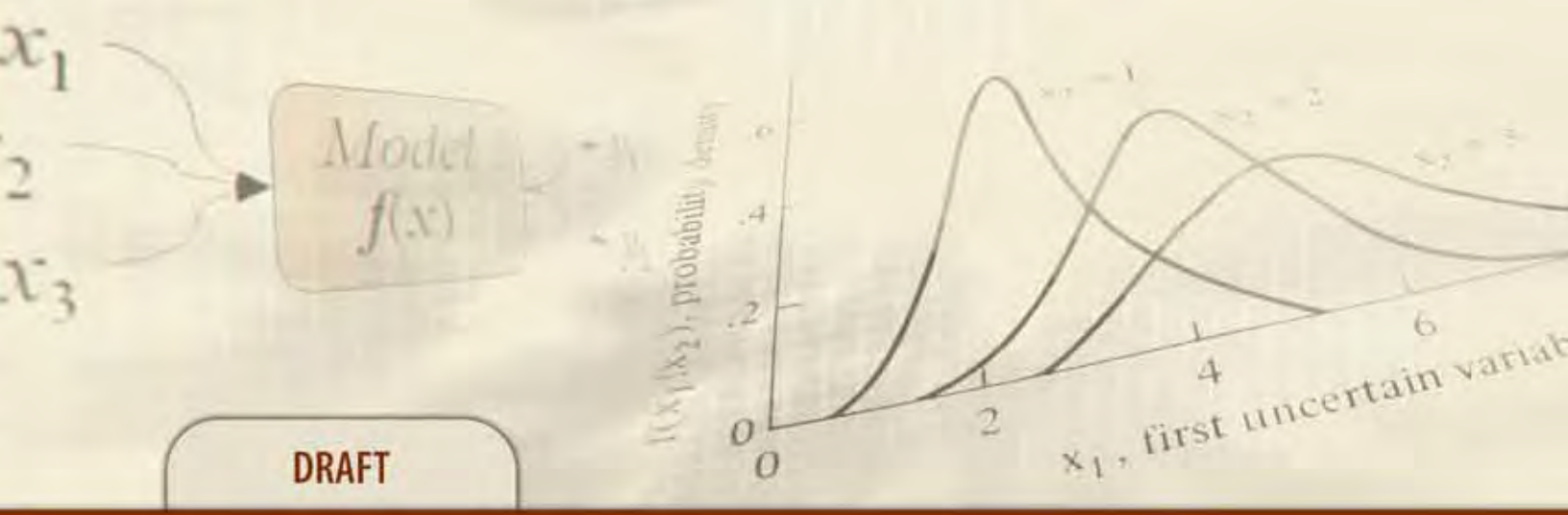
I-80 CORRIDOR STUDY TECHNICAL REPORT

Appendix G
Latent Capacity Analysis

PREPARED FOR
NEVADA DEPARTMENT OF TRANSPORTATION

08082|KD|2009



DRAFT

I-80 LATENT CAPACITY ANALYSIS

APRIL 2009

Technical Memorandum 1
Collected Data

To:	Mike Lawson, Nevada Department of Transportation		
From:	Emily Kubovchik, PBS&J Traffic Program Manager	**Project:**	I-80 Latent Capacity Analysis
CC:			
Date:	August 15, 2008	**Job No:**	100003804.00

1. Introduction

The I-80 Corridor Latent Capacity Analysis 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 (SR 650) Interchange to east of the Wadsworth-Pyramid Lake (SR 427) Interchange.

An I-80 Corridor Study is currently being prepared to provide decision-makers an action plan that will define future transportation needs along the corridor. The study is intended to provide participating agencies with a range of workable and cost-effective transportation alternatives that address current and future needs along the corridor. These alternatives will be assessed for their socioeconomic, community, environmental, and fiscal impacts. The I-80 Corridor Latent Capacity Analysis Study will determine the level of use that degrades the service of the facility, identify types of improvements to maintain or add acceptable service, and establish timeframes for these improvements. The results of this analysis will be used to finalize a plan for the I-80 corridor.

2. Purpose of the Technical Memo

The I-80 Corridor Latent Capacity Analysis Study will address concerns related to the need for improving transportation along this corridor by evaluating future land use demands while protecting and using existing resources. To accomplish this, a large amount of data representing existing conditions and variables that drive development and transportation decision-making need to be collected and organized. Extensive data was collected and summarized in the I-80 Corridor Study Technical Memorandums 1 through 4. For this study, however, much data was updated to reflect current conditions; it is grouped in the following categories:

- Traffic Operations and Engineering
- Land Use Transportation Planning
- Socioeconomic and Economic Development
- Environmental

3. Traffic Operations Engineering Data

Traffic operations and engineering data will be used to analyze baseline freeway traffic operation and to build the baseline FREQ12 model. This data includes hourly traffic counts, average

annual daily traffic, vehicle classification counts, turning movement counts at interchange terminals, freeway segment lengths, grades, travel speeds, freeway geometry, and the Quick Response Freight Model.

Freeway geometrical elements were organized by freeway subsection, with subsection lengths measured using Google Earth. The subsections were defined based on *Highway Capacity Manual* methodology.

The freeway geometry, section lengths, grade, and AADT are summarized in Tables 1 through 4, **Appendix 1A**.

Hourly count data for the mainline and freeway ramps was collected in 2007 and obtained from the Nevada Department of Transportation (NDOT). Hourly counts were collected during one week in 2007, and average annual daily traffic (AADT) values for the mainline and freeway ramps were calculated. Hourly count information and Automated Traffic Recorder summaries are in Attachment **Appendix 1B**.

Vehicle classification counts were collected by NDOT at three locations on the mainline and are included in **Appendix 1C**.

Travel time data for the mainline was collected by the I-80 Corridor Study team and summarized in I-80 Corridor Study, Technical Memorandum 5. Travel time runs indicate that the freeway operates at free flow condition. The average speeds measured from the travel time runs for each freeway subsection were calculated to establish baseline conditions.

Ramp terminal geometry and control and count information were collected by the I-80 Corridor Study team during one week in November 2007, from 7 a.m. to 9 a.m. and from 4 p.m. to 6 p.m. This data is included in the Appendix of the I-80 Corridor Study Technical Memorandum 1. Figure 1 through 4 in Appendix 1-A summarizes this information for both sides of the corridor.

NDOT performed a capacity analysis on the urban core of the I-80 corridor from the Robb Drive Interchange to the Lockwood Interchange. The analysis was based on traffic count data collected at the NDOT count stations in 2007. These numbers will be used as control peak-hour volumes at the boundary of the urban core. A summary of the analysis is provided in **Appendix 1D**.

A Quick Response Freight Model was developed by the I-80 Corridor Study team to calculate future truck volumes based on mainline AADT. This model will be used to calculate the expected truck percentage along the corridor for the 2, 7, 15, and 25 horizon years. A copy of this report is provided in the *I-80 Corridor Study, Technical Report, Appendix H*[1].

4. Land Use and Transportation Planning Data

Land use and transportation planning information was collected to support the timeline component of the I-80 Corridor Latent Capacity Analysis Study process. This information will

[1] This document was originally included in the Appendix 1-E of the Final Latent Capacity Analysis Report.

be customized for each interchange sphere of influence and will be used in the analysis process of the timeline component. The resources described below were accessed for this data.

Truckee Meadows Regional Plan. The third update of this plan was adopted in July 17, 2007. It is a cooperative effort involving a large number of area agencies, organizations, and individuals. The plan includes four modules:

- Module 1 provides direction and standards for how and where development occurs in the Truckee Meadows
- Module 2 addresses the management of natural resources
- Module 3 focuses on the coordination of public services and facilities
- Module 4 the plan's implementation framework

A copy of the Truckee Meadows Regional Plan can be obtained from http://tmrpa.org/.

Washoe County Regional Transportation Commission Travel Demand Model. The Washoe County Regional Transportation Commission (RTC) created a Regional Travel Demand Model to comply with SAFETEA-LU requirements. Traffic Analysis Zone boundaries with socioeconomic data, roadway network information, and trips assigned to the network for 2018 and 2040 were obtained from the RTC.

City of Reno Master Plan – Draft. The Master Plan, currently under Truckee Meadows Regional Plan conformance review, reflects the City's "Making it Great" initiative. The Plan has three levels of applicability: citywide, regional centers and transit-oriented development (TOD) corridors, and neighborhoods.

Information within the citywide portion include plans for policy, population, conservation, housing, land use, public services, facilities and infrastructure, open space and greenways, and historic resources. The land use plan is intended to provide guidance for development and redevelopment for the next 20 years, with the objective of revitalizing former automobile-oriented corridors by addressing mixed-use and transit-oriented development. Master-planned communities and gaming enterprise districts are additional focus areas.

The transportation objective of the Master Plan is to increase percentage of transit use. This will be achieved by:

- Promoting TOD corridors and mixed-use developments.
- Promoting concepts of "complete streets" with travel lanes for transit, automobiles, and bicycles with on-street parking, landscaped parkways, sidewalks, and window shopping areas.
- Designing new roadway projects that support TOD concepts including crosswalks, bicycle lanes, and transit amenities.
- Promoting and making transit available with significant amenities, such as park-and-ride, benches, passenger waiting shelters, bus turn-outs, trash containers, and safe pedestrian facilities.
- Encouraging a grid system of streets with alleys, where appropriate.
- Reviewing and updating infrastructure improvements and capital improvement plans to support and encourage development along TOD corridors.

A copy of City of Reno Master Plan can be obtained from http://www.cityofreno.com.

City of Sparks Land Use Plan. The City of Sparks is in the process of updating its 2002 Master Plan. A copy of the most recent land use plan can be obtained from http://www.ci.sparks.nv.us.

Verdi Draft Area Plan. The Verdi Area Plan responds to a citizen-based desire to identify, implement, and preserve the community's character. The plan conveys the community's desire that its commercial center, long in a state of decline, should be encouraged to develop as a village center serving local citizens, day shoppers, and tourists. The village center should incorporate a historical character to differentiate it from other commercial centers. Development should be grounded in small- to medium-sized businesses providing variety not found in large national and franchise operations. In the document, the village center is referred to as the Suburban Character Management Area (SCMA), and the remaining rural areas are referred to as the Rural Character Management Area (RCMA).

The plan's land use goal for the Verdi RCMA requires a pattern of land use designations to implement and preserve the community character. The plan's land use goals for the Verdi SCMA encourage a mix of land uses and densities to promote a balanced community with residential and commercial compatibility through architectural guidelines, signage and development standards, and business and recreational area guidelines. Large apartment and/or condominium complexes are discouraged.

The plan's transportation goal for the Verdi RCMA requires a safe and efficient transportation system that provides significant regional connections and access to commercial services, public lands, and community employment and recreational areas.

The plan's transportation goals for the SCMA will require property owners/developers to dedicate right-of-way for ultimate street widths; prohibit direct access onto major arterials; limit turning movements through the use of raised medians, acceleration and deceleration lanes, signals, etc.; prohibit curb parking on arterials and collectors; and adopt a traffic and parking plan that develops the historic downtown area as primarily pedestrian.

A copy of the Verdi Draft Area Plan can be obtained from http://www.co.washoe.nv.us.

5. Socioeconomic and Economic Development

The I-80 Corridor Study recognized the difficulty in projecting socioeconomic and economic development information into the distant future. Making these projections for even more distant future timeframes increases their uncertainty. The I-80 Corridor Study team therefore developed an economic model for testing hypotheses about the future, which will be completed and incorporated into the I-80 Corridor Study.

The model uses qualitative, quantitative, microscopic, and macroscopic variables; and the model will yield employee and population projections necessary to estimate traffic patterns.

Macroeconomic variables include:
- Gross domestic product/economic growth
- Employment/unemployment by industrial sector
- Energy prices
- Residential housing market conditions
- Interest rates

Microeconomic variables include:
- Births/deaths
- National and international immigration and emigration
- Employment/unemployment growth
- Existing land uses
- Future/planned land uses
- Local residential housing market conditions
- Demographic factors such as age and ethnicity

These model variables will be generated from national, state, and local historical trends.

Employment projections will be created using the following factors:
- Historical growth in each sector (for example, manufacturing and retail) will be tracked to estimate where future workers will be employed.
- Unemployment rates will be tracked to help relate population to employment.
- Changes in age of population will be examined to eliminate residents of non-employable age.
- Employment projections will be compared to existing vacant land zoned for commercial uses to estimate land constraints.

A description of economic model and macroeconomic variables is in **Appendix 1E**.

6. Environmental Data

Preliminary information on potential environmental areas of concern will support the timeline component of the I-80 Corridor Latent Capacity Analysis Study. The collected information will be customized for each interchange sphere of influence and will be included on the environmental and physical constraints maps. The information originates from the I-80 Rural Corridor Landscape and Aesthetics Plan and from a Draft Environmental Technical Memorandum prepared as part of the I-80 Corridor Study.

I-80 Rural Corridor Landscape and Aesthetics Plan. This plan provides landscape and aesthetics guidelines for highway projects. The guidelines establish qualitative levels of design to meet the objective of each landscape design segment and assist in the successful revitalization and overall landscape and aesthetics improvements for the corridor. Landscape design segments define areas of similar character where the same major design theme is applied. The I-80 rural corridor includes four such segments:
- Sierra Nevada Passage
- Sierra Nevada Great Basin Crossroad
- Truckee River Passage

- Highway of the West

I-80 Draft Environmental Technical Memorandum. This memorandum documents and maps potential environmental resources of concern and provides preliminary baseline information and mapping for environmental and resource management issues within and directly adjacent to the I-80 Corridor Study area. A copy of this memorandum can be found in the *I-80 Corridor Study, Technical Report, Appendix D*[2].

[2] This document was originally included in the Appendix 1-G of the Final Latent Capacity Analysis Report.

Technical Memorandum 2
Baseline Conditions

To:	Mike Lawson, Nevada Department of Transportation		
From:	Emily Kubovchik, Traffic Program Manager	**Project:**	I-80 Latent Capacity Analysis
CC:			
Date:	August 15, 2007	**Job No:**	12345.00

1. Introduction

The I-80 Corridor Latent Capacity Analysis 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 (SR 650) Interchange to east of the Wadsworth-Pyramid Lake (SR 427) Interchange.

An I-80 Corridor Study is currently being prepared to provide decision-makers an action plan that will define future transportation needs along the corridor. The study is intended to provide participating agencies with a range of workable and cost-effective transportation alternatives that address current and future needs along the corridor. These alternatives will be assessed for their socio-economic, community, environmental, and fiscal impacts. The I-80 Corridor Latent Capacity Analysis Study will determine the level of use that degrades the service of the facility, identify types of improvements to maintain or add acceptable service, and establish timeframes for these improvements. The results of this analysis will be used to finalize a plan for the I-80 corridor.

2. Purpose of the Memorandum

The I-80 Corridor Latent Capacity Analysis Study will address concerns related to the need for improving transportation along this corridor by evaluating future land use demands while protecting and using existing resources. The purpose of this memorandum is to establish the baseline variables—and the relationships between them—for the study's operational analysis. Current freeway capacity will be assessed using FREQ12 software. Like all simulation models, FREQ12 requires a specific format for input data; so the variables need to be formatted to meet the format requirements. This memorandum describes the existing baseline data formatting process and the planning and operational variables and their relationships. An overview of the FREQ12 model and its requirements is considered appropriate to facilitate understanding of the data formatting process.

3. FREQ12 Model and Requirements

FREQ12 is a macroscopic simulation program designed for analyzing freeway systems. Although it uses a demand–supply analytical framework and Highway Capacity Manual (HCM) techniques, FREQ12 analysis is more sophisticated than HCM procedures because it

simultaneously analyzes the entire freeway and all its ramps within a corridor. The model considers the impacts of queue spillbacks during congested freeway periods and provides detailed measures of overall system performance.(1)

FREQ12 has been rewritten as a Windows application with added features to simplify data entry. The FREQ12 integrated system of models includes speed-flow relations that are included in the 2000 HCM. On-screen color graphic displays of the analysis are included in the output options. The latest version of FREQ12 can analyze an on-freeway high-occupancy vehicle (HOV) facility in combination with ramp metering.(2)

FREQ12 can also analyze a one-directional freeway corridor with one arterial or a group of "bundled" arterials. The current version of the model can analyze approximately 50 to 100 miles of freeway corridor with a maximum of 158 subsections, 78 origins, and 78 destinations.(2)

Subsection boundaries are established at any location where a change in demand and/or capacity exists. A change in demand will occur at any ramp location, and the change in capacity will occur at any location with situations such as significant grade changes or lane drops/additions.

Unlike HCM, FREQ12 has the ability to simultaneously analyze consecutive time intervals. Because of the availability of 15-minuted counts, the most common time interval used in freeway operations analysis is 15 minutes. Depending on the desired frequency status of traffic congestion, shorter or longer time intervals can be selected.

The freeway design default values or other design values selected based on experience or field studies can be entered into the software for the entire freeway section or for each subsection.

Subsection data required by FREQ12 include:

- Number of mainline lanes
- Subsection length
- On-ramp/off-ramp identification within subsections
- Number of lanes on the ramp
- Free-flow speed
- Subsection gradient
- Truck percentage
- Diesel truck percentage
- Mainline volume at the beginning section
- Ramp volumes
- Ramp capacity
- Subsection capacity

The freeway design default variables that include subsection grade, truck percentage, and diesel truck percentage are used only in the calculation of emissions, fuel consumption, and weaving capacity.(3)

Capacities of freeway facility elements must be estimated before the analysis and entered into the software for each specific freeway subsection. When analyzing freeway operations and estimating capacity, FREQ12 uses units of vehicles per hour, not passenger cars per hour (used by HCM). There are four types of freeway subsections-basic, on-ramp, off-ramp, and weaving-and each may require a specific procedure to estimate capacity. The capacity of a subsection that includes on-ramp and off-ramp but does not qualify as weaving subsection may be ruled by the capacity of either area, whichever is more critical.

A freeway performance table included on the FREQ12 output is provided for each timeslice and includes speed, density, and level of service for each subsection. The bottom portion of the freeway performance table provides travel time and delay information for the freeway, ramps, and combined freeway-ramps in vehicles per hour and passengers per hour for the timeslice.

4. Baseline Traffic Operational Data

The baseline traffic operational data includes network geometry information, free flow speeds, freeway and ramp volumes, freeway and ramp capacities, and truck percentages, each described below.

Network Geometry Information

The I-80 Corridor Study area is comprised of two sections on each side of the Reno-Sparks urban area. On the west, approximately 7 freeway miles extend from the California-Nevada border to the West McCarran Interchange. On the east, approximately 26 freeway miles extend from the East McCarran Interchange to the Wadsworth-Pyramid Lake Interchange.

Aerial photos and plans provided by the Nevada Department of Transportation (NDOT) were used to determine freeway and ramp lane geometry and subsection lengths. The freeway elevations obtained from the travel time runs were used to calculate the gradient for each freeway subsection. Speed limit information along the freeway was collected from field reconnaissance. Figures 1-6 in the **Appendix 2A** include data for each subsection of both study sections.

Freeway and Ramp Volumes

The I-80 Corridor Latent Capacity Analysis Study will identify the volume thresholds when the freeway operations begin to degrade. The analysis will not specifically address the operational effects of congestion such as queue length and congestion time. A one-hour time interval was therefore considered appropriate for the level of analysis to be conducted.

An analysis of NDOT's hourly count data revealed that the peak hours occur generally from 7 a.m. to 8 a.m. and 4 p.m. to 5 p.m. The second-highest weekday traffic volume within the specified peak hours was selected for analysis. Note that the counts were taken in different months of the year. To comply with the software requirements, the origin and destination volumes were adjusted to balance as close as possible with the mainline volumes for both the a.m and p.m time periods. The percent change of the balanced volumes from the actual counts

were calculated and compared to the seasonal variation factor. Except for the eastbound direction in the west section of the corridor, the percent change of the balanced volumes is very close to the seasonal variation factor. The morning peak-hour balanced volumes for the eastbound direction on the west section are 23% lower in the Verdi and West Verdi areas. The afternoon peak-hour balanced volumes are approximately 12% lower in the midsection area. Tables 1-4 in the **Appendix 2B** summarize the volume balancing process.

Freeway and Ramp Capacities

Because no field studies are available that estimate freeway segment capacity in areas where demand exceeds capacity, a vehicles-per-hour estimate is required. This procedure must take into consideration the type of terrain as well as truck percentages along the corridor.

The procedure outlined in the *Highway Performance Monitoring System Field Manual* was used to estimate freeway capacity. For urban freeway sections, the capacity was estimated assuming a Peak-Hour Factor (PHF) of 0.9 and four alternatives of truck percentages varying from 5% to 20%. Recently performed travel time runs indicated that existing peak-hour traffic volumes are operating under free-flow conditions. Using the posted speed limit as a free-flow speed was therefore considered appropriate.

For rural freeway sections, the capacity was estimated assuming a PHF of 0.88, two alternatives of driver type, two types of terrain, and four alternatives of truck percentages. Tables 5-7 in the **Appendix 2B** summarize the freeway capacity calculations.

Note that freeway capacity calculations need to be adjusted for each horizon year, based on the proposed incremental improvements.

Ramp capacities will initially be assumed in the range of 1,300 to 1,500 vehicles per hour unless ramp terminal intersection constraints indicate a lower capacity.

Truck Percentages

I-80 subsection peak-hour truck percentages were based on NDOT classification counts collected at two locations. For the west section of I-80, the percentages were based on data collected on May 16, 2007, at a location east of the California-Nevada border. For the east section, the percentages were based on data collected on April 18, 2007, east of the Pyramid Highway Interchange. The data collected at these locations is representative of average annual weekday traffic volumes. The truck percentages for the morning and afternoon peak hours were derived by dividing the total of the buses, single-unit trucks, single-trailer trucks, multi-trailer trucks, light trucks, and heavy trucks by the total of all vehicles per direction at both collection sites. The morning and afternoon peak-hour truck percentages in the baseline conditions will be applied to all freeway sections and all freeway on- and off-ramps.

5. Relationship Between Planning and Operational Variables

This study provides a comprehensive planning process for identifying future transportation infrastructure improvement projects. Achieving this objective requires establishing relationships between planning and operational variables, each serving valuable purposes. A strategy must also be established for carrying these relationships forward. The main planning variables involved are annual average daily traffic (AADT) on a specific roadway segment, the K-factor (proportion of AADT occurring in the 30th peak hour), directional split factor D, and vehicle occupancy. To evaluate the performance of the system in the future, a combination of these variables that represents the directional design hour volume (DDHV) expressed either in vehicles per hour or passengers per hour is used to estimate the expected vehicle or passenger delay. If the expected delay exceeds the Level of Service D threshold agreed upon by the state or regional agencies, a set of improvements is recommended.

An evaluation of the relationships between the AADT, peak-hour volumes, and DDHV facilitates the process of assigning the most reasonable future peak-hour volumes that will be used in the operational latent capacity analysis, considering the expected trend of the K- and D-factors due to changes in the surrounding land use. Tables 8-11 in the Appendix 2B demonstrate the existing relationships between variables. The K-factor was calculated based on the 30th highest average daily traffic (ADT) of the year and was obtained from the permanent count stations in the corridor study area. The D-factor was calculated by NDOT for the entire corridor; it is 50%.

Comparing the design-hour volume (DHV) with the balanced peak-hour volume indicated that the percent change is more significant in rural areas than in urban areas. This may be due to the fact that the morning and afternoon peak-hour volumes in the urban areas are represented well by the .08 K-factor derived from the urban Automated Traffic Recorder (ATR). The .10 K-factor derived from the rural ATR, however, results in a DHV overestimation for the rural subsections of I-80. In rural areas, traffic volumes may be more equally distributed during the day, and peak-hour volumes may be higher on weekends due to the recreational destinations in the west section. Further discussions on appropriate K-factors for rural areas are recommended.

6. References

(1) Eul-Bum Lee, Changmo Kim, John T. Harvey, *Application of Macro- and Microscopic Simulations for the Traffic Planning of Urban Highway Reconstruction,* Transportation Research Board 84th Annual Meeting January 9-13, 2005, Washington, D.C.

(2) *Institute of Transportation Studies, University of California at Berkeley*, http://www.its.berkeley.edu/research/freq.html last accessed on August 14, 2008.

(3) Dolf May, Lannon Leiman*, Freeway Analysis Manual,* Institute of Transportation Studies, University of California at Berkeley, March 10, 2005

Technical Memorandum 3
Background Conditions

To:	Mike Lawson, Nevada Department of Transportation		
From:	Emily Kubovchik, PBS&J Traffic Program Manager	**Project:**	I-80 Latent Capacity Analysis
CC:	Jeff Lerud, Randy Travis, Nevada Department of Transportation		
Date:	November 13, 2008	**Job No:**	100003804.00

1. Introduction

The I-80 Corridor Latent Capacity Analysis 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 (SR 650) Interchange to east of the Wadsworth-Pyramid Lake (SR 427) Interchange.

An I-80 Corridor Study is currently being prepared to provide decision-makers an action plan that will define future transportation needs along the corridor. The study is intended to provide participating agencies with a range of workable and cost-effective transportation alternatives that address current and future needs along the corridor. These alternatives will be assessed for their socioeconomic, community, environmental, and fiscal impacts. The I-80 Corridor Latent Capacity Analysis Study will determine the level of use that degrades the service of the facility, identify types of improvements to maintain or add acceptable service, and establish timeframes for these improvements. The results of this analysis will be used to finalize a plan for the I-80 corridor.

2. Purpose of the Technical Memo

The I-80 Corridor Latent Capacity Analysis Study will address concerns related to the need for improving transportation along this corridor by evaluating future land use demands while protecting and using existing resources. To maintain the functionality of I-80 it is important to identify the incremental improvements needed due to the developments along the I-80 Corridor. To assist in this objective the background traffic for 2, 7, 15 and 25 years was estimated based on historical traffic counts at permanent count stations along the freeway and an operational analysis of the conditions for each horizon year has been performed. The background conditions represent a baseline for the future operations of the freeway and assume that no development occurs along I-80 within the study area limits. Based on the AADT projections for each horizon year the peak hour traffic volumes have been calculated, operational analysis of the freeway has been performed and potential problem areas have been identified.

3. Background Traffic Projections

Historical AADT counts from permanent count stations along I-80 were used to estimate the future background traffic. This data consists of AADT counts collected over the past 30 years at

2270 Corporate Circle, Suite 100
Henderson, NV 89074
Phone 702.263.7275
Fax 702.263.7200
www.pbsj.com

Nevada/California Stateline, West of US 395, East of Pyramid Highway, East of Vista Boulevard, East of USA Parkway and West of Lockwood interchange.

The background vehicular traffic traveling along the I-80 corridor can be categorized based on their origin and destination patterns. For the purpose of this analysis the following categories were distinguished:

1. Interstate traffic: vehicular traffic that has its origin and destination outside of Nevada.
2. Interstate-Urban traffic: vehicular traffic that has either origin or destination within the Reno-Sparks urban area and in states east or west of Nevada
3. Wadsworth-Fernley Traffic: vehicular traffic that has either an origin or destination in the Wadsworth-Fernley area.
4. USA Parkway traffic: vehicular traffic that has either an origin or destination in the area surrounding USA Parkway interchange.

To estimate the background traffic growth based on the historical data the following assumptions were made:

- The background traffic is generally a combination of the above categories that will grow differently depending on the location.
  - The traffic recorded at the CA/NV stateline is a combination of the interstate traffic and the traffic that travels from California to the Reno-Sparks urban area.
  - The traffic recorded west of the Lovelock interchange is the best approximation of the interstate traffic travelling from California or Reno-Sparks urban area to the subsequent eastern states.
  - The traffic recorded east of USA Parkway is a combination of the interstate traffic and the traffic generated by or attracted to the Wadsworth- Fernley area.
  - The traffic recorded east of Vista Boulevard is a combination of the interstate traffic, the traffic generated by or attracted to the Wadsworth- Fernley area and the traffic generated by or attracted to USA parkway.
- The interstate traffic projections calculated west of the Lovelock interchange were assumed to be unchanged for the purpose of the analysis consistent throughout the corridor.
- The growth projected due to the development south of USA Parkway interchange will be adjusted accordingly if needed during the Latent Capacity analysis when the estimated number of trips generated by or attracted to this area is adjusted for each horizon year based on the workshop results and Storey County input.
- The traffic generated by or attracted to the Reno-Sparks urban area that travels to and from eastern states was considered negligible.

