square feet per 1,000 population. Based upon this standard, the buildout population of 176,000 persons would require 88,000 square feet of library space.

The four existing facilities in the County library system (including the Local History Branch in Nevada City) have approximately 27,000 square feet of total floor area. This represents less than 70 percent of the total square footage to serve existing population based upon the established level of service standard.

Fire Protection Facilities

Although the 1991 scoping process did not establish level of service standards for fire stations, there was a level of service standard established for paid staff of 1.73 per 1,000 population (compared to the existing ratio of 0.8 staff per 1,000 persons). This standard, which may serve as an indicator of future needs, would require a future paid staff level of 304, in comparison to an existing paid staff level of 64.

Schools

Although not a responsibility of the County, schools were included in the 1991 scoping process, and levels of service for school facilities were established based upon ratios of 55 square feet of building area per student for elementary schools; 75 square feet of building area per student for junior high schools; and 85 square feet of building area per student for senior high schools. Assuming an average of 70 square feet of building area per student for all types of facilities, and maintaining the current student/population ratio of 0.193 for all students (K-12), the buildout population would generate 34,000 students in grades K-12, requiring a total building area of 2,337,760 square feet. At a ratio of 25 students per teacher, this would include a total of 1,360 classrooms, plus supporting facilities.