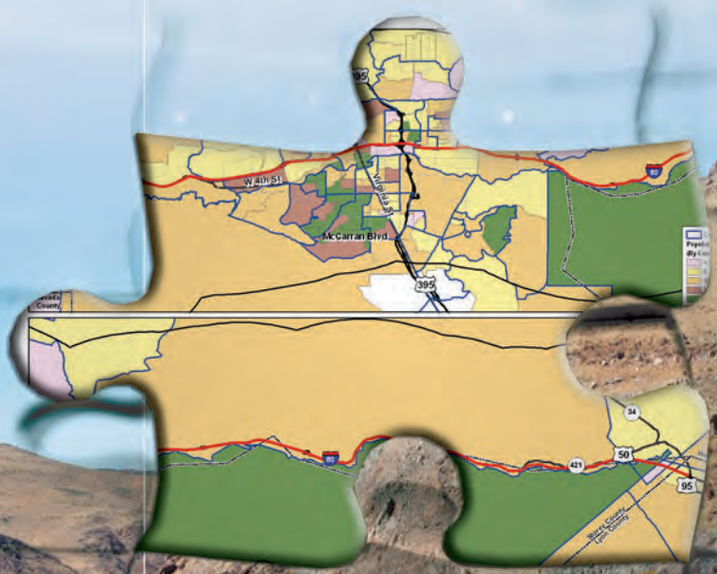
I-80 CORRIDOR STUDY TECHNICAL REPORT

Appendix C
Demographic Data Analysis

PREPARED FOR
NEVADA DEPARTMENT OF TRANSPORTATION



NEVADA DOT

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1.0 Introduction

The I-80 Corridor Study area encompasses I-80 west from the California state line to the West McCarran Boulevard (SR 651) Interchange, and I-80 east from the East McCarran Boulevard (SR650) Interchange in the City of Sparks to east of the Wadsworth-Pyramid (SR 427) Interchange. The study's intent is to provide decision-makers an action plan that will define future transportation needs along the corridor. It is also intended to provide participating agencies with a range of workable and cost-effective transportation alternatives that address current and future needs. These alternatives will be assessed for their socioeconomic, community, environmental, and fiscal impacts.

2.0 Purpose of the Memo

The I-80 Corridor Study will address the need to improve transportation along this corridor by evaluating future land use demands while protecting and using existing resources. The analysis of past and current demographic trends serves as a foundation for projecting future housing, employment, and other land use demands. This technical memorandum focuses on three aspects of demographic data: population, journey-to-work data, and employment; with additional information on historical growth rates and building permit locations. The analysis aims to provide background information to facilitate understanding of the relationships and impacts of historic demographic trends and land use patterns in the I-80 corridor.

This document examines population demographics in terms of historic and current trends with the purpose of identifying where changing dynamics are taking place across the region and within which segments of the population. The analysis includes an investigation of the following factors:

- Population growth trends
- Population density
- Population composition
- Households
- Segregation by income

For journey-to-work information, spatial and temporal analysis is presented to obtain an understanding of trip patterns and characteristics in the corridor area. The analysis includes an investigation of the following factors:

- Travel time to work
- Time leaving home
- Vehicle occupancy
- Modes of transportation

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The biggest trip generators and their spatial relationships with residential land uses will be explored through an analysis of employment data. The analysis includes an investigation of the following factors:

- Employment status
- Employment by industry
- Number of employees by zip code
- Origin and destination survey data

The demographic analysis is supported by data sets collected from the U.S. Census Bureau, Nevada State Demographer, and the Washoe County Regional Transportation Commission (RTC).

3.0 Population

The I-80 corridor within the study area serves the residents and businesses of Washoe County on the west side and Washoe, Storey, and Lyon Counties on the east side. Washoe County's population is approximately 10 times greater than Lyon County's, and 100 times greater than Storey County's; Washoe County therefore generates the majority of the corridor trips.

Washoe County includes the Reno-Sparks urban area, and is the second-largest county, in terms of population, in Nevada. Clark County, home to the Las Vegas urban area, is the largest. The population of Washoe County has been growing rapidly in the past 60 years. This growth has challenged public agencies to provide the needed resources and infrastructure to keep pace with the bourgeoning population. Figure 1 illustrates the population growth in Washoe County from 1940 to 2006.