Based on the above assumptions the traffic volumes at each location were disaggregated to reflect the four categories of traffic and the different growth patterns that each of them demonstrate.

A nonparametric regression estimation was performed to project the AADT for each horizon year at the permanent count stations. The two "best fit" curves were selected for each set of data using SPSS software, and the highest and the lowest estimated volume was obtained for each horizon year. A summary of the estimates and the graphical representation of the projected AADT for each permanent count station location are provided in Tables 1 through 4 and Figures 1 through 4 in **Appendix 3A**. The regression analysis shows that the "best fit" curve for the high estimate for both Lovelock traffic and urban traffic at the NV/CA Stateline is linear. Therefore the assumption that the urban traffic on the east side of the corridor is negligible does not affect the estimate of the background traffic on the west side of the corridor.

To convert the AADT into peak hour volume the existing K-factor measured at each permanent count station and the existing peak hour directional volume split was applied to the projected AADT. The background growth assumes that no development will occur along I-80 within the study area and therefore an adjustment of the K-factor for each horizon year was not applied at this stage of the analysis. A summary of the projected peak hour volumes along the freeway due to the growth of the background traffic for each horizon year is summarized in tables 1 - 32 in **Appendix 3B**.

4. Operational Analysis of the Background Conditions

Projected peak hour background data was used to analyze background freeway traffic operation and to build the background FREQ12 model. Freeway geometrical elements were organized by freeway subsection, with subsection lengths measured using Google Earth. The subsections were defined based on *Highway Capacity Manual 2000* methodology and the section capacities were calculated according to the *Highway Performance Monitoring System Field Manual* methodology. A summary of the input variables is provided in Tables 1-32 in **Appendix 3B**.

The operational analysis was performed for each horizon year and for both the high and low estimate. The FREQ12 output is provided in **Appendix 3C**.

The analysis indicates that the west section of I-80 will operate at an acceptable Level of Service D or better for all horizon years under background traffic conditions with the exception of the beginning segment in the westbound direction for the high estimate in the 25 year horizon. The east section of I-80 in the eastbound direction will also operate at an acceptable Level of Service D or better with the exception of the area west of the Sparks Boulevard interchange off-ramp. This location will operate unacceptably by the year 15 and 25 horizon under both the lowest and the highest estimate. The east section of I-80 in the westbound direction operates unacceptably in the area between Sparks and McCarran interchange by the year 2 horizon. The operations of the facility increasingly deteriorate in the areas east of Sparks Boulevard interchange and by the 25 year horizon, the entire east freeway section in the westbound direction operates unacceptably. It should be noted that the operations of the facility are not sensitive to changes in volume which can be observed by comparing the operational level of service under the lowest and the highest

estimate. Tables 1-4 in **Appendix 3C** summarize the results of the analysis, and graphically represent the level of operations on the freeway for each horizon year under the background conditions. An evaluation of these results will not be provided under the cover of this memo as more focused discussion will occur once the latent capacity analysis has been completed.

5. References

Transportation Research Board, H*ighway Capacity Manual 2000*, National Research Council, Washington, D.C.

Federal Highway Administration, *Highway Performance Monitoring System Field manual*.

Adolf May and Lannon Leiman, *Freeway Analysis Manual*, Institute of Transportation Studies, University of California at Berkeley. Sponsored by, Caltrans/UCB PATH Program, California Department of Transportation.

Technical Memorandum 4
Consumption Timeframe

To:	Mike Lawson, Nevada Department of Transportation		
From:	Emily Kubovchik, PBS&J Traffic Program Manager	**Project:**	I-80 Latent Capacity Analysis
CC:	Randy Travis, Jeff Lerud		
Date:	March 17, 2009	**Job No:**	100003804.00

1. Introduction

The I-80 Corridor Latent Capacity Analysis 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 (SR 650) Interchange to east of the Wadsworth-Pyramid Lake (SR 427) Interchange.

An I-80 Corridor Study is currently being prepared to provide decision-makers an action plan that will define future transportation needs along the corridor. The study is intended to provide participating agencies with a range of workable and cost-effective transportation alternatives that address current and future needs along the corridor. These alternatives will be assessed for their socioeconomic, community, environmental, and fiscal impacts. The I-80 Corridor Latent Capacity Analysis Study will determine the level of use that degrades the service of the facility, identify types of improvements to maintain or add acceptable service, and establish timeframes for these improvements. The results of this analysis will be used to finalize a plan for the I-80 corridor.

2. Purpose of the Technical Memo

The I-80 Corridor Latent Capacity Analysis Study will address concerns related to the need for improving transportation along this corridor by evaluating future land use demands while protecting and using existing resources. To maintain the functionality of I-80 it is important to identify the incremental improvements needed due to the developments along the I-80 Corridor. To assist in this objective the expected number of trips for 2, 7, 15 and 25 years will be estimated based on the Washoe County Regional Transportation Commission's 2040 Regional Model by using an uncertainty based approach. A group of experts representing multiple interests and governmental organizations and stakeholders were convened into a workshop with the purpose of exchanging information and making an informed judgment regarding the rate of development within the corridor area. The purpose of this memo is to summarize the methodology used for collecting the experts' opinions and estimating the expected proportion of trips for each of the rolling future horizon years. Specifically, the expert polling results of the workshop will be used in developing the expected number of trips generated within the corridor area due to realization of planned development. Further, this summary details the decision analysis model approach, grounded in uncertainty, which establishes probability distributions for use within a risk management framework.

2270 Corporate Circle, Suite 100
Henderson, NV 89074
Phone 702.263.7275
Fax 702.263.7200
www.pbsj.com

3. Methodology

Broadly, this methodology draws on the following rationale. The Consumption Timeframe component assembles multiple diverse variables affecting latent capacity consumption and establishes a timeline for deploying mitigation measures. An uncertainty-based approach is used to estimate development probabilities along the corridor, based on horizon year information. These development probabilities are applied to trips established in the Washoe County Regional Transportation Commission's 2040 Regional Model.

The uncertainty-based Consumption Timeframe is established through expert opinion, a widely used technique for probabilistic risk and decision analysis (Bedford & Cooke, 2001; Edwards, Miles, & von Wintergeldt, 2007; Morgan & Henrion, 1990). Industry experts are asked about the nature of future events, taking into account risk and uncertainty, which has a long tradition in planning and development (Byrne, 1996). For the I-80 Corridor Latent Capacity methodology, we will engage a broad-based group of experts with diverse backgrounds and interests.

This approach, by which expert opinion is developed, is based on a method developed by the RAND Corporation as a technique for assessing expert opinion, the Delphi technique, through successive anonymous polling of a cross-section of experts (Garvey, 2009; Glotz & Bertschi, 2006; Gordon, 1994; Linstone, Turoff, & Helmer, 2002; Sackman, 1974). The traditional procedure calls for surveying the experts through a series of questions, typically hardcopy questionnaires, which are collected, compiled, analyzed for consensus, reformatted, and returned to the experts for the next round of questions. This procedure is repeated until a reasonable consensus is reached. Delphi has been expanded to include statistical analysis of the experts' opinions (Glotz & Bertschi, 2006; Linstone, Turoff, & Helmer, 2002).

The Delphi technique is tailored for this project by concentrating the opinion-gathering into a one-day workshop. Opinion is gathered in the workshop by way of electronic polling with immediate feedback provided in the form of aggregated opinion distribution as part of the process.

An information packet is provided to all of the intended participants in order for the participants to quickly engage in the process on the day of the workshop. The "backgrounder" was organized by north and south interchange "service sheds" (influence areas). Factors such as land use, development attractiveness, and physical and environmental constraints are compiled into a series of map graphics, which also included a qualitative assessment of the factors by experts on the project support team. A copy of the backgrounder provided to the participants on the workshop is provided in **Appendix 4A**.

Workshop attendees were asked a series of questions. Attendee responses, via anonymous electronic polling, were to consider the qualitative assessments provided in the backgrounder as well as each attendee's expertise and independent judgment.

The workshop also included several breakout sessions allowing for detailed discussion and information exchange amongst the participants. The following page includes an Influence Diagram (Figure 4-1) developed for providing insight into a series of various potential components of land development.

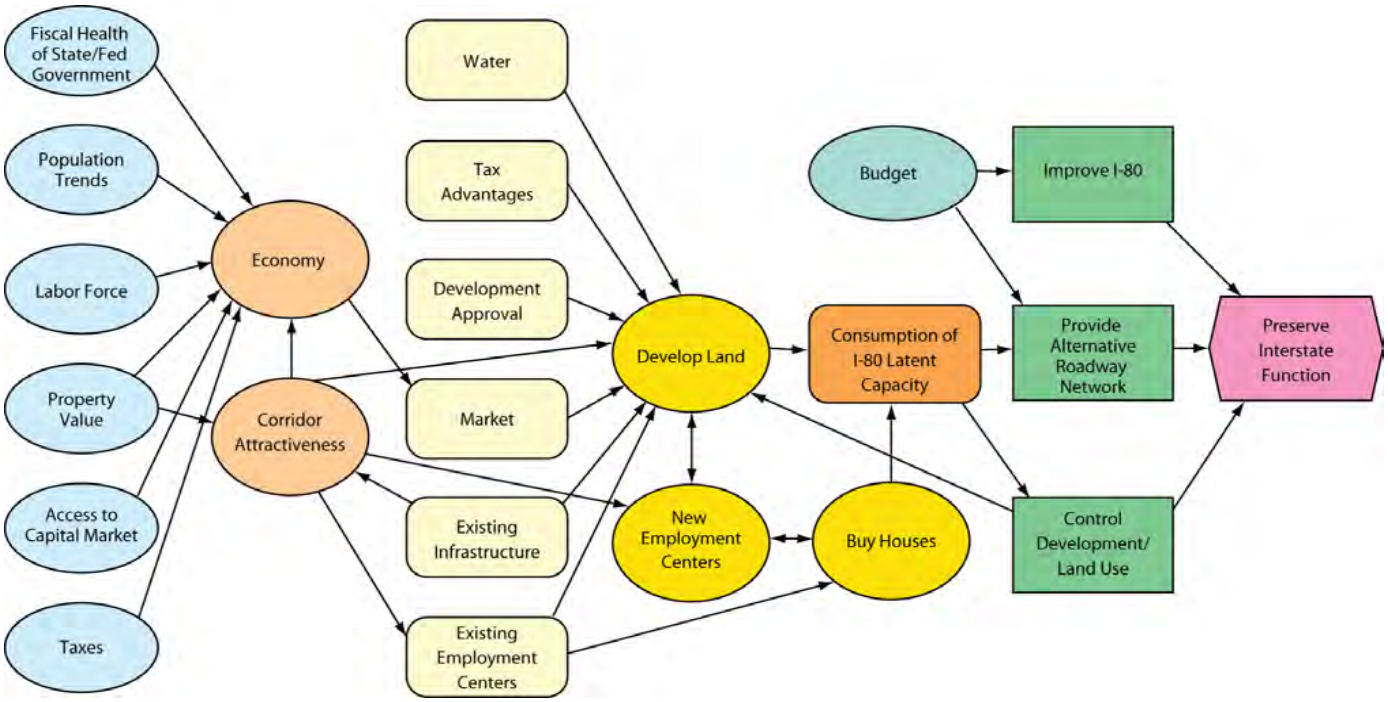


Figure 4-1: Influence Diagram

4. Workshop Results

The resulting percentages (Table 4-1), attained through electronic polling, represent the average percentage for realized development in 7, 15, and 25 year rolling horizons. The information gained through the workshop will provide critical input to the latent capacity analysis and an estimate of future traffic conditions within the corridor. The polling results are included in the **Appendix 4B**.

Table 4-1: I-80 Latent Capacity Realized Development

Horizon Year		7	15	25
Influence Area		**Percent**	**Percent**	**Percent**
W. Verdi	N	22.2	40.4	100.0
W. Verdi	S	17.9	39.2	64.0
Garson	N	23.7	49.2	72.9
Garson	S	13.7	47.3	73.3
E. Verdi	N	46.1	70.8	100.0
E. Verdi	S	27.9	87.6	88.3
Mogul	N	37.0	76.4	100.0
Mogul	S	25.2	66.4	100.0
W. Fourth	N	46.9	74.0	100.0
W. Fourth	S	24.8	51.3	100.0

Horizon Year (con't)		7	15	25
Influence Area		**Percent**	**Percent**	**Percent**
Robb	N	45.0	74.0	100.0
Robb	S	25.0	60.0	100.0
W. McCarran	N	49.6	76.7	100.0
W. McCarran	S	45.4	76.7	100.0
E. McCarran	N	45.0	70.0	86.8
E. McCarran	S	36.2	69.6	100.0
Sparks	N	45.0	70.5	88.2
Sparks	S	22.9	63.5	100.0
Vista	N	15.0	45.2	67.8
Vista	S	14.6	38.8	100.0
Lockwood	N	29.6	OS	OS
Lockwood	S	12.9	73.8	100.0
Mustang	N	11.1	74.6	100.0
Mustang	S	16.1	63.5	100.0
Patrick	N	8.9	42.3	62.3
Patrick	S	32.3	65.0	81.3
USA Parkway	N	17.6	46.4	68.7
USA Parkway	S	13.8	42.3	65.7
Derby	N	16.8	OS	OS
Derby	S	17.2	41.9	61.8
Orchard	N	7.8	OS	OS
Orchard	S	8.9	33.2	53.0
Painted Rock	S	8.1	21.8	OS
Painted Rock	N	4.4	24.1	46.4
Wadsworth	S	10.8	24.5	100.0
Wadsworth		7.6	OS	OS

OS – Open Space

The information collected through expert polling provided the support team with distributions of these averages for each interchange influence area (north and south). An analysis of the data indicated that the average value tends to be closer to zero for the 7 year horizon similar to the distribution shown in Figure 4-2.

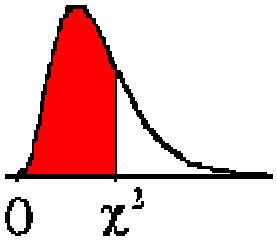


Figure 4-2: Right tale distribution

For the 15 year horizon the average value tend to be closer to the center, similar to the distribution shown in figure 4-3.

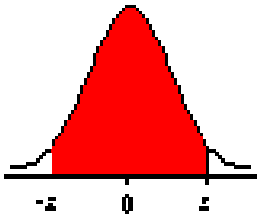


Figure 4-3: Normal Distribution

For the 25 year horizon the average value tends to be closer to 100 similar to the reverse of the distribution shown in Figure 4-2.

To provide a better understanding on the likelihood of the average value a range of values closer to the average was established for each zone's distribution. The probability of the percent realized development for values within the identified range close to the average were calculated for each horizon year. In a similar manner the probabilities of the percent realized development values lower and higher than the average range were calculated and compared with the probabilities of the average range. This information is summarized in Table 4-2 in **Appendix 4C**.

The comparison of the probabilities for the values of percent realized development closer to the average with the probabilities of lower and higher values provides insight on the confidence of the average values and the risk associated with them. A high probability of occurrence of the low and high values of percent realized development is an indication of a higher risk.

A detailed analysis of the risks and the most likely combination of the percent realized development for each zone within their respective distribution will be provided in the Latent Capacity Analysis.

5. References

Bedford, T. & Cooke, R. (2001). *Probabilistic risk Analysis: Foundations and methods*. New York: Cambridge University Press.

Byrne, P. (1996). *Risk, uncertainty, and decision-making in property development*, (2nd Ed.). New York: Taylor & Francis.

Edwards, W., Miles, R. F., & von Wintergeldt, D. (2007). *Advances in decision analysis: From fundamentals to applications*. New York: Cambridge University Press.

Garvey P. R. (2009). *Analytical methods for risk management: A systems engineering perspective*. New York CRC Press Taylor & Francis Group.

Glotz P. & Bertschi, S. (2006). People, Mobiles, and society: Concluding insights from an international expert survey. *Knowledge, Technology, & Policy, 19*(2), pp. 69-92.

Gordon, T. J. (1994). *The Delphi method*. http://www.gerenciamento.ufba.br/Downloads/delphi%20(1).pdf

Linstone, H. A., Turoff, M., & Helmer, O. (2002). *The Delphi method: Applications and Techniques*. Available on the World Wide Web at http://is.njit.edu/pubs/delphibook/delphibook.pdf

Morgan, M. G. & Henrion, M. (1990). *Uncertainty: A guide to dealing with uncertainty in quantitative risk and policy analysis*. New York: Cambridge University Press.

Sackman, H. (1974). *Delphi assessment: Expert opinion, forecasting, and group process*. Available on the World Wide Web at http://www.rand.org/pubs/reports/2006/R1283.pdf

Technical Memorandum 5
Improvement Component

To:	Mike Lawson, Nevada Department of Transportation		
From:	Emily Kubovchik, Traffic Program Manager	**Project:**	I-80 Latent Capacity Analysis
CC:	Jeff Lerud, Randy Travis		
Date:	November 6, 2008	**Job No:**	100003804.00

1. Introduction

The I-80 Corridor Latent Capacity Analysis 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 (SR 650) Interchange to east of the Wadsworth-Pyramid Lake (SR 427) Interchange.

An I-80 Corridor Study is currently being prepared to provide decision-makers an action plan that will define future transportation needs along the corridor. The study is intended to provide participating agencies with a range of workable and cost-effective transportation alternatives that address current and future needs along the corridor. These alternatives will be assessed for their socioeconomic, community, environmental, and fiscal impacts. The I-80 Corridor Latent Capacity Analysis Study will determine the level of use that degrades the service of the facility, identify types of improvements to maintain or add acceptable service, and establish timeframes for these improvements. The results of this analysis will be used to finalize a plan for the I-80 corridor.

2. Purpose of the Memorandum

The I-80 Corridor Latent Capacity Analysis Study will address concerns related to the need for improving transportation along this corridor by evaluating future land use demands while protecting and using existing resources. To maintain the functionality of I-80 it is important to assess necessary infrastructure improvements in a timely manner. To assist in this objective, two matrices were developed as tools to establish timeframes for improvements, the level of use that degrades the service of the facility and the improvements required to maintain acceptable service, as well as the costs associated with the potential improvements. The purpose of this memorandum is to introduce the matrices titled "I80 Corridor Study Improvement Triggers and Indicators Matrix" and "I80 Corridor Study Associated Improvement Costs Matrix". This memorandum describes the improvement categories, their operational characteristics and factors that trigger improvements. The information summarized in the two matrices can be used during the planning and phasing development. In addition to listing some common and probable, improvements the goals of the matrices are to identify the factors that trigger these improvements, the indicators that can be used to monitor the operations, and the estimated costs associated with these improvements.

3. Improvement Category Identification

Based on recent projects with similar constraints and design experience, the team brainstormed a number of common solutions and/or improvements that are used as a means to reduce congestion and increase the system performance and efficiency to an acceptable level. These solutions are not the only options available and are not meant to be limiting in any way. The solutions or improvements that may be employed to increase the performance and efficiency of I-80 were grouped into two major categories; Physical Improvement Solutions and Travel Demand Management Solutions.

Potential Physical Improvement Solutions include:

- Basic Freeway Sections
  - Adding a Freeway Lane
  - Adding Auxiliary Lane
  - Freeway Restriping
- Interchange Areas
  - Freeway Acceleration Lane
  - Freeway Deceleration Lane
  - Widening a Freeway Ramp
  - Ramp Terminal Geometrical Modification
  - Ramp Terminal Intersection Control Modification
  - Arterial Construction
  - Arterial Widening
  - Replacing a Stop Controlled Intersection with a Roundabout
  - Existing Interchange Modification
  - New Interchange
  - Grade Separation

Potential Travel Demand Management Solutions include:

- Access Management
- Transit and Rideshare programs
- Ramp Metering
- HOV priority
- HOT Lanes
- Freight Transport Management
- ITS
- Incident Detections and Management
- Motorist Information Systems

An overall congestion relief and system performance management strategy will likely involve a combination of both these categories of solutions. A detailed analysis of the Travel Demand

Management Solutions and alternatives is provided on the Appendix K of the I-80 Corridor Study, Technical Report.

4. Physical Improvement Solutions

The list of factors that trigger incremental improvements along a freeway corridor was established based on common principles and experience. The performance indicator values associated with the factors were based on Highway Capacity Manual, MUTCD, AASHTO and FHWA methodologies and standards. The main factors that initiate improvements along a highway facility are for the most part related to traffic safety and operation. Although the two of them are interrelated, improvements initiated due to safety concerns are more focused in modifications of the geometry, proper signing and striping. When traffic operational issues are identified, congestion reduction strategies in addition to freeway/road capacity expansion and geometrical improvements need to be considered as alternatives.

The list of factors that trigger incremental improvements and their associated performance indicator values are shown in Table 1, in the **Appendix 5A**. Performance indicator values equating to the upper Level of Service (LOS) D were identified where possible. Due to the complexity of traffic analysis methodologies used in the evaluation of roadway improvements, easily definable LOS D thresholds were not possible for all of the improvement categories. For some of the improvement categories, it is only possible to recommend a methodology by which an improvement strategy can be further evaluated. Alternatively, in some cases only capacity threshold values have been identified.

A delineation of rural and urban areas was not established as urbanization of the rural areas is expected to occur in the future.

4.1 Basic Freeway Sections

Improvements required on basic freeway sections consist primarily of freeway lane additions and are usually needed to accommodate the volume that exceeds the capacity of the existing freeway section. When a basic freeway section's operation exceeds LOS D, as determined by HCM methodologies, then an additional lane needs to be considered. The additional lane can be obtained by restriping or widening the freeway. NDOT can monitor the need for additional capacity by calculating the density along the freeway from the data obtained from loop detectors.

The addition of an auxiliary lane to a freeway section is required to meet the capacity needs or accommodate speed and lane changes of traffic entering and leaving the freeway section. When a standard ramp merge or diverge area's operation exceeds LOS D then an auxilliary lane needs to be considered.

However the identification of locations where the freeway widening or restriping is considered is far more complicated than estimating local capacity gain. Freeway widening or restriping at one location may shift the bottleneck downstream or uncover other hidden bottlenecks which will defeat the purpose of improvement (Yagar and Hui). Following a system approach is necessary

for minimizing the negative impacts on the freeway associated with improvements at specific locations. This approach will enable NDOT to select the most cost effective solutions as well as give the opportunity to evaluate alternatives other than physical improvements.

4.2 Interchange Areas

Improvements required at an interchange area consist of improvements to the mainline, ramps, ramp terminals, modification of the interchange design which in itself may involve a modification to all the elements of an interchange area, construction of a new interchange, or construction of a grade separation. When the operation of an element within an interchange area exceeds LOS D, then mitigation should be considered. Data from I 80 freeway loop detectors, and NDOT Automatic Traffic Recorder (ATR) stations can be utilized to monitor the interchange operations.

Mainline improvements within an interchange area involve modifications to entry or exit areas such as converting freeway acceleration and deceleration lanes from tapered design to parallel design, or modifying the entry or exit areas to accommodate ramp widening or mainline auxiliary lanes. In addition to operational concerns, modifications to freeway entry and exit areas are also necessitated by safety concerns that could be manifested in high accident rates or disruption of freeway operations due to significant speed reduction. Close attention should be given to the human factors and the adverse effect of certain design elements and criteria into the driver behavior. The speeds on the freeway's outside lane tend to be reduced when freeway ramps do not have adequate sight distance and speed-change lane length. This event becomes more obvious under high traffic volume conditions. In merge areas the acceleration length may also be impacted by view obstructions of the outside freeway lane. In this case the true acceleration length will not begin until the drivers view is unobstructed. Field reconnaissance is crucial in evaluating the required acceleration length against the design acceleration length.

Ramp improvements involve ramp widening to accommodate an additional lane or to achieve adequate sight distance. The addition of a ramp lane may increase the capacity of the ramp roadway but not necessarily the capacity of the ramp-freeway terminal (ramp junctions). For this reason an analysis of the merge and diverge influence areas should be performed to decide if an additional ramp lane will improve the operations of the ramp-freeway terminal area.

The capacity of a merge area is determined by the capacity of the downstream freeway segment, therefore the total volume entering the merge area from the upstream freeway segment and the on-ramp should not exceed this capacity. Depending on the freeway volume entering the merge area, the on-ramp volume that can be accommodated by the merge area may not exceed the two-lane roadway ramp capacity even though the demand may exceed this capacity. In this case demand management measures may need to be implemented in order to redistribute the demand on the corridor.

The capacity of a diverge segment is limited by the capacity of the upstream freeway segment, the capacities of the departing freeway leg or ramp and the maximum flow entering the diverge influence area. When the capacity of the downstream freeway segment or the capacity of the off-

ramp is exceeded by the respective demand then additional capacity on the downstream freeway segment or off-ramp may be required to improve the operations of the diverge area or relieve the bottleneck. When the total flow approaching the diverge influence area exceeds the capacity of the two outside lanes, but the total demand is lower that the freeway capacity then a first-in-first-out (FIFO) blockage may occur significantly slowing down the freeway flow. Under these conditions outside lanes upstream of a congested diverge area exhibit higher occupancies than the median lanes (Lawson, 1999). This phenomenon is explained by the fact that the discharge flow is restricted by the lane changes of the exiting vehicles and not by the lack of the downstream capacity. Therefore adding a freeway lane at these locations will not solve the problem. Studies have also indicated that the freeway discharge flow can change significantly without a change in the off-ramp flow when the percent of exiting vehicles changes. The improvements that will relieve the congestion in the diverge areas due to the above conditions include (a) the modification of the off-ramp flow using conventional traffic engineering procedures like modifications in signal timing and coordination and (b) modification of lane assignments by providing "intelligent" overhead lane assignment marking (Munoz and Daganzo,2000).

Where an off-ramp terminates at a signalized or un-signalized intersection, the capacity of the ramp is controlled by the capacity of the downstream intersection. When queuing is observed due to the restricted capacity of the intersection, intersection control improvements of an additional ramp lane may be required.

Ramp terminal improvements involve geometrical and control improvements. Geometrical improvements involve widening of the ramp terminal intersection approaches to accommodate additional turn lanes. Intersection control improvements involve modifications of the existing type of control to a new type of control that would enable the ramp terminal to better accommodate the demand without compromising the operations of the freeway and/or the arterial. Control improvements include converting a non controlled terminal to a stop controlled intersection, and a stop controlled terminal to a signalized intersection or roundabout. The factors that influence the decision in changing the type of control at an interchange terminal include traffic volumes, excessive queuing that may adversely impact the freeway as well as the arterial, or safety concerns. It is recommended that peak hour traffic counts be performed at the ramp terminals on an yearly basis as development justifies. When a ramp terminals operation exceeds LOS D as determined from HCM methodologies, mitigation options should be considered. Consideration of control modifications should include the fulfillment of the MUTCD 2000 Warrants for stop controlled and signalized intersections. For roundabout consideration, volume threshold criteria established by FHWA or best practices should be followed. When a roundabout alternative is being considered the projected future traffic volumes need to be evaluated against the capacity of a roundabout design. If the future volumes exceed the roundabouts capacity, other sustainable alternatives may need to be considered instead.

Additional improvement options associated with ramp terminal improvements are arterial construction and arterial widening. The capacity of the arterial within the ramp terminal area is generally dictated by the capacity of the ramp terminal un-signalized or signalized intersections.

The construction of a new interchange is used to accommodate planned development demands. This option is necessary when existing interchanges within a specific area can't be modified to maintain LOS D operations as determined from HCM methodologies. Grade separation is another improvement option that is used to meet anticipated development demands when minimum spacing criteria for a new interchange can't be achieved, but the existing area interchanges can be mitigated to LOS D.

5. Assumptions and Cost Estimates

At a planning level, general assumptions must be made. The cost matrix shown in Table 2 **Appendix 4A** attempted to expand assumption options to provide more comprehensive choice tables. The matrix includes material choices and cut/fill height choices to give a better estimate depending on the area in question. That asphalt section used consists of 16" Type 1 Aggregate Base, 8" Plantmix Surfacing (Type 2C)(Wet), and ¾" Plantmix Open-Graded Surfacing (3/8")(Wet). The concrete section used was 6" Type 1 Aggregate Base, 3" Plantmix Surfacing (Type 2C)(Wet) and, 13" Portland Cement Concrete. Lane widths are assumed to be 12' unless otherwise noted. Freeway design speed is 70 mph. 1' saw cut from the existing edge of pavement for widening area has been included. All striping is considered epoxy. All new slopes are assumed to match existing.

The overall cost for each improvement is intended as a roadway cost only and does not include costs for other areas of discipline such as drainage, utilities or right-of-way. The cost associated with each improvement does include a 7% Traffic Control cost and 25% Contingency cost.

Assumed unit costs are reflective of current, relevant projects within the community. Unit costs associated with bid items used to estimate the improvement costs are reflective of those found in current projects in the bidding phase and a large NDOT project currently in the design phase. They are intended to reflect current market prices.

5.1 Basic Freeway Sections

Adding a Freeway Lane (Per 100 ft) - This improvement involves adding an entire lane to the mainline freeway section. Widening includes an additional lane while maintaining standard shoulders, shy distance, and a barrier or appropriate slopes.

Adding a Freeway Auxiliary Lane (Per 100 ft) - This improvement involves adding an auxiliary lane between an entrance ramp and an exit ramp along the mainline freeway section. Widening includes an additional lane while maintaining standard shoulders, shy distance, and a barrier or appropriate slopes.

Freeway Restriping (Per 100 ft): Existing Three Lanes to Four Lanes - This improvement involves the removal of existing traffic lines and the restriping of necessary lanes. The typical section is changed from three 12' lanes and two 12' shoulder to four 11' lanes and two 8' shoulders. This option does not include any roadway widening.

5.2 Interchange Areas

Freeway Acceleration Lane - This improvement involves adding an acceleration lane at the end of an entrance ramp to give drivers a chance to accelerate to the freeway running speed before merging into through traffic. The layout assumes an average design speed (35mph) on the ramp and acceleration up to design speed for the freeway (70mph) to calculate length of lane with an appropriate taper length for speed.

Freeway Deceleration Lane - This improvement involves opening up a lane on the mainline before the exit ramp gore area to allow drivers to decelerate before they reach the ramp. The layout assumes an average design speed (70mph) on the freeway and enough length for a vehicle to decelerate to an assumed speed (40mph). The taper is calculated for a length appropriate for the speed.

Widening a Freeway Ramp - This improvement involves widening an entrance or an exit ramp from a single-lane ramp to a two lane ramp. A requirement for this type of ramp widening is a 2500' auxiliary lane prior to the ramp gore. Widening includes the auxiliary lane and the additional lane on the ramp while maintaining standard shoulders, shy distance, and a barrier or appropriate slopes.

Ramp Terminal Intersection Geometrical Modification: Adding Turn Pockets - This improvement adds either a right or a left turn pocket to an existing ramp terminal intersection approach. The roadway is widened enough to add the additional lane while maintaining standard shoulders, shy distance, and a barrier or appropriate slopes. The length of the turn pocket is appropriate for the roadway design speed with 100' of additional storage and the appropriate taper length.

Two Lane Arterial (Per 100 ft) - This improvement is for the construction of a two lane arterial roadway within the ramp terminal area. The typical section consists of standards shoulders and one lane in each direction being separated by a double solid yellow line. There is no median space. Appropriate roadside slopes are accounted for. No additional earthwork is included.

Four Lane Arterial (Per 100 ft) - This improvement is for the construction of a four lane arterial roadway within the ramp terminal area. The typical section consists of standard shoulders and two lanes in each direction being separated by a 12' median. Appropriate roadside slopes are accounted for. No additional earthwork is included.

Six Lane Arterial (Per 100 ft) - This improvement is for the construction of a six lane arterial roadway within the ramp terminal area. The typical section consists of standard shoulders and two lanes in each direction being separated by a 12' median. Appropriate roadside slopes are accounted for. No additional earthwork is included.

Replacing a Stop Controlled Intersection with a Signalized Intersection - This improvement is for the construction of a signal system at an existing stop controlled intersection. The cost for this option does not include any roadway widening or improvements.

Replacing a Stop Controlled Intersection with a Roundabout - This improvement is for the construction of a two-lane roundabout to replace an existing stop controlled intersection.

Bridges - This improvement is for any new bridge or bridge widening that may be needed. The square foot cost was developed taking into consideration different bridge types, span lengths, and other variables within a typical bridge design.

Retaining Walls - This improvement is for necessary retaining walls. Both M.S.E. wall and C.I.P. wall costs have been considered.

New Interchange – This improvement is intended to provide freeway access to the planned developments. There are many different types of interchanges that vary in size and complexity. The cost range provided represents this variety.

6. Improvement and Cost Matrices

The Appendix 5A includes the I 80 Corridor Study Improvement Triggers and Indicators Matrix and the I 80 Corridor Study Associated Improvement Costs Matrix. The goal when creating the matrices was to create a tool that would be useful in planning for the future development along the I 80 Corridor. The matrices attempt to provide a range of roadway improvements and their costs to be evaluated as alternatives that may be necessary for current and future needs along the I-80 corridor.

7. References

Transportation Research Board, H*ighway Capacity Manual 2000*, National Research Council, Washington, D.C.

American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets,* 2001

U.S. Department of Transportation, Federal Highway Administration, Publication No. FHWA-RD-00-067, *Roundabouts: An Informational Guide*, June 2000

Access Management System and Standards, Nevada Department of Transportation, July 1990

Reevaluation of ramp design speed criteria, Center for Transportation Research, The University of Texas at Austin, January 2000.

Bared, Joe. Safety evaluation of acceleration and deceleration lane lengths, ITE Journal, May 1999.

Sam Yagar and Richard Hui. System Wide Analysis of Freeway Improvements, Transportation Research Record 1554.

Congestion Reduction Strategies, Victoria Transport Policy Institute, www.vtpi.org , last visited October 3, 2008.

Lawson, T., Lin, W. H. and Cassidy. M. "Validation of the incremental transfer model" PATH working paper UCB-ITS-PWP-99-16, Inst. Trans. Studies, Univ. of California, Berkeley, CA, (1999)

Munoz, J.C., Daganzo,C.F., "Experimental Characterization Of Multi-Lane Freeway Traffic Upstream Of An Off-Ramp Bottleneck", Inst. Trans. Studies, Univ. of California, Berkeley, CA, (March 31, 2000)

Munoz, J.C., Daganzo,C.F., "The Bottleneck Mechanism of a Freeway Diverge", Inst. Trans. Studies, Univ. of California, Berkeley, CA, (March 31, 2000)

Technical Memorandum 6
Latent Capacity Analysis

To:	Mike Lawson, Nevada Department of Transportation		
From:	Emily Kubovchik	**Project:**	I-80 Latent Capacity Analysis
CC:	Randy Travis, Jeff Lerud, Leif Anderson		
Date:	April 6, 2009	**Job No:**	100003804

1. Introduction

The I-80 Corridor Latent Capacity Analysis 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 (SR 650) Interchange to east of the Wadsworth-Pyramid Lake (SR 427) Interchange.

An I-80 Corridor Study is currently being prepared to provide decision-makers an action plan that will define future transportation needs along the corridor. The study is intended to provide participating agencies with a range of workable and cost-effective transportation alternatives that address current and future needs along the corridor. These alternatives will be assessed for their socioeconomic, community, environmental, and fiscal impacts. The I-80 Corridor Latent Capacity Analysis will determine the level of use that degrades the service of the facility, identify types of improvements to maintain or add acceptable service, and establish timeframes for these improvements. The results of this analysis will be used to finalize a plan for the I-80 corridor.

2. Purpose of the Memorandum

The I-80 Corridor Latent Capacity Analysis will address concerns related to the need for improving transportation along this corridor by evaluating future land use demands while protecting and using existing resources. The purpose of this memorandum is to evaluate how the consumption of the latent capacity will likely occur in the future for each horizon year and identify the most likely improvements that will add service life to the facility. The demand in the corridor for 2, 7, 15 and 25 year horizons is estimated based on the Washoe County Regional Transportation Commission's 2040 Regional Model by using an uncertainty-based approach. This approach uses the knowledge and experience of individuals with varied interests as "experts" to help assess the likelihood and timeframe of future growth within the corridor. This methodology is described in more detail within the "Consumption Timeframe Memo." The results of the expert polling utilized within the workshop are used in developing the expected number of trips generated within the corridor area due to realization of planned development. The freeway's capacity is assessed using FREQ12 software, while the interchange terminal operations are assessed using Synchro and HCS software. As a result of the evaluation of the capacity limitations for each horizon year, a list of improvements for 2, 7, 15, and 25 year horizon has been developed, along with a risk assessment and monitoring matrix that will assist NDOT in planning and prioritizing future facility improvements.

3. Adjustments of RTC's 2040 Demand Estimates

The Washoe RTC provided traffic estimates from their travel demand model for the urban area located within Washoe County. The impact of the Tahoe-Reno Industrial Center (TRIC) and other areas located south of I-80 Corridor within Storey County are captured by the RTC's Travel Demand Model through the projection of external traffic. These areas include:

- South Lockwood Interchange
- South Mustang Interchange
- South Patrick Interchange
- USA Parkway
- East of USA Parkway.

New information was obtained from Storey County and Lyon County regarding the future projections at TRIC and new development along the future USA Parkway. This information was used to adjust the RTC Travel Demand projections as detailed below. A summary of the adjusted 2040 RTC estimated volumes is provided in Table 3.1.

USA Parkway

The information obtained from NDOT and Storey County Planning Department regarding future development along USA Parkway and within TRIC was used to estimate the traffic that will ultimately be generated by this area and its impact on the USA Parkway and Patrick Interchange. The methodology for estimating the future trips and the information used in the analysis is provided in the **Appendix 6A**. The RTC's Travel Demand estimates for USA Parkway were replaced with the new projections shown in Table 3.1 under the "USA Parkway Projections" heading.

New Interchanges

Due to growth within the East Truckee River, the Washoe RTC has anticipated that two new interchanges will be required to accommodate the growth in this area, Spanish Springs Connector Interchange located between Mustang and Patrick, and a new Tracy-Clark Interchange located between Patrick and USA Parkway. In addition, a parallel frontage road system is anticipated between these two interchanges.

The purpose of the Latent Capacity Analysis is to evaluate the timeframe in which the existing facility will be able to accommodate the anticipated growth. Therefore the volumes serviced by the two new interchanges in the Regional Model were distributed to existing interchanges in the horizon year analysis as follows:

- Due to its proximity, 100% of the Spanish Springs Connector Interchange traffic was loaded at the Mustang Interchange.
- 20% of the Tracy-Clark Interchange traffic was loaded at the Patrick Interchange
- 80% of the Tracy-Clark Interchange traffic was loaded at the USA Parkway Interchange.

The reallocated demand is shown in Table 3.1 under the "Reallocation of Demand" heading.

External Traffic

External traffic affecting the west and east side of the I-80 corridor was calculated using a curve fit estimation process described in detail in Technical Memorandum 3 "Background Conditions." A distribution of the future external volumes is not available. Therefore, to account for the variability in the estimate, a range of values represented by a low, medium and a high estimate is considered for each external point. Table 3.2 summarizes the external AADT projections used in the latent capacity analysis estimate.

Table 3.1 – RTC's 2040 Adjusted AADT

Influence Area	RTC's Estimated AADT	USA Parkway Projections	Realocation of Demand	Adjusted Build-out AADT
West Verdi North	10,400	-	-	10,400
West Verdi South	12,300	-	-	12,300
Verdi North	9,800	-	-	9,800
Verdi South	9,100	-	-	9,100
Garson North	24,200	-	-	24,200
Garson South	20,100	-	-	20,100
East Verdi North	13,200	-	-	13,200
Mogul North	1,600	-	-	1,600
Mogul South	1,700	-	-	1,700
West 4th Street South	13,500	-	-	13,500
Robb North	17,900	-	-	17,900
Robb South	14,300	-	-	14,300
West McCarran North	18,600	-	-	18,600
West McCarran South	13,100	-	-	13,100
East McCarran North	27,700	-	-	27,700
East McCarran South	35,400	-	-	35,400
Sparks North	24,100	-	-	24,100
Sparks South	16,800	-	-	16,800
Vista North	48,000	-	-	48,000
Vista South	49,100	-	-	49,100
Lockwood North	16,000	-	-	16,000
Lockwood South	35,200	-	-	35,200
Mustang North	20,100	-	7,300	27,400
Mustang South	28,900	-	8,600	37,500
Spanish Springs Connector North[1]	7,300	-	-	-
Spanish Springs Connector South[1]	8,600	-	-	-
Patrick North	30,600	5,305	6,160	42,065
Patrick South	31,200	5,305	4,420	40,925
Tracy-Clark North[2]	30,800	-	-	-
Tracy-Clark South[2]	22,100	-	-	-
USA Parkway North[3]	14,500	15,915	24,640	40,555
USA Parkway South[3]	12,600	15,915	17,680	33,595

Table 3.2 – Estimated External AADT

Horizon Year	Future AADT		
	Low Estimate	Medium Estimate	High Estimate
External at Nevada/California Stateline			
2 year	30,466	31,281	32,096
7 year	31,697	33,237	34,777
15 year	32,892	35,980	39,068
25 year	33,047	38,739	44,431
External East of Wadsworth Interchange			
2 year	27,773	28,507	29,241
7 year	31,644	33,400	35,156
15 year	37,839	42,016	46,194
25 year	45,582	54,149	62,716

4. Future Demand Estimating Methodology

Future travel demand modeling forecasts are often based on one set of future socio-economic inputs, which results in a single forecasted traffic volume on each highway segment. Less often, a few sets of alternative growth forecasts are produced. Uncertainty in the amount, location and timing of growth in the study corridor led to a risk based travel demand estimation approach for the I-80 corridor that incorporates expert opinion on the growth anticipated in the corridor and applying the anticipated growth to the 2040 RTC Travel Demand Model volume output. A statistical method using Monte Carlo simulation was used to produce many alternative forecasts, which could then be analyzed to develop recommendations.

Travel Demand Model Inputs

Because regional model data was not readily available, basic travel demand model inputs such as networks and trip tables were developed independently. Highway networks for the corridor were developed using U.S. Census Bureau TIGER line files. Aerial photography was used to code basic highway attributes and to ensure proper network connectivity.

Trip tables were developed using Trip Table Estimation (TTE) procedures. TTE procedures assign trip tables to a network and then compare the resulting volumes to observed traffic counts. After trips are assigned, it is possible to sum the observed traffic counts and assigned trips, where counts are available, to determine if too few or too many trips are traveling between the two locations. If the assigned trips are greater than the observed counts, then the trip table can be adjusted to reduce the trips. If the assigned trips are less than the observed counts, then the trip table can be adjusted to increase the trips. When this approach is applied to many different locations simultaneously, adjustments made for one pair of locations may counteract adjustments made for another pair. To overcome these competing adjustments, TTE procedures are iteratively applied, with an adjusted table output from one iteration serving as the input trip table for the next iteration. This process is repeated until relatively small changes occur between iterations.

Monte Carlo Simulation

To develop future trip tables, base year tables estimated using TTE procedures, were adjusted using growth factors at each interchange within the corridor. In order to evaluate the uncertainty

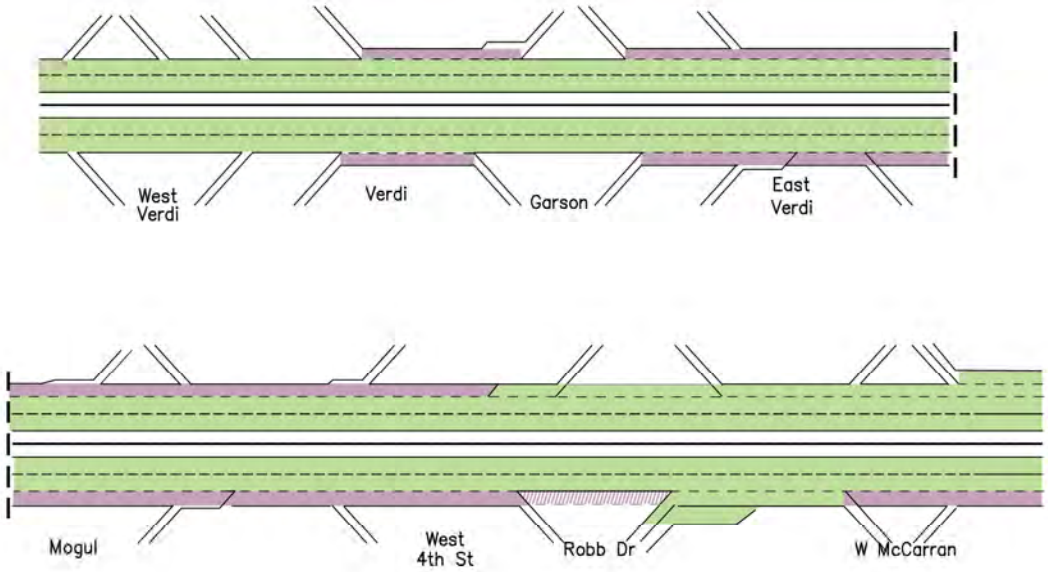
of the growth rates within the corridor, a statistical method was used, Monte Carlo Simulation, that takes into account differing opinions. Monte Carlo simulation randomly samples input frequency distributions to represent the probability of choosing any particular option in the random draw depending on the frequency of the option. When this is repeated many times, the results will generally follow the input frequency distribution.

During the development workshop, a number of people, or experts, were asked their opinions regarding how much growth they expected to take place at each interchange along the corridor within a designated time frame. From this sample of opinions, frequency distributions of responses are developed. For each Monte Carlo run, a random draw (weighted by the sample's frequency distribution) would select one of the growth levels. For one draw, the low growth category might be selected and for another draw, the high growth category might be selected. After many draws, since the sampling is weighted by the frequency distribution of the sample, the resulting selections of growth categories would roughly follow the original sample for example 10% low, 60% moderate, and 30% high. This type of sampling was done at every interchange for each Monte Carlo run. Therefore, for any particular Monte Carlo simulation run, many different growth factors would be drawn for the corridor. At one interchange a low growth estimate may be drawn, while at another interchange a high growth estimate may be drawn. In the next run, the growth category for these two interchanges may be reversed. A result of this growth factor sampling is that forecasted traffic volumes are different for each run. When many runs are made and summarized, it provides a statistical picture of how much the differing opinions impact the forecasted traffic volumes. Results are no longer a single forecasted volume, but are a range of volumes which can be analyzed using typical statistical measures (average volume, minimum volume, maximum volume, frequency distribution of volumes, etc.). The results of the Monte Carlo analysis along with a frequency distribution calculation tool are included electronically in the **Appendix 6B**. The frequency distribution calculation tool is used in performing the risk analysis and risk monitoring.

5. Latent Capacity Analysis

The Latent Capacity Analysis was performed using the average AADT obtained from the Monte Carlo simulation runs. The average AADT values were converted to peak hour volumes based on the parameter values established in the Baseline and Background Conditions memos. The conversion factors and the balanced peak hour volumes for each horizon year are provided in Tables 1 through 16 in the **Appendix 6C**.

To establish the latent capacity within the I-80 corridor, a stepwise process was followed based on reaching performance thresholds. The deficiencies were identified using FREQ12, a macroscopic software, with the performance threshold set at the transition from level of service D to E. Improvements from the Improvements Component memo will then be included into the analysis to ensure acceptable performance is achieved. These improvements are assumed to remain in place for subsequent analysis iteration for the 7, 15, and 25 year horizon. A summary of the FREQ12 output for each iteration is provided in Tables 1 through 12 in **Appendix 6D**. The potential future freeway improvements and their associated timeline are shown in Figures 5.1 and 5.2.



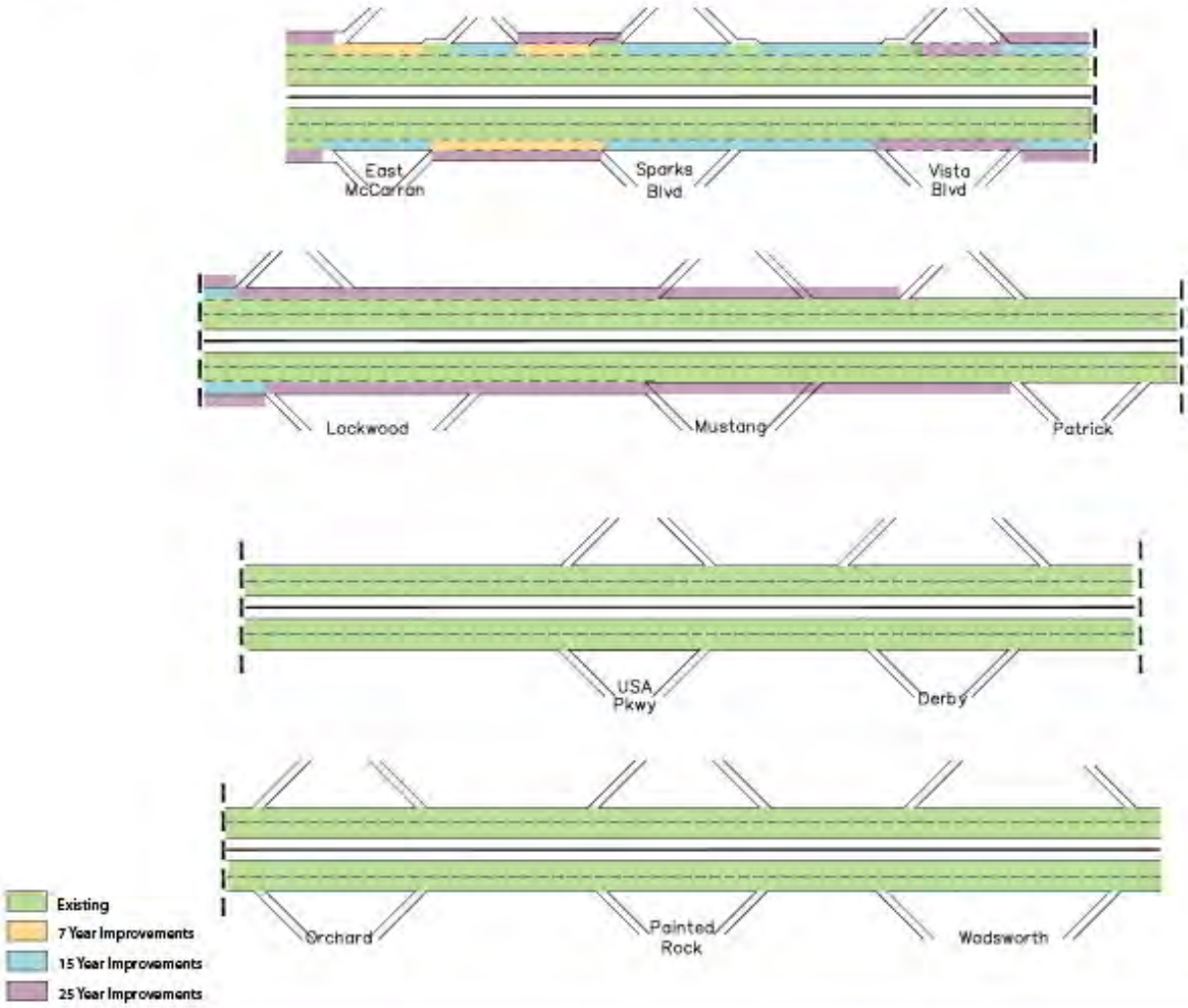
Existing
7 Year Improvements
15 Year Improvements
25 Year Improvements

PBS&J
Latent Capacity

2270 Corporate Circle, Suite 100
Henderson, NV 89074

Phone 702.263.7275
Fax 702.263.7200
www.pbsj.com

FIGURE 5-2 I-80 CORRIDOR EAST - FUTURE IMPROVEMENTS



The impact of increased traffic volumes on interchange terminals was evaluated for each horizon year using the Highway Capacity Software (HCS) and Synchro Software. Extensive development is expected to occur in both sides of the corridor and much of the arterial network, except within the urban area, is either rudimentary or does not exist. Therefore, the projection of future turning movements was extrapolated or adjusted based on the land use information available. Additionally several sensitivity tests were performed to identify the timeline the interchange terminals would require improvements. The deficiencies on the future terminal operations and the recommended solutions are included in the Analysis Worksheets provided in the **Appendix E**.

Need for Additional Interchanges

The need for additional interchanges was evaluated between Lockwood and Mustang Interchange and between Patrick and USA Parkway where the 2040 Regional Transportation Plan (RTP) is recommending the construction of the Spanish Springs Connector Interchange and the new Tracy-Clark Interchange.

The Spanish Springs Connector Interchange included in the travel demand model is a system to system interchange, however based on data received from the RTC, the existing facilities would be able to accommodate the volumes anticipated to occur by the 25 year horizon.

The new Tracy-Clark interchange included in the travel demand model is anticipated to serve the land uses north of the I-80 Corridor between the Patrick Interchange and the USA Parkway Interchange. The Tracy-Clark interchange is anticipated to serve as the linking point between the I-80 Corridor and Tuscarora Corridor which is in very early stages of planning and is currently not included in the RTP. **Appendix ??** provides information regarding this corridor. The Latent Capacity Analysis indicates that a new interchange is not warranted between Patrick and USA Parkway by the 25 horizon. The new interchange may be warranted in the very distant future given the land use and network assumptions provided by the Washoe RTC therefore the monitoring of risk and the update of the latent capacity analysis is recommended when more information becomes available.

Although the Washoe RTC has included these two new interchanges in the 2040 RTP, the Nevada Department of Transportation should note the following issues that would facilitate the monitoring of conditions in the future:

- The new proposed interchanges are located outside of the current urban area. The minimum interchange spacing in the rural areas based on the NDOT's Access Management Systems and Standards, July 1999 is three miles. With the annexation of the East Truckee River area in the near future by the City of Sparks, the north side of the I-80 may change the designation from rural to sub-urban or urban which will reduce the minimum spacing to 1-2 miles.

- Some of the RTP recommendations regarding future improvements within the I-80 corridor are based on the East Truckee River Plan which is neither finalized nor adopted. This plan is

being prepared by the City of Sparks to comply with the Washoe County requirements for annexation. The annexation of this area is expected to occur by 2014, however has recently been put on hold at the request of the developers. The final plan will include the final land use as well as the facility needs.

- The roadway network within the East Truckee River area is unidentified due to the fact that a final plan has not yet been adopted. Therefore the Traffic Analysis Zones (TAZ) in the RTC's travel demand model are not defined by the arterial network. As a result, the centroid connectors load traffic generated by the TAZ's on to I-80 as opposed to loading the arterial network. This means that the trips generated from the TAZ's within the Trukee River area are not assigned to a network following the shortest path methodology, but have to be routed to their destination via I-80 which may be into the adjacent TAZ.

- The approval of new interchanges or access point has to comply with the FHWA Policy on Interstate Access. "This policy is applicable to new or revised access points to existing Interstate facilities regardless of the funding of the original construction or regardless of the funding for the new access points."(Additional Interchanges to the Interstate System, FHWA). A detailed discussion of access management will be provided in an Access Management Memo within the I-80 Corridor Study project.

6. Likelihood Estimation of Projected Trips

The Latent Capacity Analysis was performed based on the average of AADT values generated from 100 Monte Carlo Simulation runs. As a result of this analysis a set of the required freeway and interchange terminal improvement were developed.