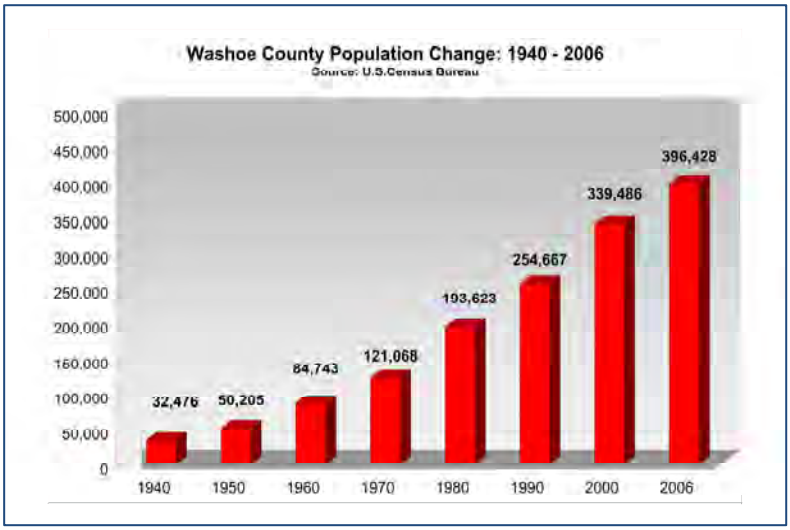

Figure 1. Washoe County Population Growth

3.1 Population Growth Trends

To analyze the overall growth trends, data was obtained from the 1980, 1990, and 2000 Census, as well as the 2006 Community Survey. Tables 1, 2 and 3 display the population statistics for the counties surrounding the I-80 corridor within the study area. The population for the corridor area was calculated by including all census tracts within 5 miles north and five miles south of I-80.

Table 1. Population 1980–2006

Area	1980	1990	2000	2006**
Washoe County	193,623	254,667	339,486	396,428
Storey County	1,503	2,526	3,399	n/a
Lyon County	13,594	20,001	34,501	n/a
Corridor Area*	n/a	n/a	314,362	n/a

**Includes all Census tracts within 5 miles north 5 miles South of I-80*
***Estimated*

Source: U.S. Census Bureau

Table 2. Percent Population Change

Area	% Population Change 1980 - 1990	% Population Change 1990 - 2000	% Population Change 2000 - 2006
Washoe County	31.5%	33.3%	16.8%
Storey County	68.1%	34.5%	n/a
Lyon County	47.1%	72.5%	n/a
Corridor Area*	n/a	n/a	n/a

**Includes all Census tracts within 5 miles north and 5 miles south of I-80*

Source: U.S. Census Bureau

Table 3. Annual Rate of Population Growth

Area	Annual Rate of Population Growth 1980 - 1990	Annual Rate of Population Growth 1990 - 2000	Annual Rate of Population Growth 2000 - 2006
Washoe County	2.74%	2.87%	2.58%
Storey County	5.19%	2.96%	n/a
Lyon County	3.86%	5.45%	n/a
Corridor Area*	n/a	n/a	n/a

**Includes all Census tracts within 5 miles north and 5 miles south of I-80*

Source: U.S. Census Bureau

The 2006 Nevada State Demographer 2006 population estimates for Washoe County, Storey County, and Lyon County are shown in Table 4. This estimate is 3% higher than the population estimated by the American Community Survey.

Table 4. 2006 Population Estimates

Area	2006 Population Estimate
Washoe County	409,085
Storey County	4,110
Lyon County	54,031
Corridor Area*	n/a

**Includes all Census tracts within 5 miles north and 5 miles South of I-80*

Source: Nevada State Demographer

The Washoe County RTC provided the population data from their 2005 model, which is spatially represented in Appendix C1, Figure 2.

As the data indicates, the population of all three counties more than doubled over the 26-year period between 1980 and 2006. For most of this time, Nevada was the fastest-growing state in the country. The main question confronting regional planners in the Reno-Sparks area is whether the recent growth trends will continue unabated into the future. Subsequent technical memoranda will address future growth scenarios within the study area.