The frequency distribution of AADT values for each freeway segment and each horizon year was calculated and graphically represented in Figure 6.1 and 6.2 **Appendix F**. The qualitative analysis of the frequency distributions indicates there are several shapes of the distribution functions. However, there are three primary types of shapes that may indicate the level of certainty of polling experts regarding the timeframe for growth within the corridor:

- The graph has one distinguished peak and very low shoulders. This generally indicates a high certainty surrounding the average AADT value.

- The graph is flat and does not have a distinguished peak. This indicates that the certainty of the average value is lower

- The graph has two distinguished peaks. This indicates that the average value is very uncertain.

The Monte Carlo simulation generates 100 different value scenarios. To assess the certainty of the average value used in the capacity analysis these values are organized into ranges of values, known as bins. The incremental nature of public works investments leads to the use of bins that are associated with the lane capacity expressed in AADT. For this latent capacity analysis the bin ranges are identified as the AADT which requires an additional general purpose freeway

lane. The size of the bin or the range of AADT values within the bin varies by segment based on the K-factor, truck percentage, type of terrain and driver behavior. The calculation methodology and the bin sizes for each segment are summarized in Tables 1 through 4 in Appendix F.

The bins were used to group the data obtained from the Monte Carlo Simulation and calculate the frequency of AADT values within each bin. This information is provided in Tables 5-8 in **Appendix 6F**.

The following is an interpretation of results provided in the table:

The Segment from East McCarran Interchange to Sparks Interchange Eastbound (Table 5: Segment 3)

Average AADT & 7 year horizon: 50,900
AADT Lane Capacity: 22,523

One Lane Capacity: 22,523
Two Lane Capacity: 45,046
Three Lane Capacity: 67,569
Four Lane Capacity: 90,092

The above capacities were estimated using the procedure outlined in the *Highway Performance Monitoring System Field Manual*. These capacities take into consideration all the operational variables and may not be comparable to the planning level capacities associated with travel demand modeling.

The AADT simulation values, from 100 Monte Carlo simulation runs, for this segment were grouped in bins that have the following values:

Bin 1: 0 – 22,523
Bin 2: 22,524 – 45,046
Bin 3: 45,047 – 67,567

The average AADT value used for the analysis falls into the Bin 2 range of values. This range was considered as the average range and all the simulation values that fall within this range would require the same improvements as the average value. All the simulation values that fall into the lower range would not require the improvements or these improvements will occur at a later time. All the simulation values that fall into the upper range would require more improvements or the improvements will occur earlier than anticipated.

The number of values that fall within each bin was obtained from the data and the probability or likelihood for the medium, lower and upper range is established by dividing the number of values in each bin by 100 which is the total number of simulated runs.

The results of the analysis indicate that the average value used in the Latent Capacity Analysis has generally a very high likelihood.

7. Risk Assessment and Monitoring

The purpose of the Latent Capacity Analysis is to provide the Nevada Department of Transportation with a list of most likely improvements in 2, 7, 15 and 25 year horizon as well as with a monitoring tool that will help the planning department to closely monitor the risk that associates the planning and project development process for the identified projects. The Analysis Worksheets in **Appendix E** provide a preliminary list of the events that would impact the estimated timeline of the anticipated projects. The list of these events is a combination of threats and opportunities that would impede or accelerate the entering of a project into the design and implementation phase. The Risk Management Plan Matrix included in the Appendix G is prepared based on guidelines provided by FHWA in "Risk Assessment and Allocations for Highway Construction Management" and NCHRP Report 574 "Guidance for Cost Estimation and Management for Highway Projects During Planning, Programming and Preconstruction". The purpose of this plan is to facilitate the work of the Planning and Programming department in monitoring the events that would impact the program implementation timeline and the scope of the identified projects. The monitoring and control of risk is anticipated to be an ongoing process that will continue in other phases subsequent to programming and project development. A summary of the risk assessment process is shown in the following Figure 7.1. The risk management plan template provided in the **Appendix G** can be used for each identified program on the I-80 Corridor Study and additional ones can be created in the future. The plan tracks and monitors the identified risks, identifies new risks, ensures the execution of risk plans, and evaluates their effectiveness in reducing risk. Four major tasks distinguished in the Risk Assessment Process and reflected on the Risk Management Plan include:

- Risk identification
- Risk analysis/assessment
- Risk response strategies
- Risk Monitoring and Control

The risks associated with the components of the I-80 Corridor can be identified using the Influence diagram provided under the Timeline Component Memo, and the recommendations and concerns of the study group. The list of program risks may change in the future as the program matures. New risks may be identified and some of the anticipated risks may disappear. The plan worksheet will serve as a tool for the department to periodically review and update the risk and repeat the four major tasks of identification, analysis, response strategies and monitoring. The updating process may result in changes on the risk rate which will result in changes in the response strategy. To assess the risk rate a Risk Assessment Matrix suitable for program planning and development has been developed. The following Figure 7.2 shows the Risk Assessment Matrix and the guidelines in evaluating the severity and likelihood. The risk matrix used in the analysis is a simplified version of the shown matrix and includes three levels of risk severity and three levels of risk likelihood. The severity of risk and the likelihood evaluation can be performed either qualitatively or quantitatively depending on the availability and type of data.

The risk analysis and assessment serves as a starting point in choosing the response strategies, prioritizing actions, identifying projects or re-planning a program.

Risk monitoring and control is anticipated to be a team work process. A task manager should be assigned to each risk category for all identified programs who should report periodically to the project/program manager on the effectiveness of the plan, any unanticipated effects, and any mid-course correction that the department must take to mitigate the risk.

Figure 7.1 Risk Assessment Process

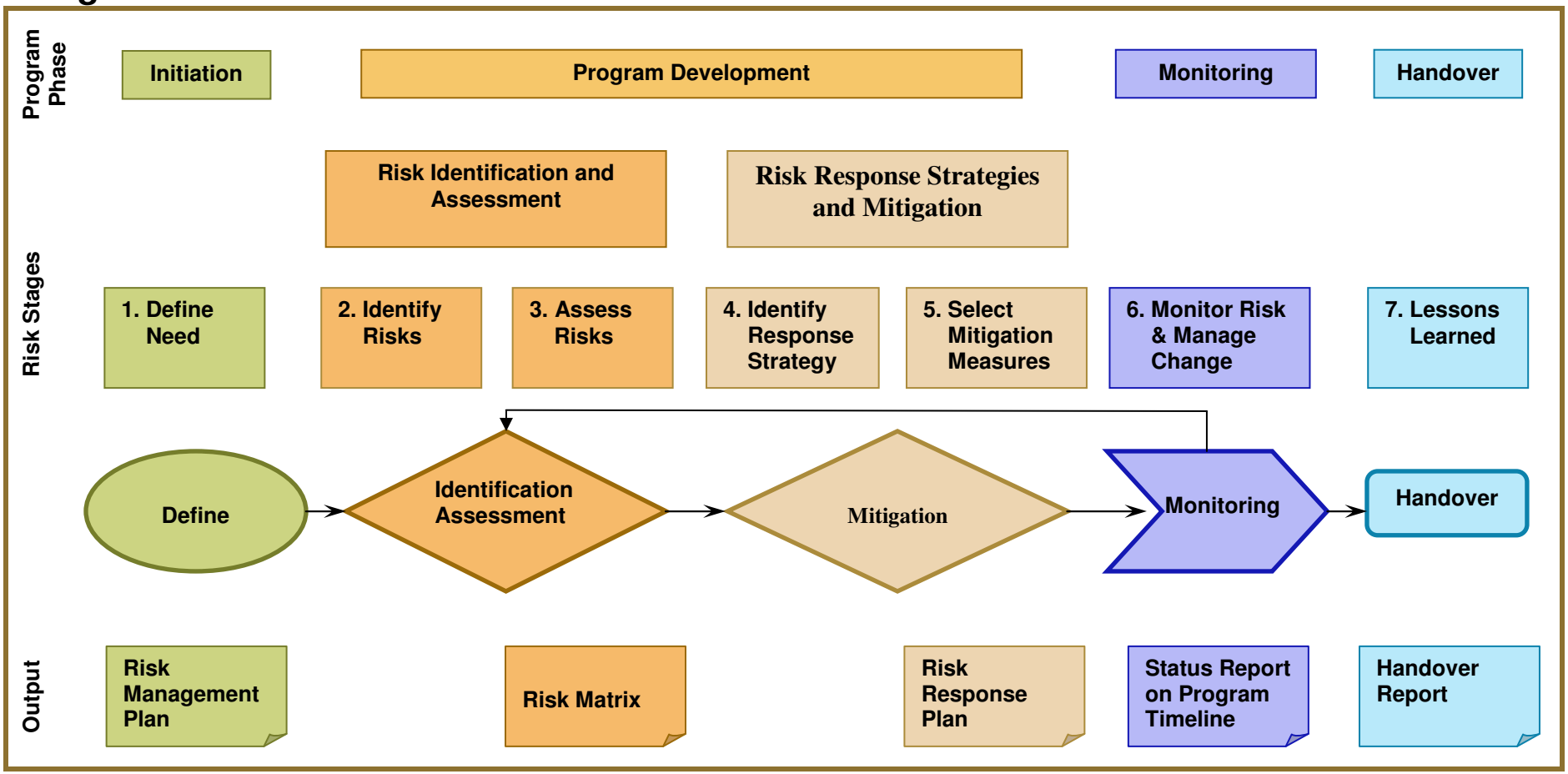


Figure 7.2 Risk Assessment Guide

Level	Likelihood
A	Remote
B	Unlikely
C	Likely
D	Highly Likely
E	Near Certainty

ASSESSMENT GUIDE

Likelihood	a	b	c	d	e
E	M	M	H	H	H
D	L	M	M	H	H
C	L	L	M	M	H
B	L	L	L	M	M
A	L	L	L	L	M

Consequence

Level	Schedule	and/or	Cost
a	Minimal or no impact		Minimal or no impact
b	Additional resources required; able to meet		<5%
c	Minor slip in key milestones; not able to meet need date		5-7%
d	Major slip in key milestone or critical path impacted		7-10%
e	Can't achieve key team or major program milestone		>10%

RISK ASSESSMENT

High (Red)
Unacceptable. Major disruption likely. Different approach required. Priority management attention required

Moderate (Yellow)
Some disruption. Different approach may be required. Additional management attention may be needed

Low (Green)
Minimum impact. Minimum oversight needed to ensure risk remains low

Source: FHWA

8. References

(1) Paula Martin, Bruce Chadbourne, *The Professional Guide to Risk Assessment,* Martin Training Associates, 2004.

(2) *Risk Assessment and Allocation for Highway Construction,* FHWA, October, 2006.

(3) *Guidance for Cost Estimation and Management for Highway Projects during Planning, Programming and Preconstruction*, NCHRP Report 57, Transportation Research Board, 2007

Technical Memorandum 7
Foundational Research

To:	Mike Lawson, Nevada Department of Transportation		
From:	Emily Kubovchik, Traffic Program Manager	**Project:**	I-80 Latent Capacity Analysis
CC:	Jeff Lerud, Randy Travis		
Date:	January 27, 2009	**Job No:**	100003804.00

1. Introduction and Overview

The intent of this document is to outline foundational research and resulting rationale for the development of the Latent Capacity Analysis decision tool. This is accomplished initially with a discussion of the nature of latent capacity and the I-80 corridors. The discussion then moves to the desire for a risk management framework or the decision tool. Within this risk management framework, the specific components of the latent capacity analysis are detailed including the theoretical basis for them. This discussion involves the application of various theories within the latent capacity analysis decision tool framework. This document closes with some concluding thoughts and a listing of all the references employed in this I-80 corridor latent capacity analysis.

This memo provides a review of the theoretical underpinnings and rationale for the different components of the overall methodology for this latent capacity analysis. The analysis brings together several fields of practice with significantly different theoretical orientations. By independently assessing each practices' tools and analytic approaches in this memo, each individual component of the latent capacity analysis remains focused on its own utility. This memo is important for providing the theoretical anchoring for this practical decision tool.

1.1 I-80 Corridor and Latent Capacity

The I-80 Corridor Study covers the corridor from the California state line to the West McCarran Interchange and from the East McCarran Interchange to just east of the Wadsworth Interchange. The corridor currently operates at "free flow" capacity, which means the speed at which operators feel comfortable. This is a situation where the corridor facilities currently have the capacity for additional operators, which is termed "latent capacity." Existing operational conditions within the portions of the I-80 corridor subject to this I-80 Corridor Study currently operate acceptably without congestion. However, as identified by the Nevada Department of Transportation (NDOT) and the Federal Highway Administration (FHWA), land uses planned by local jurisdictions threaten degradation of this condition. Additional capacity within the transportation infrastructure to accommodate additional trips currently exists.

Having latent, not yet used, infrastructure capacity is an attribute of public goods. In terms of supply and demand, providing for the supply side is a discrete and incremental process while the demand side can grow unfettered because of free entry into the market. Once the public good, Interstate 80, is provided, benefits cannot "be withheld from those who do not pay and are shared

by large groups of consumers" (Hyman, 1999, p. 134). An Interstate highway is a pure public good in that once produced by a single community member it is available for consumption by the entire community (Hyman, 1999). This consumption characteristic as "not yet used infrastructure capacity" for pure public goods provides the rational catalyst for an uncertainty-based analytic approach. This approach provides an answer for the question "when will the unused capacity of this public good be used up?"

1.2 Latent Capacity as Decision Tool

The I-80 Corridor Latent Capacity Analysis Study addresses concerns related to the need for improving transportation along this corridor by evaluating future land use demands while protecting and using existing resources. To maintain the functionality of I-80 it is important to identify the incremental improvements needed due to proposed development along the I-80 Corridor. To assist in this objective the expected number of trips for 2, 7, 15 and horizon 25 years will be estimated based on the Washoe County Regional Transportation Commission's 2040 Regional Model by using an uncertainty based approach.

2 Latent Capacity Decision Analysis

It is important to understand the broader framework in which many of the items discussed in this memo fit. This section discusses that framework initially and then turns to the specific structure of the latent capacity methodology. This provides NDOT with the broad understanding of how the results of the latent capacity analysis for the I-80 corridor can be used as a risk based decision tool now and as the planning process continues into the future. Operationalizing the risk management framework for potential future mitigation efforts allows NDOT to make this part of the planning process into an ongoing project development process to be used at regular intervals.

2.1 Risk Assessment and Management Frameworks

The development of the decision tool, latent capacity analysis, draws on the theory of risk assessment and management. This theory and relevant practices attempts improved decision-making by identifying and quantifying risks or uncertainties about existing and future conditions. Martin and Chadbourne (2004) and Garby (2009) identify broad steps or phases in the risk assessment management process. Each of these is briefly detailed.

Problem identification-definition: The initial phase of the process begins with a general perception of a problem with a significant amount of uncertainty with regard to outcomes. For the I-80 corridor study, this initial insight can be traced to the origins for the corridor study itself. NDOT and FHWA officials sensed that ongoing events along the I-80 corridor had the potential for deteriorating the functionality of the interstate system. While the interstate system currently remains intact, concerns were evident. This insight served as the catalyst for developing a detailed latent capacity analysis decision tool.

Risk identification-assessment: This is the planning phase of risk management assessment. During this phase, a framework for identifying risks, developing probabilities about risks, and

establishing a monitoring framework for risks is undertaken. This phase translates to the development of the latent capacity analysis framework that is undertaken within the I-80 corridor study. Further, a description of this phase constitutes the bulk of this memo and the other memos documenting the decision tool development.

Risk monitoring and mitigation: This phase of risk assessment management monitors the established risks for determining when predetermined mitigations require action. This monitoring/action phase assesses the validity of initial risk probability assignments as future events reveal them. As implementation strategies are engaged, the original decision tool, latent capacity analysis, is updated with the new information. The decision tool continues functioning with feedback as a critical component of planning, operations, and maintenance.

Here a distinction arises between risk assessment and risk management. Risk assessment is typically identified at the project level while risk management is at the program level. These distinctions vary on a risk models and frameworks used by practitioners. Considering the I-80 corridor and its mobility function, the latent capacity analysis decision tool is risk management oriented even though it identifies projects.

2.2 Latent Capacity Methodology

There are three distinct components that interplay in this methodology for the latent capacity assessment. These are:

Baseline and Background: an assessment of current operational conditions based on existing characteristics and an estimation of future conditions less corridor planned development.

Improvements: multiple series of progressive improvements to the transportation infrastructure incrementally improving the different components (ramp terminals, interchanges, transit, etc)

Consumption Timeframe: an uncertainty estimation of how the ultimate consumption of transportation infrastructure occurs moving forward.

As Figure 1 illustrates, these three distinct components of the analysis methodology are brought together for assessing latent capacity. This assessment included the stepwise application of prescribed improvements that restore operational functionality to the transportation infrastructure. This assessment of latent capacity and infrastructure improvements is performed for 2, 7, 15, and 25 rolling horizons. Figure 1 illustrates the component relationships.

The Latent Capacity component focuses on operational and service thresholds and identifying progressive Improvement Options that restore latent capacity to the transportation infrastructure. As the two-way arrow in Figure 1 indicates, this is an iterative analysis process, using analysis software.

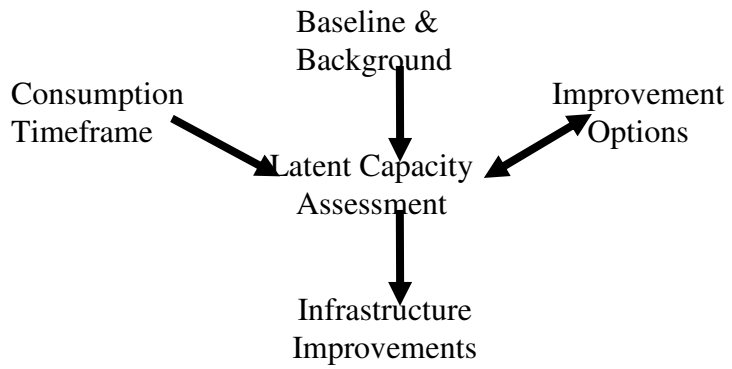


Figure 1. Latent Capacity Analysis Components and Relationships

Each analysis component is developed independently. Once all the components are complete, the Timeline component is overlaid on the Latent Capacity component which utilizes options form the Infrastructure Improvements component to determine feasible improvements along the corridor.

Each of the three distinct components, when applied to the latent capacity assessment, produces the analysis of corridor Infrastructure Improvements and is discussed further in Section3.2.

3 Latent Capacity Analysis Component Details

Each component in the latent capacity analysis portion of the risk management framework relies on different theoretical domains. This section of the memo details the information researched and brought together for each component of the latent capacity analysis. Each element detailed provides information and an explanation on how the information is used in the latent capacity analysis for the I-80 corridor.

3.1 Baseline and Background

The methods and techniques for establishing baseline and background conditions focus on using historical information for projecting into the future. The central task in establishing baseline and background conditions is the estimation of trips that the transportation infrastructure and travel demand measures needs to accommodate. Equally important is establishing the relationships between the different variables and factors in the baseline estimation that carry forth in the estimation of future background conditions. The principle guide for this effort is the National Cooperative Highway Research Program's Report 255, Highway Traffic Data for Urbanized Area Project Planning and Design.

The baseline and background conditions focus on the surroundings beyond the immediate corridor; externals. These corridor external locations are;

- Nevada/California Stateline,

- West of US 395,
- East of Pyramid Highway,
- East of Vista Boulevard,
- East of USA Parkway, and
- West of Lockwood interchanges.

The data at these locations consists of AADT counts collected over the past 30 years. The combinations of these locations provide the capacity for assessing origin and destination patterns such as:

- Interstate traffic
- Interstate-Urban traffic
- Wadsworth-Fernley Traffic
- USA Parkway traffic

The 30 years of data for each location undergoes extensive statistical modeling in order to determine the best fit for projecting future conditions for the 2, 7, 15, and 25 future horizon years. The statistical modeling is accomplished with SPSS software package which provides extensive tests for assessing model fit and validity. Evaluating freeway traffic operation for baseline and background conditions is accomplished with the FREQ12 macroscopic model.

3.2 Improvement Options

The magnitude and sequence of improvement options is dependent on how and where the latent capacity is consumed. This variability in the potential application of improvement options requires broad experience and understanding operational characteristics of transportation facilities and travel demand management techniques.

Improvement options may be categorized into two broad approaches: physical improvement solutions and travel demand management solutions. These two approaches demonstrate the supply and demand dimensions of public goods. Potential physical improvement solutions include but are not limited to: basic freeway sections, interchange areas, new interchanges, or grade separation. The range of physical improvements for these infrastructure elements includes ramp terminal intersection control modification to freeway restriping to widening a freeway ramp or adding a freeway lane. Potential travel demand management solutions may include but are not limited to; access management, ramp metering; transit and rideshare programs, or incident detections and management.

In order to integrate the Improvement Options effectively into the Latent Capacity Analysis, each potential treatment needs predetermined operational parameters for selection. This list of selection factors determine the potential incremental improvements along a freeway corridor and are generated using common principles and experience. These selection factors are associated with the safety and operation of the transportation infrastructure. The triggers are derived using the Highway Capacity Manual (HCS), MUTCD, AASHTO and FHWA guideline methodologies, standards, and information contained in pertinent Transportation Research Board

publications. To facilitate complying with Washoe County RTC's guidelines, a Level of Service (LOS) D threshold is identified where possible. The following list of National Cooperative Highway Research (NCHRP) reports provide a sample of resources consulted in generating improvement options.

- Report 599: Default values for highway capacity and level of service analysis (NCHRP, 2008)
- Report 574: Guidance for cost estimation and management for highway projects during planning, programming, and preconstruction (NCHRP, 2007).
- Report 586: Rail freight solutions to roadway congestion – final report and guidebook (NCHRP, 2007)
- Synthesis 356: Pavement markings – design and typical layout details (NCHRP, 2006)
- Report 548: A guidebook for including access management in transportation planning (NCHRP, 2005)
- Synthesis 329: Integrating tourism and recreation travel with transportation planning and project delivery (NCHRP, 2004)
- Synthesis 340: Convertible roadways and lanes (NCHRP, 2004)
- Synthesis 316: Design exceptions practices (NCHRP, 2003)
- Synthesis 398: Truck trip generation data (NCHRP, 2001)
- Victoria Transport Policy Institute Travel Demand Management at http://www.vtpi.org/tdm/

3.3 Consumption Timeframe

This component of the latent capacity analysis generates the timing of preferred improvement options while incorporating uncertainty. Uncertainty and its counterpart, risk, are invaluable decision tools. The numerous interactions of elements occurring within the I-80 Corridor are interrelated and continuously shifting. Incorporating risk, in regard to the consumption of latent capacity, provides the means for effectively incorporating these complexities within the corridor for decision making. Von Winterfeldt and Edwards (2007) establish that incorporating risk into structuring decision analysis is a three-step process: "identifying the problem", "select an analytic approach", and "develop a detailed analysis approach" (pp. 82-83). Further, it is often appropriate to "combine approaches". This discussion focuses on these steps developed for the latent capacity analysis within the risk management framework.

3.3.1 Identifying the Problem

The I-80 Corridor is a complex union of interrelated components. Complete understanding of what will happen in the future in regards of consuming the facilities latent capacity is difficult and even subjective. As Morgan and Henrion explain (1990), "[t]he subjective, or Bayesian, probability states the probability of an event is the degree of belief that a person has that it will occur, given all the relevant information currently known to that person" p. 49). Gaining insight into available information for establishing a probabilistic approach is achieved through the development of an influence diagram. Influence diagrams begin as qualitative graphical representations of influencing factors and variables arranged to represent informational and time-dependent dimensions. As Bedford and Cooke (2001) note, "the influence diagram is quantified"

with "conditional probability distributions" generated "using some form of expert judgment" (p. 290). This concept of establishing the factors and relationships with an influence diagram and assessing with expert judgment is the foundation for identifying the problem and developing an analysis approach. This is further developed in subsequent sections. An initial discussion of how the probabilistic approach is integrated into estimating trips follows.

The Consumption Timeframe component assembles the variables affecting latent capacity consumption and establishes a timeline for deploying improvement options. An uncertainty-based approach is used to estimate development probabilities along the corridor, based on compilation of individuals' knowledge/perception of influencing factors for predicting horizon years. These development probabilities are then applied to trips established in the Washoe County Regional Transportation Commission's 2040 Regional Model.

3.3.2 Analytic Approach

The fundamental challenge in assessing latent capacity is that the interrelated factors influencing perception often shift in relation to one another. Figure 2 provides a visualization representing the perceived relationships for the I-80 corridor; an influence diagram.

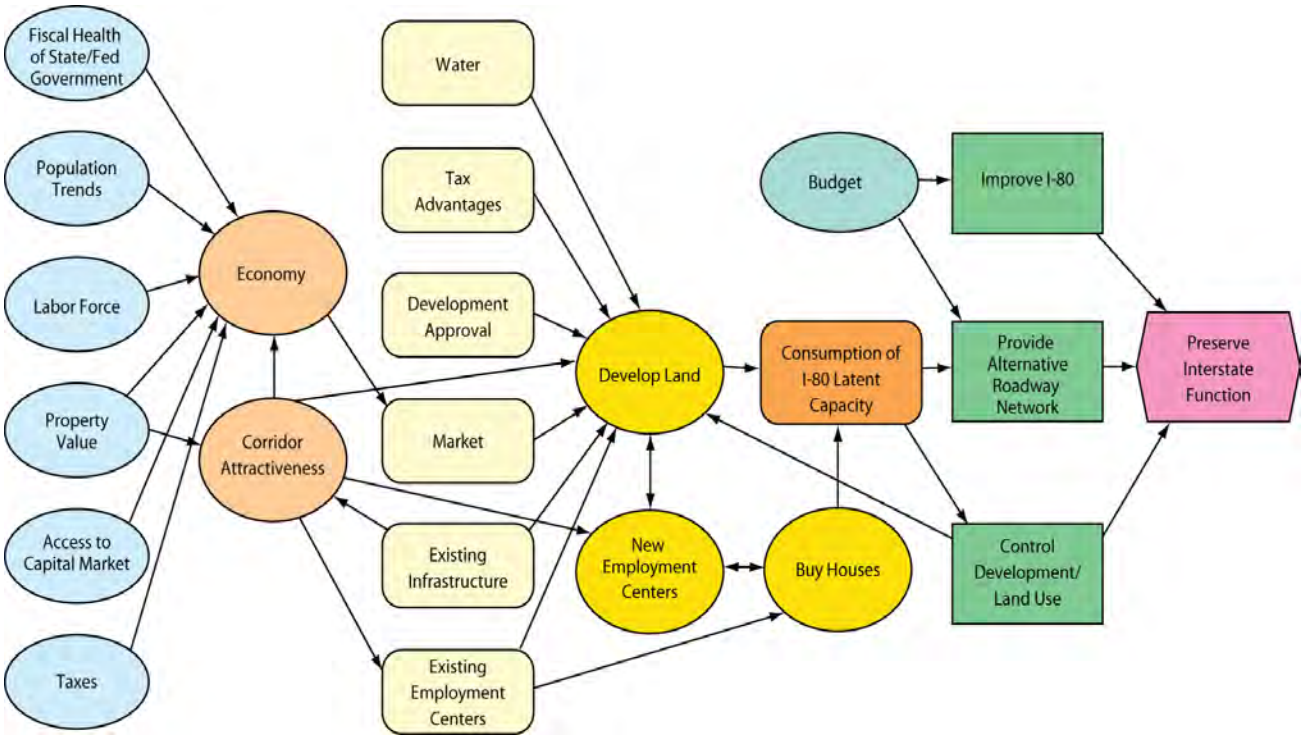


Figure 2. Influence Diagram

The actors, relationships, and individual interests are all dynamic and subject to both external and internal influences. These dynamics are beyond the capacity of an algebraic approach. The complex interrelation of these elements is more comprehensively captured and conveyed by assessing the probability of the various relationships and events. As Hora (2007) notes, multiple

variables often have relationships that make them "probabilistically dependent". "Capturing dependencies in probability assessments can be a daunting task" and "[i]nfluence diagrams can provide a mechanism for organizing this effort" (p. 137). Therefore, a risk/uncertainty approach in determining the consumption of latent capacity within the I-80 corridor is operationalize by distributing trips established in the Washoe County Regional Transportation Commission's 2040 Regional Travel Demand Model based on the dynamics described in the influence diagram.

3.3.3 Expert Opinion Methodology

The uncertainty-based Consumption Timeframe in this methodology is established through expert opinion, a widely used technique for probabilistic risk and decision analysis (Bedford & Cooke, 2001; Edwards, Miles, & von Wintergeldt, 2007; Morgan & Henrion, 1990). Simply, industry experts are asked about the nature of future events, taking into account risk and uncertainty, which has a long tradition in planning and development (Byrne, 1996). As Bedford and Cooke (2001) identify, "expert judgment techniques have been used to estimate model parameter uncertainties" (p. 191). Hora (2007) notes "[i]n order that the judgments of these experts be integrated with other types of information in the decision analysis, they should be codified as probabilities" (p. 128). Further, individual experts have biases such as *representativeness* – associating target events with similar events through clues – and *availability* – "the ability to access or recall information" (Hora, 2007, pp. 141-143). Seeking probabilities from multiple diverse experts has the affect of canceling individual biases in the aggregate distribution of probabilities. A diversity of experts is statistically beneficial. Further, having experts perform the same judgment about uncertainty, it is advisable "to select experts with differing backgrounds, responsibilities, fields of study, etc., so as to gain an appreciation of the differences among beliefs" (Hora, 2007, p. 147).

Capturing expert opinion relies on a research technique developed by the RAND Corporation. The technique assesses expert opinion through a series of independent polling surveys. Each polling survey is anonymous to other experts. Between each survey, polling information is exchanged allowing experts to influence the opinions of the other experts. The fundamental aim is for the experts to reach a reasonable consensus view of the issues in question (Glotz & Bertschi, 2006; Gordon, 1994; Linstone, Turoff, & Helmer, 2002; Sackman, 1974). The traditional procedure surveys the experts through a series of written questions, which are collected, compiled, analyzed for consensus, reformatted, and returned to the experts in paper form for the next round of questions. This procedure is repeated until a acceptable consensus is reached. Further refinements to RAND Corporation's Delphi technique include the sampling of experts for generating statistical analysis of the experts' opinions including opinion distribution (Glotz & Bertschi, 2006; Linstone, Turoff, & Helmer, 2002).

The Delphi method was tailored for this project by concentrating the opinion-gathering into a one-day workshop involving electronic polling of gathered experts and immediate feedback of the aggregated opinion distribution. The workshop included breakout sessions allowing for detailed discussion and information exchange. The discussions used the Influence Diagram for assessing development and for providing insight into a series of various potential components of land development. For the I-80 Corridor Latent Capacity methodology, a broad-based group of experts were engaged focusing on the dynamic attributes of the influence diagram.

A group of experts representing multiple interests and governmental organizations and stakeholders were convened into a workshop with the purpose of exchanging information and making an informed judgment regarding the rate of development within the corridor area.

These characteristics of the Delphi method, successive polling and opinion distribution, made the technique invaluable for establishing the I-80 Latent Capacity Analysis Consumption Timeline. The traditional paper-based methodology was refined to employ electronic polling of gathered experts with immediate feedback in a son-day workshop format. The aggregated expert opinion distributions were captured in electronic polling techniques. These adaptations to RAND Corporation's Delphi technique remain grounded in the fundamental principles of the technique: independent anonymous expert opinions, consensus focused, and open to information exchange.

3.3.4 Backgrounder

In order for the experts to have the information necessary for generating an opinion a comprehensive document was prepared As Hora (2007) recognizes "The process of expressing one's knowledge in terms of probabilities is not simple" (p. 141). Further, eliciting expert opinions requires "framing the issue" which "is creating an unbiased presentation which is free of preconceived notions" (Hora, 2007, p. 146). The backgrounder provided this frame.

Workshop preparation included a detailed review of this backgrounder document, which is organized by north and south interchange "service sheds" (influence areas). Factors such as land use, development attractiveness, and physical and environmental constraints are compiled into a series of map graphics, which also include a qualitative assessment of the factors by experts on the project support team. Workshop attendees were asked a series of questions. Attendee responses, via anonymous electronic polling, included the qualitative assessments provided in this backgrounder and each attendee's expertise and independent judgment.

3.4 Latent Capacity Assessment Process

The comprehensive latent capacity assessment is a process that brings all the standalone components, background baseline, improvement options, and consumption timeframe, together into performing the analysis. The iterative nature of applying improvement options toward identified operational issues necessitates that this process be stepwise. This process is similar to often used hill climbing techniques in computer software which provides a solution, assesses the results, adjusts, and repeats until an optimal result emerges. This section describes how the process is undertaken and the decision tools used.

The analysis begins with two distinct focuses; operations on the mainline freeway and operations at the terminal intersection of the interchanges. These assessment focus components are distinguished by operational characteristics. Mainline freeway operations are free flow with driver behavior and operational characteristics driven by this line are up to trump. Conversely, the terminal intersection's represent interrupted flow with operational characteristics and driver

behavior representative of this condition. The assessment of each situation, free flow and interrupted flow, requires different approaches.

The free flow operations of I-80 are assessed using macroscopic simulation software entitled FREEQ12. This simulation requires inputs representing the geometric and operational conditions of the East and West sections of the I-80 corridor. Sections include all interchange merge and diverge locations in order to simulate their collective interactions. Assessing all the interactions assures that the simulation comprehensively identifies the system deficiencies.

The interrupted flow operations of the ramp terminal intersections starts at a qualitative level and draws in quantitative assessments at operations thresholds. The qualitative assessment begins with a detailed review of existing operational characteristics captured in a detailed table for each interchange terminal intersection for eastbound and westbound direction. Characteristics detailed include intersection right away control, accessibility, safety attributes, trip magnitude and direction, and network connectivity. A series of notes about each of these characteristics is compiled, assessed, and designated into a single value judgment of quality. As future conditions change, the intersection operational elements are reassessed. As these values reach a performance threshold a detailed quantitative analysis is performed and appropriate mitigation is identified and deployed, and a reassessment conducted.

3.5 Future Improvements

The result of iterative latent capacity analysis results in mitigation recommendations. These mitigations are compiled during the iterative process. The potential projects or strategies are organized for both project and programmatic purposes. This allows NDOT the ability to program projects and programs while identifying potential funding sources.

4 Summary and Conclusion

This memo details the background information and rationale for assessing future operations along the I-80 Corridor. This assessment is accomplished from the perspective of consumption of yet unused freeway capacity. Additionally, this memo serves as a companion document for all the other products developed in the latent capacity analysis. As such, it provides a comprehensive overview as well as specific details for each aspect of the analysis.

To summarize, the latent capacity analysis methodology provides the risk assessment component of a larger risk management approach to the consumption of latent capacity along the I-80 Corridor. By performing similar iterative analyses in the future, as information becomes available, NDOT will be able to refine probability distributions and improve the analysis model. While specific details of how the latent capacity analysis is initially performed are likely to change, the overall risk management and analysis methodology provide the rigor necessary for this decision analysis tool.

References

American Association of State Highway and Transportation Officials, (2001). A Policy on Geometric Design of Highways and Streets. Washington DC.

Bared, J. (1999). Safety evaluation of acceleration and deceleration lane lengths, ITE Journal, May.

Bedford, T. & Cooke, R. (2001). Probabilistic risk Analysis: Foundations and methods. New York: Cambridge University Press.

Buede, D. M. (2005). Influence diagrams: A practitioner's perspectives Decision Analysis, 2(4), pp. 235-237.

Byrne, P. (1996). Risk, uncertainty, and decision-making in property development, (2nd Ed.). New York: Taylor & Francis.

Center for Transportation Research, (2000). Reevaluation of ramp design speed criteria, Austin, Texas; The University of Texas.

Detwarasiti, A. & Shachter, R. D (2005). Influence diagrams for team decision analysis. Decision Analysis, 2(4), pp. 207-228.

Edwards, W., Miles, R. F., & von Wintergeldt, D. (2007). Advances in decision analysis: From fundamentals to applications. New York: Cambridge University Press.

Federal Highway Administration, (2007). *Highway Performance Monitoring System Field manual*. Washington, DC.

Garvey P. R. (2009). *Analytical methods for risk management: A systems engineering perspective*. New York CRC Press Taylor & Francis Group.

Glotz P. & Bertschi, S. (2006;). People, Mobiles, and society: Concluding insights from an international expert survey. Knowledge, Technology, & Policy, 19(2), pp. 69-92.

Gordon, T. J. (1994). The Delphi method. http://www.gerenciamento.ufba.br/Downloads/delphi%20(1).pdf

Hora, S. C. (2007). Eliciting probabilities from experts. In W. Edwards, R. F. Miles, Jr., & D. von Winterfeldt (Eds). *Advances in Decision Analysis: From Foundations to Applications* (pp. 129-153). New York, Cambridge University Press.

Hyman, D. N., (1999). Public finance: A contemporary application of theory to policy, (6th Ed.). The Dryden Press.

Institute of Transportation Studies, (2009). *University of California at Berkeley*, http://www.its.berkeley.edu/research/freq.html last accessed on January 14, 2009.

Lawson, T., Lin, W. H. and Cassidy. M. (1999). Validation of the incremental transfer model PATH working paper UCB-ITS-PWP-99-16, Inst. Trans. Studies, Univ. of California, Berkeley, CA,

Linstone, H. A., Turoff, M., & Helmer, O. (2002). The Delphi method: Applications and Techniques. Available on the World Wide Web at http://is.njit.edu/pubs/delphibook/delphibook.pdf

Lee, E. B., Kim, C., & Harvey, J. T. (2005). *Application of Macro- and Microscopic Simulations for the Traffic Planning of Urban Highway Reconstruction,* Transportation Research Board 84th Annual Meeting January 9-13, Washington, D.C.

May, A. & Leiman, L. (2005). *Freeway Analysis Manual*, Institute of Transportation Studies, University of California at Berkeley. Sponsored by, Caltrans/UCB PATH Program, California Department of Transportation.

May, A. & Leiman, L. (2005). *Freeway Analysis Manual,* Institute of Transportation Studies, University of California at Berkeley.

Morgan, M. G. & Henrion, M. (1990). Uncertainty: A guide to dealing with uncertainty in quantitative risk and policy analysis. New York: Cambridge University Press.

Munoz, J.C., & Daganzo, C. F., (2000). Experimental Characterization of Multi-Lane Freeway Traffic Upstream Of an Off-Ramp Bottleneck, Inst. Trans. Studies, Univ. of California, Berkeley, CA,

Munoz, J.C., & Daganzo, C. F., (2000) The Bottleneck Mechanism of a Freeway Diverge, Berkeley, CA. Institute Transportation Studies, Univ. of California, Berkeley.

National Cooperative Highway Research Program (2008). Report 599: Default values for highway capacity and level of service analysis. Washington, D.C.: Transportation Research Board of the National Academies.

National Cooperative Highway Research Program (2007). Report 574: Guidance for cost estimation and management for highway projects during planning, programming, and preconstruction. Washington, D.C.: Transportation Research Board of the National Academies.

National Cooperative Highway Research Program (2007). Report 586: Rail freight solutions to roadway congestion – final report and guidebook. Washington, D.C.: Transportation Research Board of the National Academies.

National Cooperative Highway Research Program (2006). Synthesis 356: Pavement markings – design and typical layout details. Washington, D.C.: Transportation Research Board of the National Academies.

National Cooperative Highway Research Program (2005). Report 548: A guidebook for including access management in transportation planning. Washington, D.C.: Transportation Research Board of the National Academies.

National Cooperative Highway Research Program (2004). Synthesis 329: Integrating tourism and recreation travel with transportation planning and project delivery. Washington, D.C.: Transportation Research Board of the National Academies.

National Cooperative Highway Research Program (2004). Synthesis 340: Convertible roadways and lanes. Washington, D.C.: Transportation Research Board of the National Academies.

National Cooperative Highway Research Program (2003). Synthesis 316: Design exceptions practices. Washington, D.C.: Transportation Research Board of the National Academies.

National Cooperative Highway Research Program (2001). Synthesis 398: Truck trip generation data. Washington, D.C.: Transportation Research Board of the National Academies.

National Cooperative Highway Research Program, (1982). Report 255, Highway Traffic Data for Urbanized Area Project Planning and Design. Washington, D.C.: Transportation Research Board of the National Academies..

Pearl, J. (2005). Influence diagrams: Historical and personal perspectives. Decision Analysis, 2(4), pp. 232-234.

Nevada Department of Transportation, (1999). Access Management System and Standards,

Sackman, H. (1974). Delphi assessment: Expert opinion, forecasting, and group process. Available on the World Wide Web at http://www.rand.org/pubs/reports/2006/R1283.pdf

Torres, L. (2005). Service charters: Reshaping trust in government: The case of Spaim. Decision Analysis, 2(4), pp. 232-234.

Transportation Research Board (2007). Transportation research circular E-C110: Geometric design strategic research. Washington, D.C.: Transportation Research Board of the National Academies.

Von Winterfeldt, D. & Edwards, W. (2007). Defining a decision analysis structure. In W. Edwards, R. F. Miles, Jr., & D. von Winterfeldt (Eds). *Advances in Decision Analysis: From Foundations to Applications* (pp. 81-103). New York, Cambridge University Press.

Transportation Research Board, (2000). Highway Capacity Manual 2000, National Research Council, Washington, D.C.

U.S. Department of Transportation, Federal Highway Administration, Publication No. FHWA-RD-00-067, Roundabouts: An Informational Guide, June 2000

Victoria Transport Policy Institute, (2009). Congestion Reduction Strategies, www.vtpi.org , last visited January 23, 2009.

Yagar, S. & Hui, R. (2004). System Wide Analysis of Freeway Improvements, Transportation Research Record 1554. Washington DC.

APPENDIX 1-A

MINGUS MTN
PINE GROVE
MASON
EDGEWOOD
LAKE MONTEZUMA
CLARKDALE
JEROME
COTTONWOOD
CAMP VERDE
CLEMENCEAU
CAMP VERDE
CLARKDALE
JEROME
COTTONWOOD

Table 1: I-80 West Corridor Eastbound

Segment	Location	Distance Feet	Grade	Mainline Lanes	Ramp Lanes	AADT		
						Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	2640	-2.5%	2	1	799		29100
2	West Verdi Off	2100	-2.5%	2				
3	West Verdi On	1740	-2.5%	2	1		1132	29641
4	West Verdi On Cont.	2960	-2.7%	2				
5	Verdi On	5100	-2.2%	2	1	743	277	29913
6	Garson Off	2920	-2.2%	2				
7	Garson On	4350	-1.0%	2	1		2120	
8	East Verdi On Acceleration	680	-1.9%	3	1		1877	36931
9	East Verdi On	880	-1.9%	2	1	254		
10	Mogul Off	1740	-2.8%	2				
11	Mogul On Acceleration	450	-0.3%	3	1		1299	38801
12	Mogul On	1600	-0.3%	2	1	1257		
13	West 4th Off	6980	2.7%	2	1	1341		
14	Robb Drive Off	1500	1.2%	2				
15	Robb Drive On Acceleration	4000	-2.3%	4	2		10752	49155
16	Rob Drive On Cont	1200	-0.1%	3	1	4830		
17	West McCarran Off	4470	-0.1%	2				
18	West McCarran On	2640	-0.1%	2	1		13585	66773

LEGEND

Number 2006 AADT
AADT Annual Average Daily Traffic

Table 2: I-80 West Corridor Westbound

Segment	Location	Distance Feet	Grade	Mainline Lanes	Ramp Lanes	AADT		
						Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	2500	-1.0%	4	2	15096		66773
2	West McCarran Off	4490	-1.0%	3				
3	West McCarran On	4300	-1.0%	3	1		4912	49155
4	Robb Drive Off	3300	3.0%	3				
5	Robb Drive On, Acceleration	430	1.0%	3	1		1760	
6	Robb Drive On cont	7200	-3.0%	2				
7	West 4th Street On, Acceleration	440	-0.5%	3	1		1245	
8	West 4th Street On cont	890	-0.5%	2	1	1222		38801
9	Exit 7, Mogul Off Ramp	700	2.5%	2				
10	Mogul On, Acceleration	160	2.5%	3	1		259	36931
11	Mogul On cont	6840	1.3%	2	1	1821		
12	Exit 5, East Verdi Off Ramp	5350	3.3%	2	1	2742		
13	Exit 4, Garson Off Ramp	1480	1.0%	2				
14	Garson On, Acceleration	765	1.4%	3	1		1270	
15	Garson On cont	4100	1.4%	2	1	296		29913
16	Exit 3, Verdi Off Ramp	5430	0.0%	2	1	2690		29641
17	Exit 2, West Verdi Off	2590	1.5%	2	1	49		
18	Exit 1, West Verdi Off	1150	1.5%	2				
19	West Verdi On Ramp	2500	1.5%	2	1		2060	29100

LEGEND

Number 2006 AADT
AADT Annual Average Daily Traffic

Table 3: I-80 East Corridor Eastbound

Segment	Location	Distance Feet	Grade	Mainline Lanes	Ramp Lanes	AADT		
						Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	2640	0.0%	2	1	11030		79583
2	E.McCarran Off Ramp	2540	0.0%	2				
3	E.McCarran On Ramp	3720	0.0%	2	1	10125	4040	
4	Sparks Off Ramp	2000	0.0%	2				45715
5	Sparks On Ramp	1500	0.0%	2	1	9965	1454	
6	Vista Off Ramp	2200	0.0%	2				
7	Vista On Ramp	3600	-1.5%	2	1		3632	
8	Vista On Ramp Cont	9304	0.0%	2	1	1670		
9	Lockwood Off Ramp	1800	0.0%	2				
10	Lockwood On Ramp	5460	1.0%	2	1	1285	181	31351
11	Mustang Off Ramp	3069	-1.3%	2				
12	Mustang On Ramp	13300	-1.0%	2	1		461	33787
13	Mustang On Ramp Cont.	5280	1.5%	2				
14	Mustang On Ramp Cont.	4180	-2.0%	2	1	1084		
15	Patrick Off Ramp	2680	-2.0%	2				
16	Patrick On Ramp	8960	0.0%	2	1		196	31990
17	Patrick On Ramp Cont.	4440	-1.0%	2	1	1297		
18	Tracey Off	2780	0.0%	2				
19	Tracey On	1584	-1.0%	2	1		504	26334
20	USA Parkway Off Ramp	2220	-1.0%	2				
21	USA Parkway On Ramp	10560	0.0%	2				
22	USA Parkway On Ramp Cont.	8976	-1.0%	2	1	86		
23	Derby Off Ramp	2020	0.0%	2				
24	Derby On Ramp	8980	0.0%	2	1	19	58	29990
25	Orchard Off Ramp	1750	-1.0%	2				
26	Orchard On Ramp	4320	-1.0%	2	1	53	19	25620
27	Painted Rock Off Ramp	1800	-1.0%	2				
28	Painted Rock On Ramp	17610	-1.0%	2	1	531	48	25631
29	Wadsworth Off Ramp	2640	-1.0%	2				
30	Wadsworth On Ramp	2640	-1.0%	2	1		213	24928

LEGEND

Number 2006 AADT
AADT Annual Average Daily Traffic

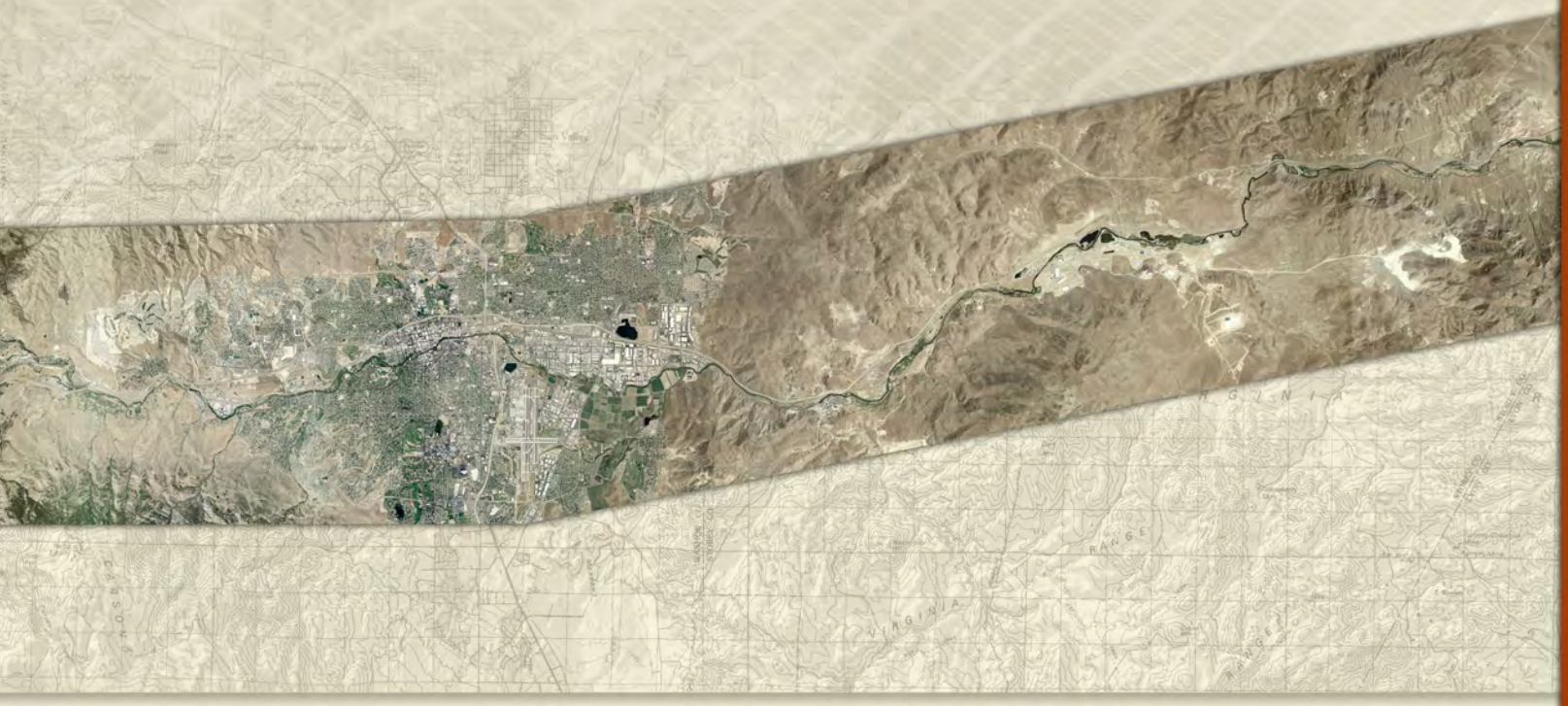
Table 4: I-80 East Corridor Westbound

Segment	Location	Distance Feet	Grade	Mainline Lanes	Ramp Lanes	AADT		
						Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	2640	0.0%	2	1	209		
2	Wadsworth Off Ramp	2290	0.0%	2				
3	Wadsworth On Ramp	17900	1.0%	2	1	44	558	25631
4	Painted Rock Off Ramp	2340	1.0%	2				
5	Painted Rock On Ramp	4340	0.0%	2	1	17	46	25620
6	Orchard Off Ramp	1710	1.0%	2				
7	Orchard On Ramp	8730	0.0%	2	1	43	18	29990
8	Derby Off Ramp	2430	1.0%	2				
9	Derby On Ramp	19800	0.0%	2	1		70	
10	USA Parkway Off Ramp	2800	1.0%	2				
11	USA Parkway On Ramp	2150	0.0%	2	1	499		26334
12	Tracey Clark Off	880	-1.0%	2				
13	Tracey Clark On	11300	0.0%	2	1		1380	31990
14	Tracey Clark On Cont.	8800	1.1%	2	1	177		
15	Patrick Off Ramp	890	1.1%	2				
16	Patrick On Ramp	3060	2.0%	2	1		851	33787
17	Patrick On Ramp Cont.	5280	-1.5%	2				
18	Patrick On Ramp Cont.	12032	1.0%	2	1	255		
19	Mustang Off Ramp	3080	1.0%	2				
20	Mustang On Ramp	6860	0.0%	2	1	166	1108	31351
21	Lockwood Off Ramp	1175	0.0%	2				
22	Lockwood On Ramp	12400	0.0%	2	1	2934	1613	
23	Vista Off Ramp	2250	-1.5%	2				
24	Vista On Ramp	350	-1.0%	3	1		11212	
25	Vista On Ramp Cont	1100	0.0%	2				
26	Vista On Ramp Cont	620	0.0%	3	1	1206		
27	Sparks Off Ramp	3050	1.0%	2				45715
28	Sparks On Ramp	450	0.0%	3	1		10596	
29	Sparks On Ramp Cont.	2640	0.0%	2	1	4282		
30	McCarran Off Ramp	1375	0.0%	2				
31	McCarran On Loop Ramp	350	0.0%	3	1		3785	
32	McCarran On Loop Ramp Cont.	1400	0.0%	2				
33	McCarran On Ramp	2640	0.0%	3	1		8554	79583