3.2 Population Density

Population density data was obtained from the 2000 Census. Figure 3 in Appendix C1 spatially illustrates the population density by quintile. (A description of creating color-coded maps based on quintile method of classification is also provided in Appendix C1.) The graphic shows two high-density sections within the study area. One of these areas is located north of I-80, approximately bordered by I-80 on the south, Sutro Street on the west, and McCarran Boulevard on the north and east. The second high-density area is located south of I-80 just west of the airport and is approximately bordered by Plumb Lane on the north, Pamela Avenue on the east, Peckham and Moana Lane on the south, and Plumas Street on the west.

3.3 Population Composition

Population in general is a composite of ages, gender, and other characteristics, which are useful in understanding how growth will occur in the future and therefore in anticipating demands on the corridor's infrastructure and services.

A cohort-component analysis was performed to describe the composition of the population in the areas surrounding the I-80 Corridor. This analysis uses a pyramid to display the population distribution by age (the cohorts) and by sex (the component). Appendix C1 includes a description of the methodology and population pyramids for Washoe, Storey, and Lyon Counties.

Figure 5 in Appendix C1 shows the spatial distribution of the 65-years-old and older demographic. Two areas include more than 20% of this population: one in the northern part of Storey County bordered by I-80 and the other approximately bordered by Virginia Street to the east, the Truckee River to the north, and McCarran Boulevard to the south and west.

3.4 Households

Household data was obtained from the Census. Table 5 indicates the total number of households and the average household size for each county and for the corridor area. The estimated average household size in Washoe County based on the 2006 American Community Survey is 2.49, which is a slight decrease from the 2000 statistic for Washoe County.

The average household size for the entire nation in 2000 was 2.59. Given the high percentage of seniors living within the study area, and especially within the northern part of Storey County, it is not surprising that the average number of people per household for Washoe County and Storey County is below the national average.

Table 5. Households and Average Household Size

Total Households (Year 2000)				
Area	Washoe County	Storey County	Lyon County	Corridor Area*
Households	132,084	1,462	13,007	123,067
Average Household Size (Year 2000)				
Area	Washoe County	Storey County	Lyon County	Corridor Area*
Average Household Size	2.53	2.32	2.61	2.49

**Includes all Census tracts within 5 miles north and 5 miles south of I-80*

Source: U.S. Census Bureau

The Washoe County RTC provided the household numbers based on their year 2005 model; this is spatially represented in Figure 6 in Appendix C1.

3.5 Segregation by Income

Figure 7 in Appendix C1 displays study area median household income data by quintile. The areas with the highest median income are located in the suburban parts of the Reno-Sparks urban area, within Washoe County. With the exception of the southwest quadrant, they tend to be located outside of the McCarran Boulevard circumferential beltway.

4.0 Journey to Work

The year 2000 Census provides three components of interest for the journey to work analysis: median travel time to work, time leaving home, and vehicle occupancy.

Median travel time-to-work data was obtained at the Census block level. A color was assigned to each predefined time interval and the data was plotted on a geographic information system (GIS)-based map. The spatial illustration of this information is shown in Figure 8 in Appendix C1. As Figure 8 indicates, much of the Reno-Sparks urban area has a commute of less than 19 minutes. Moving east along the I-80 corridor into the more rural parts of the study area, commute times increase to above 30 minutes.

The time-leaving-home data was also obtained at the block level. A color was assigned to each predefined time slice and the data was plotted on a GIS-based map. The spatial illustration of this information is shown in Figure 9 in Appendix C1. To complement this data, a temporal analysis was performed. The number of workers leaving home was plotted against the time of day. The graph indicates that the majority of workers leave home between 7:30 AM and 7:59 AM.

The charts in Appenix C1's Figure 10 display the mode of commuting to work for the three counties surrounding the I-80 corridor area. Similar to other fast-growing western urban areas that have seen much of their growth occur over the past 50 years, the automobile is the dominant mode of transportation within the study area. Public transportation is used by a small percentage of commuters in the Reno-Sparks urban area, and is negligible in the more rural Storey and Lyon Counties. Overall, the mode split for the study area is very similar to the national averages for 2000, summarized in Table 6.

Table 6. Mode of Commuting to Work

Mode	2000 Washoe County	2000 Storey County	2000 Lyon County	2000 National Average
Drive Alone	75%	78%	75%	76%
Carpool	14%	12%	17%	12%
Public Transportation	3%	1%	0%	4.7%
Walk	3%	6%	3%	2.9%
Other	2%	0%	1%	1.2%
Work at Home	3%	3%	4%	3.3%

Source: U.S. Census Bureau

Figure 11 in Appendix C1 shows the spatial representation of the concentration of carpoolers. The quintile method of classification is used to produce the color-coded map. As the figure illustrates, carpooling is concentrated in the more rural parts of the study area, east of the Reno-Sparks urban area. In particular, carpooling's share of all commute trips is 17% in Lyon County.