LEGEND

Number 2006 AADT
AADT Annual Average Daily Traffic

PROVIDED ELECTRONICALLY ON ENCLOSED CD



APPENDIX 1-B

PROVIDED ELECTRONICALLY ON ENCLOSED CD

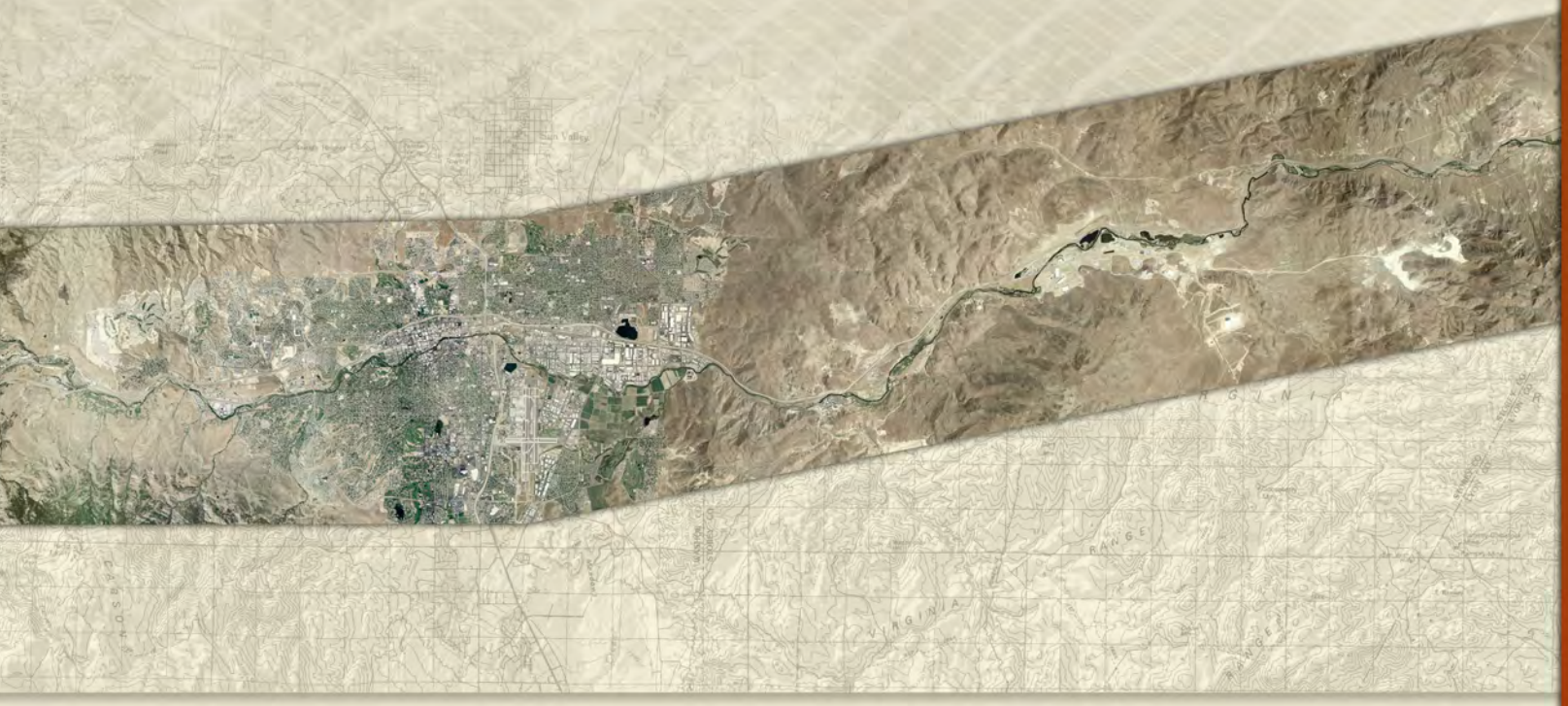
APPENDIX 1-C

PROVIDED ELECTRONICALLY ON ENCLOSED CD

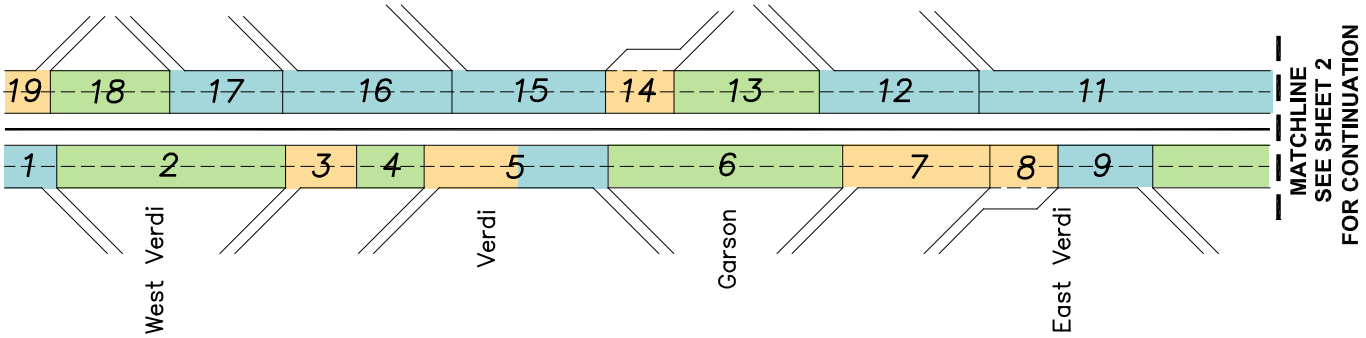
APPENDIX 1-D

APPENDIX 1-E

PROVIDED ELECTRONICALLY ON ENCLOSED CD



I-80 West Corridor Westbound									
Section Number	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**
Length (ft)	2,500	1,150	2,590	5,430	4,100	765	1,480	5,350	6,840
Speed (mph)	65	65	65	65	65	65	65	65	65
AADT (vpd)	29,100			29,641	29,913				
Off Ramp Volume AM(PM) (vph)			10(4)	170(190)	27(30)			170(190)	150(170)
On Ramp Volume AM(PM) (vph)	150(110)					40(75)			
Peak Hour Volume AM(PM) (vph)	910(841)	760(731)	770(735)	940(925)	967(955)	967(955)	927(880)	1,097(1,070)	1,247(1,240)
% Truck	27.8(23.7)	27.8(23.7)	27.8(23.7)	27.8(23.7)	27.8(23.7)	27.8(23.7)	27.8(23.6)	27.8(23.6)	27.8(23.6)



I-80 West Corridor Eastbound									
Section Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Length (ft)	2,640	2,100	1,740	2,960	5,100	2,920	4,350	680	880
Speed (mph)	65	65	65	65	65	65	65	65	65
AADT (vpd)	29,100		29,641		29,913			36,931	
Off Ramp Volume AM(PM) (vph)	28(92)				39(60)				28(40)
On Ramp Volume AM(PM) (vph)			47(88)		24(19)		139(175)	183(236)	
Peak Hour Volume AM(PM) (vph)	478(1,213)	450(1,121)	497(1,209)	497(1,209)	521(1,228)	482(1,168)	621(1,343)	804(1,579)	804(1,579)
% Truck	36.2(20.3)	36.2(20.3)	36.2(20.3)	36.2(20.3)	36.2(20.3)	36.3(20.3)	36.2(20.3)	36.2(20.3)	36.2(20.3)

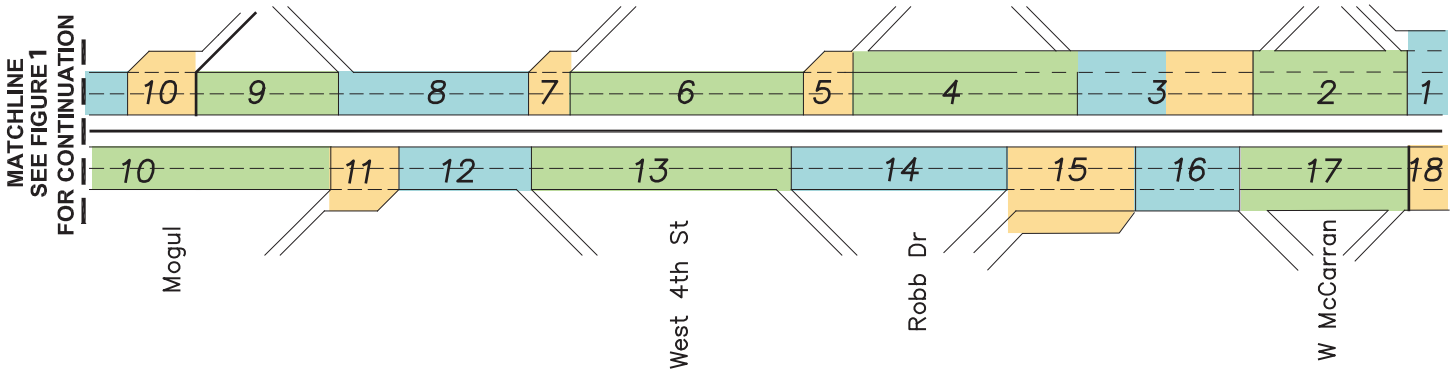
Basic Subsection

On-Ramp Subsection

Off-Ramp Subsection

Baseline Subsection Data Figure 1

I-80 West Corridor Westbound										
Section Number	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Length (ft)	160	700	890	440	7,200	430	3,300	4,300	4,490	2,500
Speed (mph)	65	65	65	65	65	65	65	65	65	65
AADT (vpd)	36,931		38,801					49,155		44,879
Off Ramp Volume AM(PM) (vph)			42(140)	105(130)				511(960)		639(1,338)
On Ramp Volume AM(PM) (vph)	34(15)					153(110)		242(357)		
Peak Hour Volume AM(PM) (vph)	1,247(1,240)	1,213(1,225)	1,255(1,365)	1,255(1,365)	1,150(1,235)	1,150(1,235)	997(1,125)	1,508(2,085)	1,266(1,728)	1,905(3,066)
% Truck	27.8(23.6)	27.9(23.6)	27.9(23.6)	27.9(23.6)	27.9(23.6)	27.9(23.6)	27.9(23.6)	27.9(23.6)	27.9(23.6)	27.8(23.6)



I-80 West Corridor Eastbound									
Section Number	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Length (ft)	1,740	450	1,600	6,980	1,500	4,000	1,200	4,470	2,640
Speed (mph)	65	65	65	65	65	65	65	65	65
AADT (vpd)		28,801				49,155			45,196
Off Ramp Volume AM(PM) (vph)			120(180)	127(194)			316(450)		
On Ramp Volume AM(PM) (vph)		199(84)				1,562(630)			1,258(910)
Peak Hour Volume AM(PM) (vph)	776(1,539)	975(1,623)	975(1,623)	855(1,443)	728(1,249)	2,290(1,879)	2,290(1,879)	1,974(1,429)	1,258(2,339)
% Truck	36.2(20.3)	36.1(20.3)	36.1(20.3)	36.1(20.3)	36.1(20.3)	36.1(20.3)	36.1(20.3)	36.1(20.4)	36.1(20.4)

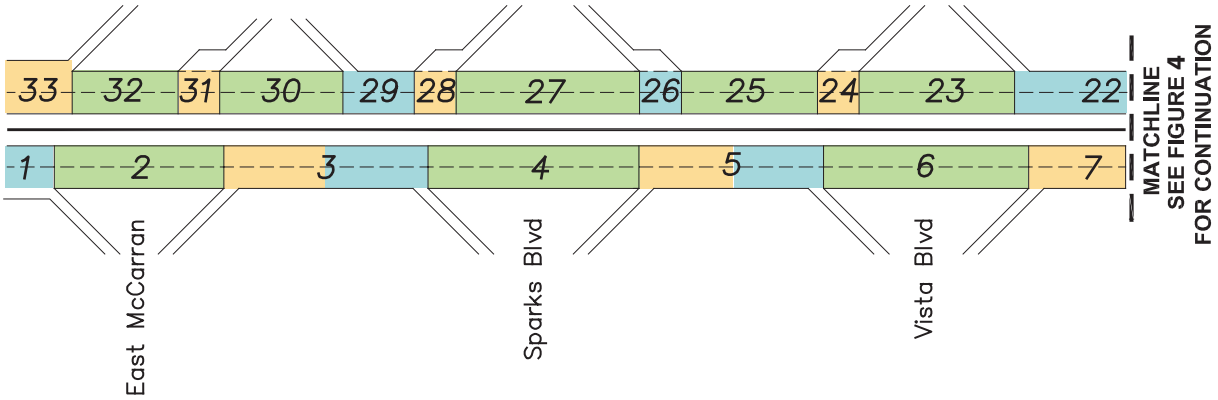
Basic Subsection

On-Ramp Subsection

Off-Ramp Subsection

Baseline Subsection Data Figure 2

I-80 East Corridor Westbound												
Section Number	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**26**	**25**	**24**	**23**	**22**
Length (ft)	2,640	1,400	350	1,375	2,640	450	3,050	620	1,100	350	2,250	12,400
Speed (mph)	65	65	65	65	65	65	65	65	65	65	65	65
AADT (vpd)	79,583						45,715			34,831		
Off Ramp Volume AM(PM) (vph)					333(310)			107(99)				225(210)
On Ramp Volume AM(PM) (vph)	510(540)		460(480)			816(829)				894(910)		105(125)
Peak Hour Volume AM(PM) (vph)	3,683(3,400)	3,173(2,860)	3,173(2,860)	2,972(2,380)	3,392(2,690)	3,392(2,690)	2,212(1,861)	2,362(1,960)	2,362(1,960)	2,362(1,960)	1,312(1,050)	1,586(1,260)
% Truck	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)



I-80 East Corridor Eastbound							
Section Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Length (ft)	2,640	2,540	3,720	2,000	1,500	2,200	3,600
Speed (mph)	65	65	65	65	65	65	65
AADT (vpd)	79,583			45,715			34,831
Off Ramp Volume AM(PM) (vph)	640(882)		690(903)		660(820)		
On Ramp Volume AM(PM) (vph)			230(432)		92(115)		224(450)
Peak Hour Volume AM(PM) (vph)	2,401(3,219)	1,761(2,337)	1,991(2,769)	1,301(1,866)	1,393(1,981)	733(1,161)	957(1,611)
% Truck	8.5(9.7)	8.5(9.7)	8.5(9.7)	8.6(9.6)	8.6(9.6)	8.7(9.6)	8.7(9.6)

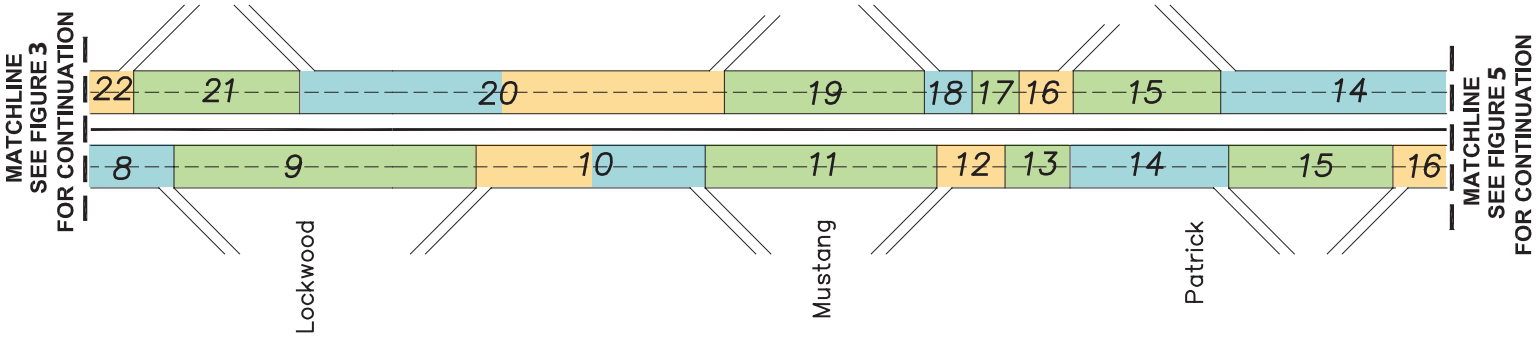
Basic Subsection

On-Ramp Subsection

Off-Ramp Subsection

Baseline Subsection Data Figure 3

I-80 East Corridor Westbound									
Section Number	**22**	**21**	**20**	**19**	**18**	**17**	**16**	**15**	**14**
Length (ft)	12,400	1,175	6,860	3,080	12,032	5,280	3,060	890	8,800
Speed (mph)	65	65	65	65	65	70	70	70	70
AADT (vpd)			31,351				33,787		
Off Ramp Volume AM(PM) (vph)	225(210)		13(13)		20(23)				10(10)
On Ramp Volume AM(PM) (vph)	105(125)		96(96)				124(135)		
Peak Hour Volume AM(PM) (vph)	1,586(1,260)	1,406(1,135)	1,420(1,148)	1,320(1,052)	1,345(1,075)	1,345(1,075)	1,345(1,075)	1,285(940)	1,320(950)
% Truck	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.2(7.3)	7.3(7.3)



I-80 East Corridor Eastbound									
Section Number	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Length (ft)	9,304	1,800	5,460	3,069	13,300	5,280	4,180	2,680	8,960
Speed (mph)	65	65	65	65	65	65	70	70	70
AADT (vpd)			31,351		33,787	33,787	33,787		31,990
Off Ramp Volume AM(PM) (vph)	75(145)		140(100)				170(52)		
On Ramp Volume AM(PM) (vph)			12(20)		34(50)				15(22)
Peak Hour Volume AM(PM) (vph)	957(1,611)	882(1466)	894(1,486)	754(1,386)	788(1,436)	788(1,436)	788(1,436)	618(1,384)	633(1,406)
% Truck	8.7(9.6)	8.7(9.6)	8.7(9.6)	8.8(9.6)	8.8(9.6)	8.8(9.6)	8.8(9.6)	8.9(9.6)	8.8(9.6)

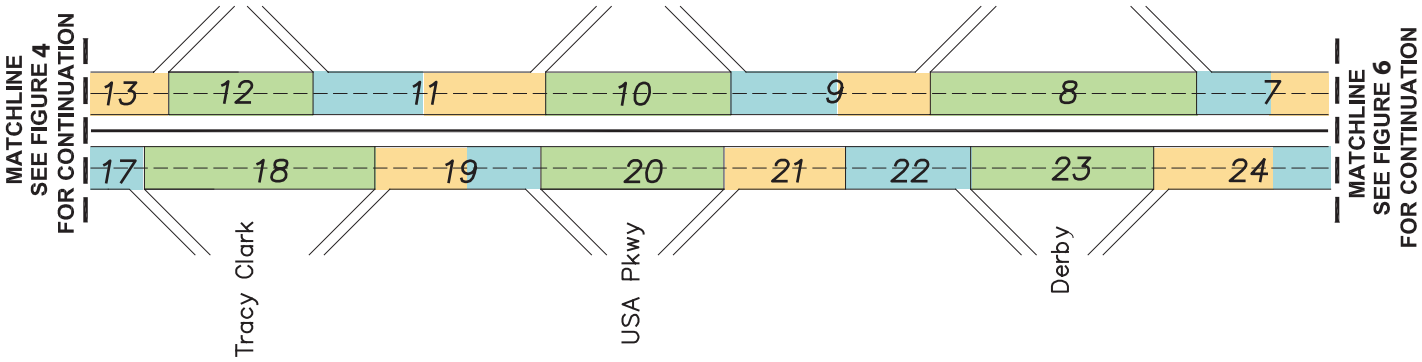
Basic Subsection

On-Ramp Subsection

Off-Ramp Subsection

Baseline Subsection Data Figure 4

I-80 East Corridor Westbound							
Section Number	**13**	**12**	**11**	**10**	**9**	**8**	**7**
Length (ft)	11,300	880	2,150	2,800	19,800	2,430	8,730
Speed (mph)	70	70	70	70	70	70	70
AADT (vpd)	31,990		26,334				29,990
Off Ramp Volume AM(PM) (vph)			14(14)				4(4)
On Ramp Volume AM(PM) (vph)	191(203)				5(15)		1(35)
Peak Hour Volume AM(PM) (vph)	1,320(950)	1,260(747)	1,290(761)	1,290(761)	1,290(761)	1,287(746)	1,291(750)
% Truck	7.3(7.4)	7.3(7.4)	7.3(7.4)	7.3(7.4)	7.3(7.4)	7.3(7.4)	7.3(7.4)



I-80 East Corridor Eastbound								
Section Number	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Length (ft)	4,440	2,780	1,584	2,220	10,560	8,976	2,020	8,980
Speed (mph)	70	70	70	70	70	70	70	70
AADT (vpd)					26,334			29,990
Off Ramp Volume AM(PM) (vph)	118(46)					3(16)		2(20)
On Ramp Volume AM(PM) (vph)			10(80)					1(5)
Peak Hour Volume AM(PM) (vph)	633(1,406)	515(1,360)	525(1,440)	525(1,440)	525(1,440)	525(1,440)	522(1,424)	523(1,429)
% Truck	8.8(9.6)	8.9(9.6)	8.9(9.7)	8.9(9.7)	8.9(9.7)	8.9(9.7)	9.0(9.6)	9.0(9.6)

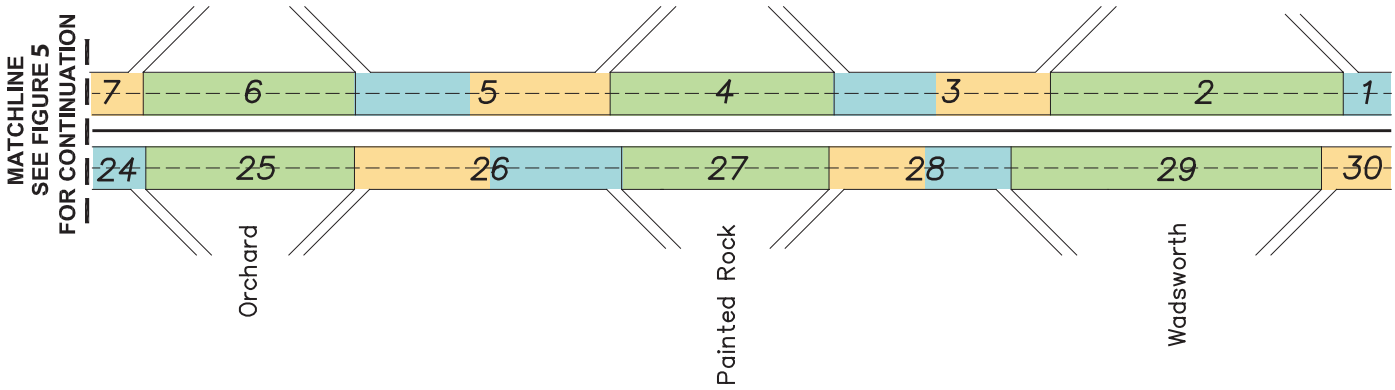
Basic Subsection

On-Ramp Subsection

Off-Ramp Subsection

Baseline Subsection Data Figure 5

I-80 East Corridor Westbound							
Section Number	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Length (ft)	8,730	1,710	4,340	2,340	17,900	2,292	2,640
Speed (mph)	70	70	70	70	70	70	70
AADT (vpd)	29,990		25,620		25,631		
Off Ramp Volume AM(PM) (vph)	4(4)		1(1)		3(3)		13(13)
On Ramp Volume AM(PM) (vph)	1(35)		3(13)		35(30)		
Peak Hour Volume AM(PM) (vph)	1,291(750)	1,290(715)	1,290(716)	1,271(703)	1,273(706)	1,203(676)	1,216(689)
% Truck	7.3(7.3)	7.3(7.3)	7.3(7.3)	7.3(7.3)	7.3(7.2)	7.3(7.2)	7.3(7.3)



I-80 East Corridor Eastbound							
Section Number	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Length (ft)	8,980	1,750	4,320	1,800	17,610	2,640	2,640
Speed (mph)	70	70	70	70	70	70	70
AADT (vpd)	29,990		25,620		25,631		24,928
Off Ramp Volume AM(PM) (vph)	2(20)		7(4)		30(61)		
On Ramp Volume AM(PM) (vph)	1(5)		10(1)		3(10)		12(15)
Peak Hour Volume AM(PM) (vph)	523(1,429)	521(1,409)	531(1,410)	524(1,406)	527(1,416)	497(1,355)	509(1,370)
% Truck	9.0(9.6)	9.0(9.6)	9.0(9.6)	9.0(9.6)	8.9(9.6)	8.9(9.6)	8.8(9.6)

Basic Subsection

On-Ramp Subsection

Off-Ramp Subsection

Baseline Subsection Data Figure 6

MINDEN
GARDNERVILLE
RANCHO
LAMPSON
LARSONS

I-80 West Corridor Eastbound - Table 1

Segment	Location	2007 AM Volumes					2007 AM Balanced volumes				2007 PM Volumes					2007 PM Balanced Volumes			
		Off-Ramp	On-Ramp	Mainline Volume	Seasonal Factor Ramp	Seasonal Factor Mainline	Off-Ramp	On-Ramp	Mainline Vol	% Change from Count	Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Ramp	Seasonal Factor Mainline	Off-Ramp	On-Ramp	Mainline Vol	% Change from Count
1	Beginning Segment	28.00		478	0.821		28		580	21.34%	92		1213			80		1250	3.05%
2	West Verdi Off								552					0.821				1170	
3	West Verdi On		47	646	0.979	0.995		47	599	-7.78%		88	1371		0.995		120	1290	-6.41%
4	West Verdi On Cont.								599									1290	
5	Verdi On	39	24	670	0.967	0.995	39	30	629	-6.62%	53	19	1388	0.979	0.995	53	55	1345	-3.60%
6	Garson Off								590					0.967				1292	
7	Garson On		139		0.892			145	735			183		0.892			200	1492	
8	East Verdi On Acceleration		183	916	0.967	0.995		185	920	-0.07%		259	1883	0.967	0.995		259	1751	-7.51%
9	East Verdi On	12			0.967		28		920		25					25		1751	
10	Mogul Off								892					0.967				1726	
11	Mogul On Acceleration		199	1087	0.983	0.995		200	1092	-0.04%		84	1937	0.983	0.995		110	1836	-5.72%
12	Mogul On	79			0.995		120		1092		154					180		1836	
13	West 4th Off	107		890	0.983		130		972		164		1320	0.995		190		1656	
14	Robb Drive Off								842					0.983				1466	
15	Robb Drive On Acceleration		1562	2123	0.983	0.995		1480	2322	8.87%		655	1811	0.983	0.995		655	2121	16.62%
16	Rob Drive On Cont	316			0.961		350		2322		412					390		2121	
17	West McCarran Off								1972					0.961				1731	
18	West McCarran On		1258	3065				1258	3230	0.29%		929	2339	0.961			950	2681	-4.32%

I-80 West Corridor Westbound - Table 2

Segment	Location	2007 Volumes AM					2007 Balanced Volumes AM				2007 Volumes PM					2007 Balanced Volumes PM			
		Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Ramp	Seasonal Factor Mainline	Off-Ramp	On-Ramp	Mainline Vol	% Change from Count	Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Ramp	Seasonal Factor Mainline	Off-Ramp	On-Ramp	Mainline Vol	% Change from Count
1	Beginning Segment	646		1905			639		1905	0.00%	1338		3066			1338		3066	0.00%
2	West McCarran Off				1.047				1266					1.047				1728	
3	West McCarran On	511	242	1508	0.961	0.995	511	242	1508	0.00%	850	400	2122	0.961	0.995	960	357	2085	-1.74%
4	Robb Drive Off								997									1125	
5	Robb Drive On, Acceleration		153	1150	0.983			153	1150	0.00%		127		0.983			110	1235	
6	Robb Drive On cont								1150									1235	
7	West 4th Street On, Acceleration		106	1255	0.995	0.995		105	1255	0.00%		142	1288	0.995	0.995		130	1365	5.98%
8	West 4th Street On cont	42					42		1255		137					140		1365	
9	Exit 7, Mogul Off Ramp				0.983				1213					0.983				1225	
10	Mogul On, Acceleration		20	1247	0.983	0.995		34	1247	0.00%		15	1179	0.983	0.995		15	1240	5.17%
11	Mogul On cont	142					150		1247		164					170		1240	
12	Exit 5, East Verdi Off Ramp	162			0.967		170		1097		182			0.967		190		1070	
13	Exit 4, Garson Off Ramp				0.967				927					0.967				880	
14	Garson On, Acceleration		44	977	0.995	0.995		40	967	-1.02%		75	950	0.995	0.995		75	955	0.53%
15	Garson On cont	17					27		967		20					30		955	
16	Exit 3, Verdi Off Ramp	158		966	0.983	0.995	170		940	-2.69%	185		930	0.983	0.995	190		925	-0.54%
17	Exit 2, West Verdi Off	5			0.995		10		770		4			0.995		4		735	
18	Exit 1, West Verdi Off				0.995				760					0.995				731	
19	West Verdi On Ramp		171	857	0.995			150	910	6.18%		126	778	0.995			110	841	8.10%

I-80 East Corridor Eastbound - Table 3

Segment	Location	2007 AM					2007 AM Balanced				2007 PM					2007 PM Balanced			
		Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Mainline	Seasonal Factor Ramp	Off-Ramp	On-Ramp	Mainline Vol	% Change from Count	Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Mainline	Seasonal Factor Ramp	Off-Ramp	On-Ramp	Mainline Vol	% Change from Count
1	Beginning Segment	664		2401	1.025		640		2401	0%	882		3219	1.076		882		3219	0%
2	E.McCarran Off Ramp					1.025			1761						1.025			2337	
3	E.McCarran On Ramp	706	193			1.076	690	230	1991		903	417			1.076	903	432	2769	
4	Sparks Off Ramp			1361	1.076	1.076			1301	-4%			1886	1.076	1.076			1866	-1%
5	Sparks On Ramp	660	92			1.18	660	92	1393		808	124			1.18	820	115	1981	
6	Vista Off Ramp					1.076			733						1.076			1161	
7	Vista On Ramp		224			1.076		224	957			473			1.076		450	1611	
8	Vista On Ramp Cont	75					75		957		137					145		1611	
9	Lockwood Off Ramp					1.076			882						1.076			1466	
10	Lockwood On Ramp	120	12	910	1.093	1.076	140	12	894	-2%	85	20	1446	1.093	1.076	100	20	1486	3%
11	Mustang Off Ramp					1.025			754						1.025			1386	
12	Mustang On Ramp		34	763	1.287	1.076		34	788	3%		50	1408	1.287	1.076		50	1436	2%
13	Mustang On Ramp Cont.								788									1436	
14	Mustang On Ramp Cont.	168					170		788		32					52		1436	
15	Patrick Off Ramp					1.18			618						1.18			1384	
16	Patrick On Ramp		15	633	1.287	1.18		15	633	0%		22	1380	1.287	1.18		22	1406	2%
17	Patrick On Ramp Cont.	107					118		633		36					46		1406	
18	Tracey Off					1.18			515						1.18			1360	
19	Tracey On		10	673		1.18		10	525	-22%		85	1248		1.18		80	1440	15%
20	USA Parkway Off Ramp								525									1440	
21	USA Parkway On Ramp								525									1440	
22	USA Parkway On Ramp Cont.	3					3		525		6					16		1440	
23	Derby Off Ramp					1.076			522						1.076			1424	
24	Derby On Ramp	2	1	502	1.287	1.076	2	1	523	4%	2	5	1412	1.287	1.076	20	5	1429	1%
25	Orchard Off Ramp					1.025			521						1.025			1409	
26	Orchard On Ramp	7	1	531	1.093	1.025	7	10	531	0%	4	1	1400	1.093	1.025	4	1	1410	1%
27	Painted Rock Off Ramp					1.025			524						1.025			1406	
28	Painted Rock On Ramp	27	3	526	1.093	1.025	30	3	527	0%	61	5	1416	1.093	1.025	61	10	1416	0%
29	Wadsworth Off Ramp			553		1.025			497	-10%			1477		1.025			1355	-8%
30	Wadsworth On Ramp		12	509	1.093	1.125		12	509	0%		13	1370	1.093	1.125		15	1370	0%

I-80 East Corridor Westbound - Table 4

Segment	Location	2007 AM					Balanced AM				2007 PM					Balanced PM			
		Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Mainline	Seasonal Factor Ramp	Off-Ramp	On-Ramp	Mainline Vol	% Change from Count	Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Mainline	Seasonal Factor Ramp	Off-Ramp	On-Ramp	Mainline Vol	% Change from Count
1	Beginning Segment	13		1216	1.093		13		1216	0%	13		689	1.093		13		689	0%
2	Wadsworth Off Ramp					1.084			1203						1.084			676	
3	Wadsworth On Ramp	2	60	1290	1.093	1.084	2	70	1273	-1%	3	35	706	1.093	1.084	3	30	706	0%
4	Painted Rock Off Ramp					1.025			1271						1.025			703	
5	Painted Rock On Ramp	0	5	1319	1.093	1.025	0	19	1290	-2%	1	3	716	1.093	1.025	1	13	716	0%
6	Orchard Off Ramp					1.025			1290						1.025			715	
7	Orchard On Ramp	4	1	1291	1.287	1.025	4	1	1291	0%	4	1	762	1.287	1.025	4	35	750	-2%
8	Derby Off Ramp					1.025			1287						1.025			746	
9	Derby On Ramp	40	3			1.076	30	3	1290		14	5			1.076	14	15	761	
10	USA Parkway Off Ramp								1260									747	
11	USA Parkway On Ramp								1260									747	
12	Tracey Clark Off					1.18			1260									747	
13	Tracey Clark On		44	1325	1.287	1.18		60	1320	0%		191	950	1.287	1.18		203	950	0%
14	Tracey Clark On Cont.	44					35		1320		10					10		950	
15	Patrick Off Ramp					1.18			1285						1.18			940	
16	Patrick On Ramp		40	1391	1.287	1.18		60	1345	-3%		124	1082	1.287	1.18		135	1075	-1%
17	Patrick On Ramp Cont.								1345									1075	
18	Patrick On Ramp Cont.	29					25		1345		20					23		1075	
19	Mustang Off Ramp					1.076			1320						1.076			1052	
20	Mustang On Ramp	14	77	1429	1.093	1.076	14	100	1420	-1%	13	96	1142	1.076	1.076	13	96	1148	1%
21	Lockwood Off Ramp					1.076			1406						1.076			1135	
22	Lockwood On Ramp	274	160	1642	1	1.076	274	180	1586	-3%	225	105	1361		1.076	210	125	1260	-7%
23	Vista Off Ramp					1.076			1312						1.076			1050	
24	Vista On Ramp		1084			1.076		1050	2362			894			1.076		910	1960	
25	Vista On Ramp Cont								2362									1960	
26	Vista On Ramp Cont	137					150		2362		107					99		1960	
27	Sparks Off Ramp			2257	1.076	1.18			2212	-2%			1846	1.076	1.18			1861	1%
28	Sparks On Ramp		1237			1.025		1180	3392			816			1.025		829	2690	
29	Sparks On Ramp Cont.	406					420		3392		333					310		2690	
30	McCarran Off Ramp					1.076			2972						1.076			2380	
31	McCarran On Loop Ramp		229			1.076		201	3173			460			1.076		480	2860	
32	McCarran On Loop Ramp Cont.								3173									2860	
33	McCarran On Ramp		562	3683		1.076		510	3683	0%		526	3400	1	1.076		540	3400	0%

Table 5: Urban Area Capacity Estimation

Urban Area	Alternatives			
	1	2	3	4
Peak Hour Factor (PHF)	0.95	0.95	0.95	0.95
Number of Lanes	2 / 3	2 / 3	2 / 3	2 / 3
Free Flow Speed (FFS)	65	65	65	65
%Trucks&Buses	5%	10%	15%	20%
Level Terrain fHV	0.98	0.95	0.93	0.91
Driver Type	1	1	1	1
Capacity (vphpl)(LOSE)	**2178**	**2126**	**2077**	**2030**
Saturation Flow Rate (vphpl) (LOSD)	**1937**	**1891**	**1847**	**1805**
Saturation Flow Rate (pcphpl)	**2090**	**2090**	**2090**	**2090**
Capacity (pcphpl)	**2350**	**2350**	**2350**	**2350**

Table 6: Rural Area Capacity Estimation Scenario 1

Rural Area	Alternatives									
	1	2	3	4	5	6	7	8	9	10
Peak Hour Factor (PHF)	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	1.88
Number of Lanes	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3	3 / 3
Free Flow Speed (FFS)	70	70	70	70	70	70	70	70	70	70
%Trucks&Buses	5%	10%	15%	20%	25%	5%	10%	15%	20%	20%
Terrain fHV	0.98	0.95	0.93	0.91	0.89	0.93	0.87	0.82	0.77	0.73
Driver Type	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.9
Capacity (vphpl)(LOSE)	**1854**	**1810**	**1768**	**1728**	**1690**	**1768**	**1653**	**1552**	**1462**	**6235**
Saturation Flow Rate (vphpl) (LOSD)	**1661**	**1622**	**1584**	**1548**	**1514**	**1584**	**1481**	**1390**	**1310**	**5585**
Saturation Flow Rate (pcphpl)	**2150**	**2150**	**2150**	**2150**	**2150**	**2150**	**2150**	**2150**	**2150**	**2150**
Capacity (pcphpl)	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**

Table 7: Rural Area Capacity Calculation Scenario 2

Rural Area	Alternatives									
	1	2	3	4	5	6	7	8	9	10
Peak Hour Factor (PHF)	0.88	0.88	0.88	0.88	1.88	0.88	0.88	0.88	0.88	1.88
Number of Lanes	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3	2 / 3	3 / 3
Free Flow Speed (FFS)	70	70	70	70	71	70	70	70	70	70
%Trucks&Buses	5%	10%	15%	20%	25%	5%	10%	15%	20%	20%
Terrain fHV	0.98	0.95	0.93	0.91	0.89	0.93	0.87	0.82	0.77	0.73
Driver Type	1	1	1	1	1	1	1	1	1	2
Capacity (vphpl)(LOSE)	**2060**	**2011**	**1965**	**1920**	**4011**	**1965**	**1837**	**1724**	**1625**	**6563**
Saturation Flow Rate (vphpl) (LOSD)	**1846**	**1802**	**1760**	**1720**	**3593**	**1760**	**1645**	**1544**	**1455**	**5879**
Saturation Flow Rate (pcphpl)	**2150**	**2150**	**2150**	**2150**	**2150**	**2150**	**2150**	**2150**	**2150**	**2150**
Capacity (pcphpl)	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**	**2400**

I-80 West Corridor Eastbound - Table 8

Segment	Location	AADT			K	Peak Hour Calculated D	DDHV	%Change from PHV	Balanced Peak Hour Volumes PM				
		Off-Ramp	On-Ramp	Mainline					Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Ramp	Seasonal Factor Mainline
1	Beginning Segment	799		29100	0.105	0.59	1803	48.62%	92		1213		
2	West Verdi Off				0.105	0.6					1121	0.821	
3	West Verdi On		1132	29641	0.105	0.57	1774	46.73%		88	1209		0.995
4	West Verdi On Cont.				0.105	0.57					1209		
5	Verdi On	743	277	29913	0.105	0.56	1759	43.23%	60	19	1228	0.979	0.995
6	Garson Off				0.105	0.57					1168	0.967	
7	Garson On		2120		0.105	0.56				175	1343	0.892	
8	East Verdi On Acceleration		1877	36931	0.105	0.56	2172	37.53%		236	1579	0.967	0.995
9	East Verdi On	254			0.105	0.56			40		1579		
10	Mogul Off				0.105	0.55					1539	0.967	0.995
11	Mogul On Acceleration		1299	38801	0.105	0.55	2241	38.06%		84	1623	0.983	
12	Mogul On	1257			0.105	0.54			180		1623		
13	West 4th Off	1341			0.105	0.54			194		1443	0.995	
14	Robb Drive Off				0.08	0.53					1249	0.983	
15	Robb Drive On Acceleration		10752	49155	0.08	0.47	1848	-1.64%		630	1879	0.983	0.995
16	Rob Drive On Cont	4830			0.08	0.47			450		1879		
17	West McCarran Off				0.08	0.45					1429	0.961	
18	West McCarran On		13585	66773	0.08	0.43	2297	-1.80%		910	2339	0.961	

LEGEND

Number	2006 AADT
AADT	Annual Average Daily Traffic
K-factor	Proportion of AADT occuring on the 30th highest peak hour
D	Proportion of peak hour traffic in the peak direction
DDHV	Directional design hour volume
PHV	Peak hour volume

I-80 West Corridor Westbound - Table 9

Segment	Location	AADT			K	Peak Hour Calculated D	DDHV	%Change from PHV	2007 Balanced Volumes PM				
		Off-Ramp	On-Ramp	Mainline					Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Ramp	Seasonal Factor Mainline
1	Beginning Segment	15096		66773	0.08	0.57	3045	-0.69%	1338		3066		
2	West McCarran Off				0.08	0.55					1728	1.047	
3	West McCarran On		4912	49155	0.08	0.53	2084	-0.04%	960	357	2085	0.961	0.995
4	Robb Drive Off				0.08	0.47					1125		
5	Robb Drive On, Acceleration		1760		0.08	0.46				110	1235	0.983	
6	Robb Drive On cont				0.105	0.46					1235		
7	West 4th Street On, Acceleration		1245		0.105	0.46				130	1365	0.995	0.995
8	West 4th Street On cont	1222		38801	0.105	0.46	1874	37.30%	140		1365		
9	Exit 7, Mogul Off Ramp				0.105	0.44					1225	0.983	
10	Mogul On, Acceleration		259	36931	0.105	0.45	1745	40.72%		15	1240	0.983	0.995
11	Mogul On cont	1821			0.105	0.45			170		1240		
12	Exit 5, East Verdi Off Ramp	2742			0.105	0.44			190		1070	0.967	
13	Exit 4, Garson Off Ramp				0.105	0.43					880	0.967	
14	Garson On, Acceleration		1270		0.105	0.44				75	955	0.995	0.995
15	Garson On cont	296		29913	0.105	0.44	1382	44.71%	30		955		
16	Exit 3, Verdi Off Ramp	2690		29641	0.105	0.43	1338	44.68%	190		925	0.983	0.995
17	Exit 2, West Verdi Off	49			0.105	0.4			4		735	0.995	
18	Exit 1, West Verdi Off				0.105	0.4					731	0.995	
19	West Verdi On Ramp		2060	29100	0.105	0.41	1253	48.96%		110	841	0.995	

LEGEND

Number	2006 AADT
AADT	Annual Average Daily Traffic
K-factor	Proportion of AADT occuring on the 30th highest peak hour
D	Proportion of peak hour traffic in the peak direction
DDHV	Directional design hour volume
PHV	Peak hour volume

I-80 East Corridor Eastbound - Table 10

Segment	Location	AADT			K	Peak Hour Calculated D	DDHV	%Change from PHV	Balanced Volumes PM				
		Off-Ramp	On-Ramp	Mainline					Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Mainline	Seasonal Factor Ramp
1	Beginning Segment	11030		79583	0.086	0.49	3354	4.18%	882		3219	1.076	
2	E.McCarran Off Ramp				0.086	0.45					2337		1.025
3	E.McCarran On Ramp	10125	4040		0.086	0.54			903	432	2769		1.076
4	Sparks Off Ramp			45715	0.086	0.5	1966	5.35%			1866	1.076	1.076
5	Sparks On Ramp	9965	1454		0.086	0.5			820	115	1981		1.18
6	Vista Off Ramp				0.086	0.53					1161		1.076
7	Vista On Ramp		3632		0.095	0.56				450	1611		1.076
8	Vista On Ramp Cont	1670			0.095	0.56			145		1611		
9	Lockwood Off Ramp				0.095	0.56					1466		1.076
10	Lockwood On Ramp	1285	181	31351	0.095	0.56	1668	12.24%	100	20	1486	1.093	1.076
11	Mustang Off Ramp				0.095	0.57					1386		1.025
12	Mustang On Ramp		461	33787	0.095	0.57	1830	27.41%		50	1436	1.287	1.076
13	Mustang On Ramp Cont.				0.095	0.57					1436		
14	Mustang On Ramp Cont.	1084			0.095	0.6			52		1436		
15	Patrick Off Ramp				0.095	0.59					1384		1.18
16	Patrick On Ramp		196	31990	0.095	0.6	1823	29.69%		22	1406	1.287	1.18
17	Patrick On Ramp Cont.	1297			0.095	0.6			46		1406		
18	Tracey Off				0.095	0.65					1360		1.18
19	Tracey On		504	26334	0.093	0.65	1592	10.55%		80	1440		1.18
20	USA Parkway Off Ramp				0.093	0.65					1440		
21	USA Parkway On Ramp				0.093	0.65					1440		
22	USA Parkway On Ramp Cont.	86			0.093	0.65			16		1440		
23	Derby Off Ramp				0.093	0.66					1424		1.076
24	Derby On Ramp	19	58	29990	0.093	0.66	1841	28.82%	20	5	1429	1.287	1.076
25	Orchard Off Ramp				0.093	0.66					1409		1.025
26	Orchard On Ramp	53	19	25620	0.093	0.66	1573	11.53%	4	1	1410	1.093	1.025
27	Painted Rock Off Ramp				0.093	0.67					1406		1.025
28	Painted Rock On Ramp	531	48	25631	0.093	0.67	1597	12.79%	61	10	1416	1.093	1.025
29	Wadsworth Off Ramp				0.093	0.67					1355		1.025
30	Wadsworth On Ramp		213	24928	0.093	0.67	1553	13.38%		15	1370	1.093	1.125

LEGEND

Number	2006 AADT
AADT	Annual Average Daily Traffic
K-factor	Proportion of AADT occuring on the 30th highest peak hour
D	Proportion of peak hour traffic in the peak direction
DDHV	Directional design hour volume
PHV	Peak hour volume

I-80 East Corridor Westbound - Table 11

Segment	Location	AADT			K	Peak Hour Calculated D	DDHV	%Change from PHV	Balanced Volumes AM				
		Off-Ramp	On-Ramp	Mainline					Off-Ramp	On-Ramp	Mainline Vol	Seasonal Factor Mainline	Seasonal Factor Ramp
1	Beginning Segment	209		24928	0.093	0.7	1623	33.46%	13		1216	1.093	
2	Wadsworth Off Ramp				0.093	0.71					1203		1.084
3	Wadsworth On Ramp	44	558	25631	0.093	0.71	1692	32.95%	2	70	1273	1.093	1.084
4	Painted Rock Off Ramp				0.093	0.71					1271		1.025
5	Painted Rock On Ramp	17	46	25620	0.093	0.71	1692	31.14%	0	19	1290	1.093	1.025
6	Orchard Off Ramp				0.093	0.71					1290		1.025
7	Orchard On Ramp	43	18	29990	0.093	0.71	1980	53.39%	4	1	1291	1.287	1.025
8	Derby Off Ramp				0.093	0.71					1287		1.025
9	Derby On Ramp		70		0.093	0.71				3	1290		1.076
10	USA Parkway Off Ramp				0.093	0.71					1290		
11	USA Parkway On Ramp	499		26334	0.093	0.71	1739	34.79%	30		1290		
12	Tracey Clark Off				0.095	0.71					1260		1.18
13	Tracey Clark On		1380	31990	0.095	0.68	2067	56.56%		60	1320	1.287	1.18
14	Tracey Clark On Cont.	177			0.095	0.68			35		1320		
15	Patrick Off Ramp				0.095	0.62					1285		1.18
16	Patrick On Ramp		851	33787	0.095	0.63	2022	50.35%		60	1345	1.287	1.18
17	Patrick On Ramp Cont.				0.095	0.63					1345		
18	Patrick On Ramp Cont.	255			0.095	0.63			25		1345		
19	Mustang Off Ramp				0.095	0.64					1320		1.076
20	Mustang On Ramp	166	1108	31351	0.095	0.61	1817	27.94%	14	100	1420	1.093	1.076
21	Lockwood Off Ramp				0.095	0.61					1406		1.076
22	Lockwood On Ramp	2934	1613		0.095	0.62			274	180	1586	1	1.076
23	Vista Off Ramp				0.086	0.64					1312		1.076
24	Vista On Ramp		11212		0.086	0.63				1050	2362		1.076
25	Vista On Ramp Cont				0.086	0.63					2362		
26	Vista On Ramp Cont	1206			0.086	0.63			150		2362		
27	Sparks Off Ramp			45715	0.086	0.63	2477	11.97%			2212	1.076	1.18
28	Sparks On Ramp		10596		0.086	0.63				1180	3392		1.025
29	Sparks On Ramp Cont.	4282			0.086	0.63			420		3392		
30	McCarran Off Ramp				0.086	0.6					2972		1.076
31	McCarran On Loop Ramp		3785		0.086	0.64				201	3173		1.076
32	McCarran On Loop Ramp Cont.				0.086	0.64					3173		
33	McCarran On Ramp		8554	79583	0.086	0.6	4106	11.50%		510	3683		1.076

LEGEND

Number	2006 AADT
AADT	Annual Average Daily Traffic
K-factor	Proportion of AADT occuring on the 30th highest peak hour
D	Proportion of peak hour traffic in the peak direction
DDHV	Directional design hour volume
PHV	Peak hour volume

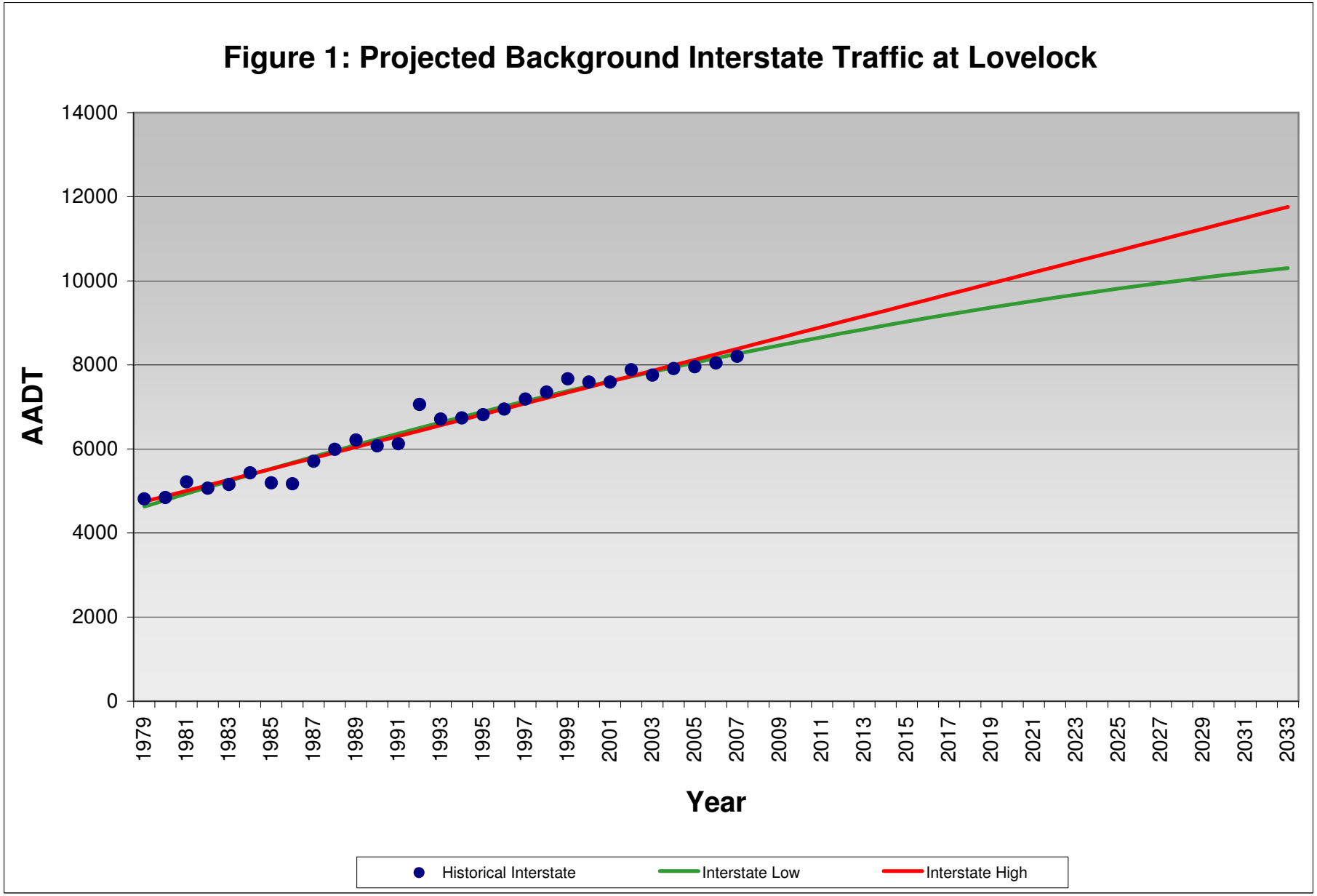


Figure 1: Projected Background Interstate Traffic at Lovelock
AADT
14000
12000
10000
8000
6000
4000
2000
0
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
2027
2029
2031
2033
Year
Historical Interstate
Interstate Low
Interstate High