The same methodology was used to spatially represent the share of workers that use other modes than the automobile to commute to work. Figure 12 in Appendix C1 illustrates the spatial distribution of workers using alternative modes such as walking, bicycling, and public transportation. As the figure shows, the use of alternative modes is fairly confined to the more urban, inner core of the Reno-Sparks region. This area has relatively higher densities, is the focus of the RTC's service area, and has a higher level of pedestrian and bicycle amenities that make these modes a more viable option for commuters.

5.0 Employment

Employment data was obtained from the 2000 Census, the 2006 Community Survey, and North American Industry Classification System (NAICS) data from 2000 to 2005. The charts in Figure 13 in Appendix C1 illustrate the employment status in Washoe, Storey, and Lyon Counties in 2000, and in Washoe County in 2006.

The distribution of employment by industry area is illustrated in the pie-charts in Figure 14 in Appendix C1.

The U.S. Census Bureau Database provides NAICS employment data by state, county, metropolitan statistical area, and zip code, updated annually. However, for this project's study area, 2005 is the latest year available at the zip code level. For the purpose of our analysis, the data was obtained for corridor zip code areas from 2000 to 2005; Figure 15 in Appendix C1 shows the number of employees by zip code for 2005.

Of particular interest to this study, when comparing Figure 3 (where people live) with Figure 15 (where people work), a high degree of overlap exists. The highest concentrations of residential development and employment locations occur within approximately 4 miles of I-80. This concentration of development is roughly contained by the McCarran Boulevard circumferential beltway, with some growth eastward, beyond East McCarran Boulevard along the I-80 corridor. This proximity of residential and employment locations contributes to the relatively low (when compared to other urban areas) average commute times displayed in Figure 8.

The Washoe County RTC provided the employment numbers based on their 2005 model; this information is spatially represented in Figure 16 in Appendix C1.

6.0 Building Permits

The number of building permits from 1996 to 2006 was obtained from the U.S Census Bureau for the City of Reno, City of Sparks, and unincorporated Washoe County. The trend in building permits over time at these areas is illustrated in Figure 17 in Appendix C1. The data indicates that the number of annual new privately-owned residential building permits issued by the City of Reno steadily increasing to 2005, then decreased significantly in 2006, while it remained fairly constant for the City of Sparks and decreased significantly in unincorporated Washoe County in 2006 after increasing in 2004 and 2005. The number annual of new privately-owned residential building permits issued by the City or Reno and unincorporated Washoe County in 2006 is the lowest in the latest 10-year period.

5. References

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Appendix C1

About the Maps and Graphs

Color-coded Maps and Classification by Quantiles. Color-coded maps, otherwise known as "Choropleth Maps," are one of the methods widely used to map census demographic data. To produce a color-coded map, observations are grouped in classes, based on several classification methods. One of the classification methods (used for the analysis in this technical memorandum) uses quantiles (e.g., quartiles or quintiles) to group the data.

This methodology requires to initially rank the data from lowest to highest. Then the data is divided in parts or classes that have an equal number of observations (i.e., roughly one fourth or one fifth of the observations). If quintiles are used as a method of classification, the first class of data contains the lowest 20%, and the fifth or last contains the highest 20% of data values.

In Figure 3, each quintile has approximately the same number of people or population size. In Figure 5, each quintile has the same number of people older than 65. In Figure 7, each quintile has the same population size. In Figure 11, each quintile has the same number of workers who carpool to work. In Figure 12, each quintile has the same number of workers who use other modes of transportation.

Each quintile is colored differently, and the range of values within each quintile is shown in the legend.

Cohort-Component Analysis and Population Pyramids. A population pyramid is a graphical tool used to study the age and sex composition of the population. The pyramid is simply a horizontal bar diagram, where the bars represent the age groups or cohorts. For components, the bars on the left represent females, and the bars on the right represent males. The cohorts begin with the youngest age groups at the base of the pyramid and the oldest age groups at the top. The age cohorts obtained from the 2000 Census are broken into five-year intervals, with an open-ended top category.

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