Figure 2. Projected Background Traffic at NV/CA Border Station

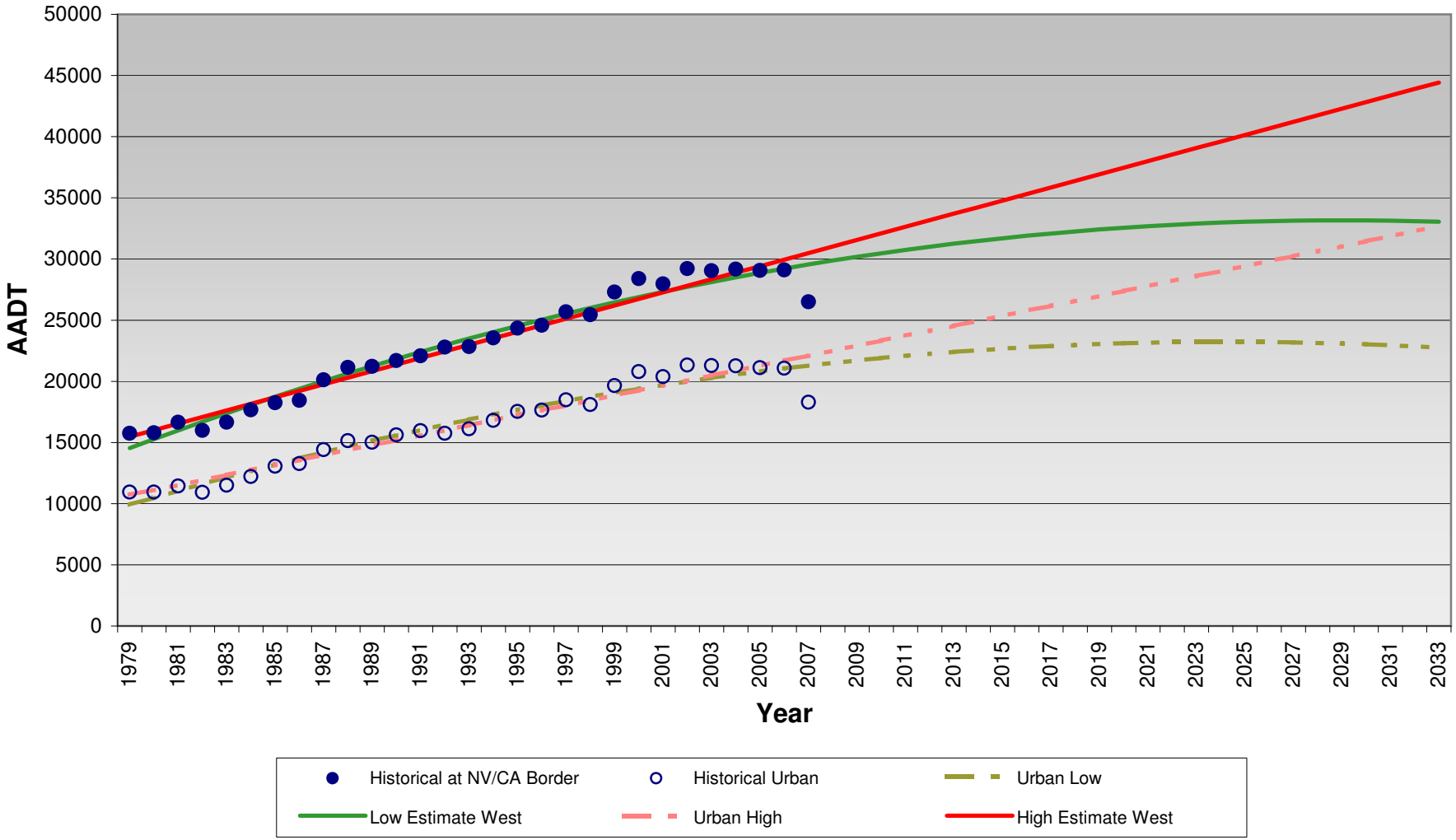


Figure 3. Projected Background Traffic East of USA Parkway

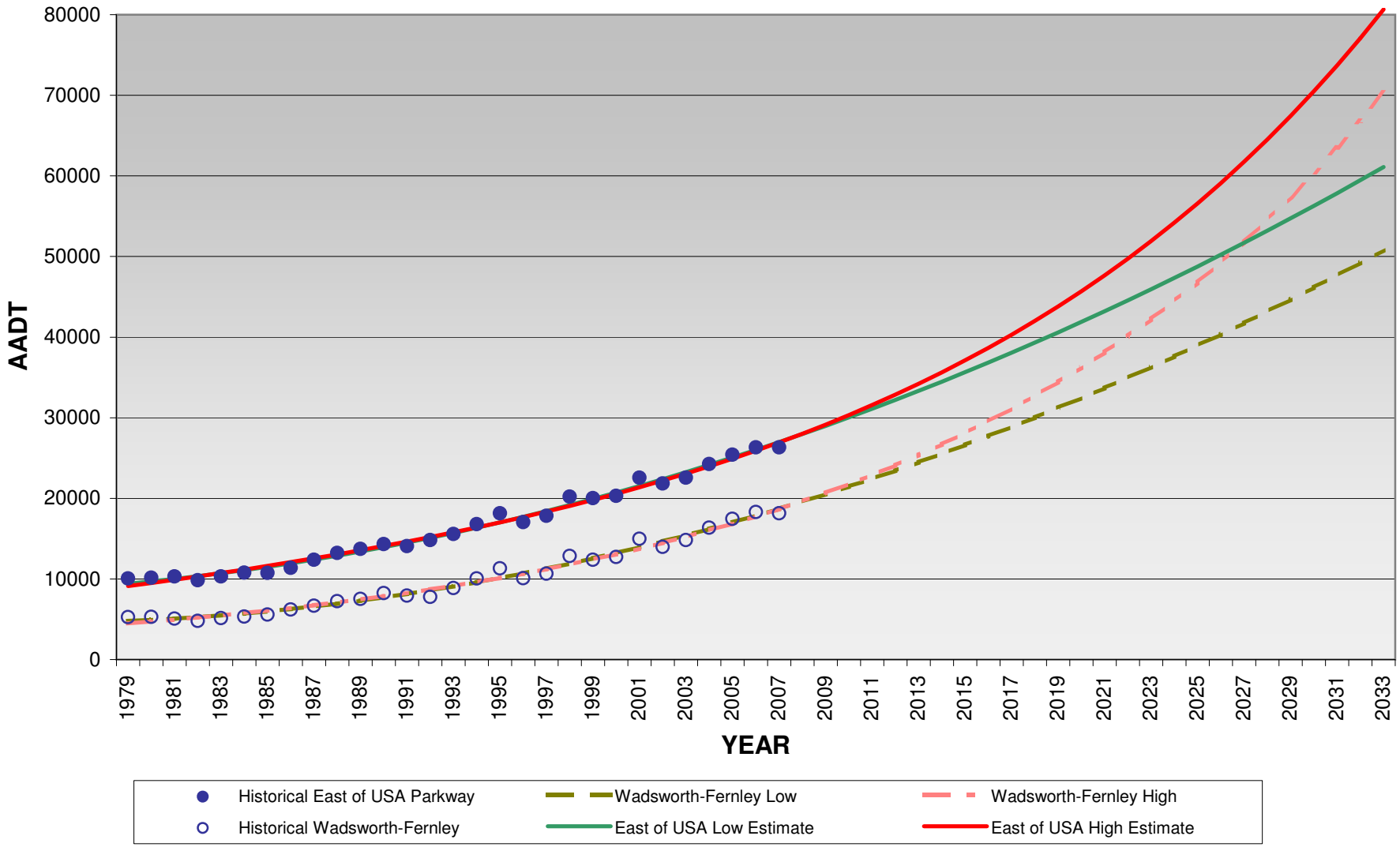


Figure 4. Projected Background Traffic East of Vista Boulevard

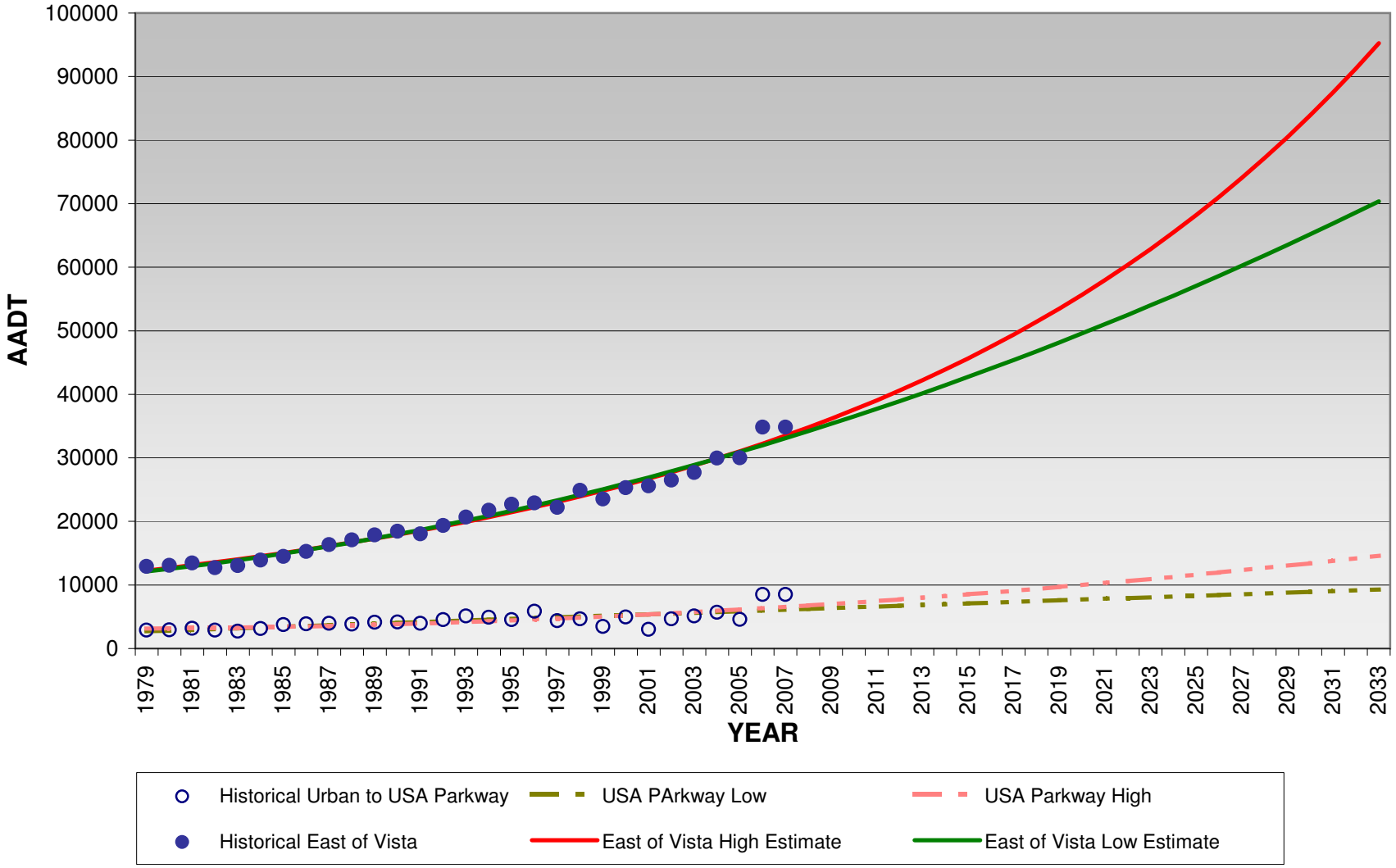
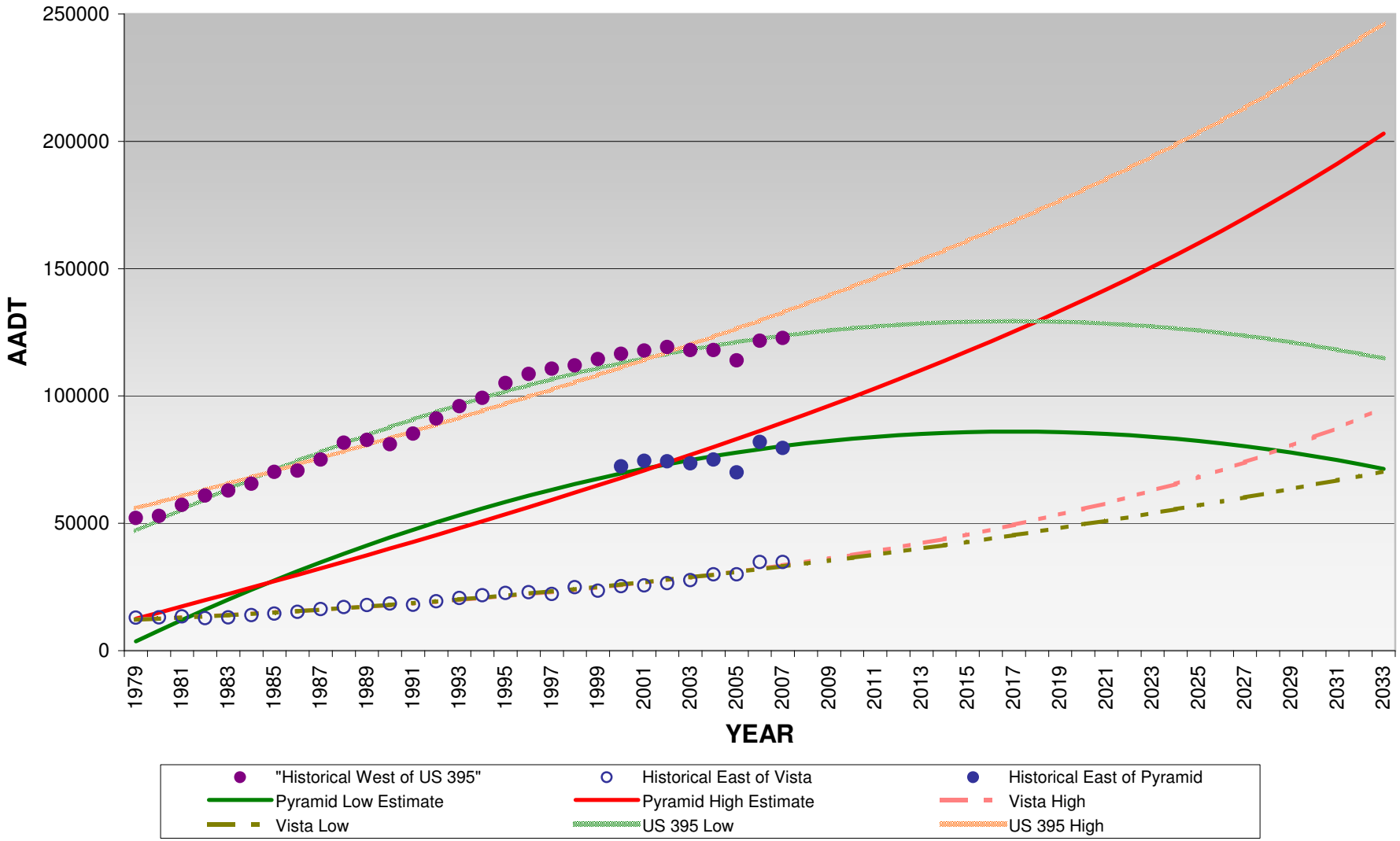


Figure 5. Projected Background Traffic East of Pyramid Highway



LARSONS

Table 1: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2010 Mainline AADT	K	Peak Hour Calculated D	DDHV	2010 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	30466	0.105	0.57	1823	92		1823
2	West Verdi Off	4022	2011	10%	2100	2			0.105	0.57				1731
3	West Verdi On	4022	2011	10%	1740	2	1	33607	0.105	0.57	2011		88	1819
4	West Verdi On Cont.	4022	2011	10%	2960	2			0.105	0.57				1819
5	Verdi On	4022	2011	10%	5100	2	1	33879	0.105	0.57	2028	60	19	1838
6	Garson Off	4022	2011	10%	2920	2			0.105	0.57				1778
7	Garson On	4022	2011	10%	4350	2	1		0.105	0.57			175	1953
8	East Verdi On Acceleration	6033	2011	10%	680	3	1	40897	0.105	0.57	2448		236	2189
9	East Verdi On	4022	2011	10%	880	2	1		0.105	0.57		40		2189
10	Mogul Off	4022	2011	10%	1740	2			0.105	0.57				2149
11	Mogul On Acceleration	6033	2011	10%	450	3	1	42767	0.105	0.57	2560		84	2233
12	Mogul On	4022	2011	10%	1600	2	1		0.105	0.57		180		2233
13	West 4th Off	4022	2011	10%	6980	2	1		0.105	0.57		194		2053
14	Robb Drive Off	4356	2178	5%	1500	2			0.08	0.45				1859
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2	53121	0.08	0.45	1912		630	2489
16	Rob Drive On Cont	6534	2178	5%	1200	3	1		0.08	0.45		450		2489
17	West McCarran Off	4356	2178	5%	4470	2			0.08	0.45				2039
18	West McCarran On	4356	2178	5%	2640	2	1	70739	0.08	0.45	2547		910	2949

Table 2: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2010 Mainline AADT	K	Peak Hour Calculated D	DDHV	2010 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	32096	0.105	0.57	1921	92		1921
2	West Verdi Off	4022	2011	10%	2100	2			0.105	0.57				1829
3	West Verdi On	4022	2011	10%	1740	2	1	35237	0.105	0.57	2109		88	1917
4	West Verdi On Cont.	4022	2011	10%	2960	2			0.105	0.57				1917
5	Verdi On	4022	2011	10%	5100	2	1	35509	0.105	0.57	2125	60	19	1936
6	Garson Off	4022	2011	10%	2920	2			0.105	0.57				1876
7	Garson On	4022	2011	10%	4350	2	1		0.105	0.57			175	2051
8	East Verdi On Acceleration	6033	2011	10%	680	3	1	42527	0.105	0.57	2545		236	2287
9	East Verdi On	4022	2011	10%	880	2	1		0.105	0.57		40		2287
10	Mogul Off	4022	2011	10%	1740	2			0.105	0.57				2247
11	Mogul On Acceleration	6033	2011	10%	450	3	1	44397	0.105	0.57	2657		84	2331
12	Mogul On	4022	2011	10%	1600	2	1		0.105	0.57		180		2331
13	West 4th Off	4022	2011	10%	6980	2	1		0.105	0.57		194		2151
14	Robb Drive Off	4356	2178	5%	1500	2			0.08	0.45				1957
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2	54751	0.08	0.45	1971		630	2587
16	Rob Drive On Cont	6534	2178	5%	1200	3	1		0.08	0.45		450		2587
17	West McCarran Off	4356	2178	5%	4470	2			0.08	0.45				2137
18	West McCarran On	4356	2178	5%	2640	2	1	72369	0.08	0.45	2605		910	3047

Table 3: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2010 Mainline AADT	K	Peak Hour Calculated D	DDHV	2010 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	8712	2178	5%	2500	4	2	68139	0.08	0.55	2998	1338		3600
2	West McCarran Off	6534	2178	5%	4490	3			0.08	0.55				2262
3	West McCarran On	6534	2178	5%	4300	3	1	50521	0.08	0.55	2223	960	357	2619
4	Robb Drive Off	6534	2178	5%	3300	3			0.08	0.55				1659
5	Robb Drive On, Acceleration	6180	2060	5%	430	3	1		0.08	0.55			110	1769
6	Robb Drive On cont	4120	2060	5%	7200	2			0.105	0.43				1769
7	West 4th Street On, Acceleration	6180	2060	5%	440	3	1		0.105	0.43			130	1899
8	West 4th Street On cont	4120	2060	5%	890	2	1	40167	0.105	0.43	1814	140		1899
9	Exit 7, Mogul Off Ramp	4120	2060	5%	700	2			0.105	0.43				1759
10	Mogul On, Acceleration	6180	2060	5%	160	3	1	38297	0.105	0.43	1729		15	1774
11	Mogul On cont	4120	2060	5%	6840	2	1		0.105	0.43		170		1774
12	Exit 5, East Verdi Off Ramp	4120	2060	5%	5350	2	1		0.105	0.43		190		1604
13	Exit 4, Garson Off Ramp	4120	2060	5%	1480	2			0.105	0.43				1414
14	Garson On, Acceleration	5895	1965	15%	765	3	1		0.105	0.43			75	1489
15	Garson On cont	3930	1965	15%	4100	2	1	31279	0.105	0.43	1412	30		1489
16	Exit 3, Verdi Off Ramp	3930	1965	15%	5430	2	1	31007	0.105	0.43	1400	190		1459
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1		0.105	0.43		4		1269
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2			0.105	0.43				1265
19	West Verdi On Ramp	3930	1965	15%	2500	2	1	30466	0.105	0.43	1376		110	1375

Table 4: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2010 Mainline AADT	K	Peak Hour Calculated D	DDHV	2010 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	8712	2178	5%	2500	4	2	69769	0.08	0.55	3070	1338		3674
2	West McCarran Off	6534	2178	5%	4490	3			0.08	0.55				2336
3	West McCarran On	6534	2178	5%	4300	3	1	52151	0.08	0.55	2295	960	357	2693
4	Robb Drive Off	6534	2178	5%	3300	3			0.08	0.55				1733
5	Robb Drive On, Acceleration	6180	2060	5%	430	3	1		0.08	0.55			110	1843
6	Robb Drive On cont	4120	2060	5%	7200	2			0.105	0.43				1843
7	West 4th Street On, Acceleration	6180	2060	5%	440	3	1		0.105	0.43			130	1973
8	West 4th Street On cont	4120	2060	5%	890	2	1	41797	0.105	0.43	1887	140		1973
9	Exit 7, Mogul Off Ramp	4120	2060	5%	700	2			0.105	0.43				1833
10	Mogul On, Acceleration	6180	2060	5%	160	3	1	39927	0.105	0.43	1803		15	1848
11	Mogul On cont	4120	2060	5%	6840	2	1		0.105	0.43		170		1848
12	Exit 5, East Verdi Off Ramp	4120	2060	5%	5350	2	1		0.105	0.43		190		1678
13	Exit 4, Garson Off Ramp	4120	2060	5%	1480	2			0.105	0.43				1488
14	Garson On, Acceleration	5895	1965	15%	765	3	1		0.105	0.43			75	1563
15	Garson On cont	3930	1965	15%	4100	2	1	32909	0.105	0.43	1486	30		1563
16	Exit 3, Verdi Off Ramp	3930	1965	15%	5430	2	1	32637	0.105	0.43	1474	190		1533
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1		0.105	0.43		4		1343
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2			0.105	0.43				1339
19	West Verdi On Ramp	3930	1965	15%	2500	2	1	32096	0.105	0.43	1449		110	1449

Table 5: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2010 Mainline AADT	K	Peak Hour Calculated D	DDHV	Balanced Volumes PM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4356	2178	5%	2640	2	1	81272	0.086	0.5	3495	882		**3586**
2	E.McCarran Off Ramp	4356	2178	5%	2540	2			0.086	0.5				2704
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1		0.086	0.5		903	432	3136
4	Sparks Off Ramp	4356	2178	5%	2000	2		47404	0.086	0.5	2038			2233
5	Sparks On Ramp	4356	2178	5%	1500	2	1		0.086	0.5		820	115	2348
6	Vista Off Ramp	4356	2178	5%	2200	2			0.086	0.5				1528
7	Vista On Ramp	4252	2126	10%	3600	2	1	36520	0.095	0.57	1978		450	1978
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	36520	0.095	0.57	1978	145		1978
9	Lockwood Off Ramp	4022	2011	10%	1800	2			0.095	0.57				1833
10	Lockwood On Ramp	4022	2011	10%	5460	2	1	33040	0.095	0.57	1789	100	20	1853
11	Mustang Off Ramp	4022	2011	10%	3069	2			0.095	0.57				1753
12	Mustang On Ramp	4022	2011	10%	13300	2	1	35476	0.095	0.57	1921		50	1803
13	Mustang On Ramp Cont.	4022	2011	10%	5280	2			0.095	0.57				1803
14	Mustang On Ramp Cont.	4022	2011	10%	4180	2	1		0.095	0.57		52		1803
15	Patrick Off Ramp	4022	2011	10%	2680	2			0.095	0.57				1751
16	Patrick On Ramp	4022	2011	10%	8960	2	1	33679	0.095	0.57	1824	46	22	1773
17	USA Parkway Off Ramp	4022	2011	10%	2220	2			0.093	0.57				1727
18	USA Parkway On Ramp	4022	2011	10%	10560	2		30039	0.093	0.66	1844		**100**	1827
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1		0.093	0.66		16		1827
20	Derby Off Ramp	4022	2011	10%	2020	2			0.093	0.66				1811
21	Derby On Ramp	4022	2011	10%	8980	2	1	33695	0.093	0.66	2068	20	5	1816
22	Orchard Off Ramp	4022	2011	10%	1750	2			0.093	0.66				1796
23	Orchard On Ramp	4022	2011	10%	4320	2	1	29325	0.093	0.66	1800	4	1	1797
24	Painted Rock Off Ramp	4022	2011	10%	1800	2			0.093	0.66				1793
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	29336	0.093	0.66	1801	61	10	1803
26	Wadsworth Off Ramp	4022	2011	10%	2640	2			0.093	0.66				1742
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1	28633	0.093	0.66	1757		15	1757

Table 6: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2010 Mainline AADT	K	Peak Hour Calculated D	DDHV	Balanced Volumes PM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4356	2178	5%	2640	2	1	82332	0.086	0.5	3540	882		**3643**
2	E.McCarran Off Ramp	4356	2178	5%	2540	2			0.086	0.5				2761
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1		0.086	0.5		903	432	3193
4	Sparks Off Ramp	4356	2178	5%	2000	2		48464	0.086	0.5	2084			2290
5	Sparks On Ramp	4356	2178	5%	1500	2	1		0.086	0.5		820	115	2405
6	Vista Off Ramp	4356	2178	5%	2200	2			0.086	0.5				1585
7	Vista On Ramp	4252	2126	10%	3600	2	1	37580	0.095	0.57	2035		450	2035
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	36520	0.095	0.57	1978	145		2035
9	Lockwood Off Ramp	4022	2011	10%	1800	2			0.095	0.57				1890
10	Lockwood On Ramp	4022	2011	10%	5460	2	1	34100	0.095	0.57	1847	100	20	1910
11	Mustang Off Ramp	4022	2011	10%	3069	2			0.095	0.57				1810
12	Mustang On Ramp	4022	2011	10%	13300	2	1	36536	0.095	0.57	1978		50	1860
13	Mustang On Ramp Cont.	4022	2011	10%	5280	2			0.095	0.57				1860
14	Mustang On Ramp Cont.	4022	2011	10%	4180	2	1		0.095	0.57		52		1860
15	Patrick Off Ramp	4022	2011	10%	2680	2			0.095	0.57				1808
16	Patrick On Ramp	4022	2011	10%	8960	2	1	34739	0.095	0.57	1881	46	22	1830
17	USA Parkway Off Ramp	4022	2011	10%	2220	2			0.093	0.57				1784
18	USA Parkway On Ramp	4022	2011	10%	10560	2		30337	0.093	0.66	1862		80	1864
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1		0.093	0.66		16		1864
20	Derby Off Ramp	4022	2011	10%	2020	2			0.093	0.66				1848
21	Derby On Ramp	4022	2011	10%	8980	2	1	33993	0.093	0.66	2086	20	5	1853
22	Orchard Off Ramp	4022	2011	10%	1750	2			0.093	0.66				1833
23	Orchard On Ramp	4022	2011	10%	4320	2	1	29623	0.093	0.66	1818	4	1	1834
24	Painted Rock Off Ramp	4022	2011	10%	1800	2			0.093	0.66				1830
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	29634	0.093	0.66	1819	61	10	1840
26	Wadsworth Off Ramp	4022	2011	10%	2640	2			0.093	0.66				1779
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1	28931	0.093	0.66	1776		15	1794

Table 7: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2010 Mainline AADT	K	Peak Hour Calculated D	DDHV	2010 Balanced Volumes AM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	28633	0.093	0.70	1864	13		**1882**
2	Wadsworth Off Ramp	4022	2011	10%	2290	2			0.093	0.70				1869
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	29336	0.093	0.70	1910	2	70	1939
4	Painted Rock Off Ramp	4022	2011	10%	2340	2			0.093	0.70				1937
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	29325	0.093	0.70	1909	0	19	1956
6	Orchard Off Ramp	4022	2011	10%	1710	2			0.093	0.70				1956
7	Orchard On Ramp	4022	2011	10%	8730	2	1	33695	0.093	0.70	2194	4	1	1957
8	Derby Off Ramp	4022	2011	10%	2430	2			0.093	0.70				1953
9	Derby On Ramp	4022	2011	10%	19800	2	1	30039	0.093	0.70	1956	30	3	1956
10	USA Parkway Off Ramp	4022	2011	10%	2800	2			0.093	0.65				1926
11	USA Parkway On Ramp	4120	2060	5%	2150	2	1	33679	0.093	0.65	2036	35	**63**	1989
12	Patrick Off Ramp	4120	2060	5%	890	2			0.095	0.65				1954
13	Patrick On Ramp	4120	2060	5%	3060	2	1	35476	0.095	0.65	2191		60	2014
14	Patrick On Ramp Cont.	4120	2060	5%	5280	2			0.095	0.65				2014
15	Patrick On Ramp Cont.	4120	2060	5%	12032	2	1		0.095	0.65		25		2014
16	Mustang Off Ramp	4120	2060	5%	3080	2			0.095	0.65				1989
17	Mustang On Ramp	4120	2060	5%	6860	2	1	33040	0.095	0.65	2040	14	100	2089
18	Lockwood Off Ramp	4120	2060	5%	1175	2			0.095	0.65				2075
19	Lockwood On Ramp	4120	2060	5%	12400	2	1	36520	0.095	0.65	2255	274	180	2255
20	Vista Off Ramp	4356	2178	5%	2250	2			0.086	0.65				1981
21	Vista On Ramp	6534	2178	5%	350	3	1		0.086	0.65			1050	3031
22	Vista On Ramp Cont	4356	2178	5%	1100	2			0.086	0.65				3031
23	Vista On Ramp Cont	6534	2178	5%	620	3	1		0.086	0.65		150		3031
24	Sparks Off Ramp	4356	2178	5%	3050	2		47404	0.086	0.65	2650			2881
25	Sparks On Ramp	6534	2178	5%	450	3	1		0.086	0.65			1180	4061
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1		0.086	0.65		420		4061
27	McCarran Off Ramp	4356	2178	5%	1375	2			0.086	0.65				3641
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		0.086	0.65			201	3842
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2			0.086	0.65				3842
30	McCarran On Ramp	6534	2178	5%	2640	3	1	81272	0.086	0.65	4543		510	4352

Table 8: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2010 Mainline AADT	K	Peak Hour Calculated D	DDHV	2010 Balanced Volumes AM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	28931	0.093	0.70	1883	13		**1901**
2	Wadsworth Off Ramp	4022	2011	10%	2290	2			0.093	0.70				1888
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	29634	0.093	0.70	1929	2	70	1958
4	Painted Rock Off Ramp	4022	2011	10%	2340	2			0.093	0.70				1956
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	29623	0.093	0.70	1928	0	19	1975
6	Orchard Off Ramp	4022	2011	10%	1710	2			0.093	0.70				1975
7	Orchard On Ramp	4022	2011	10%	8730	2	1	33993	0.093	0.70	2213	4	1	1976
8	Derby Off Ramp	4022	2011	10%	2430	2			0.093	0.70				1972
9	Derby On Ramp	4022	2011	10%	19800	2	1	30337	0.093	0.70	1975	30	3	1975
10	USA Parkway Off Ramp	4022	2011	10%	2800	2			0.093	0.65				1945
11	USA Parkway On Ramp	4120	2060	5%	2150	2	1	34739	0.093	0.65	2100	35	**110**	2055
12	Patrick Off Ramp	4120	2060	5%	890	2			0.095	0.65				2020
13	Patrick On Ramp	4120	2060	5%	3060	2	1	36536	0.095	0.65	2256		60	2080
14	Patrick On Ramp Cont.	4120	2060	5%	5280	2			0.095	0.65				2080
15	Patrick On Ramp Cont.	4120	2060	5%	12032	2	1		0.095	0.65		25		2080
16	Mustang Off Ramp	4120	2060	5%	3080	2			0.095	0.65				2055
17	Mustang On Ramp	4120	2060	5%	6860	2	1	34100	0.095	0.65	2106	14	100	2155
18	Lockwood Off Ramp	4120	2060	5%	1175	2			0.095	0.65				2141
19	Lockwood On Ramp	4120	2060	5%	12400	2	1	37580	0.095	0.65	2321	274	180	2321
20	Vista Off Ramp	4356	2178	5%	2250	2			0.086	0.65				2047
21	Vista On Ramp	6534	2178	5%	350	3	1		0.086	0.65			1050	3097
22	Vista On Ramp Cont	4356	2178	5%	1100	2			0.086	0.65				3097
23	Vista On Ramp Cont	6534	2178	5%	620	3	1		0.086	0.65		150		3097
24	Sparks Off Ramp	4356	2178	5%	3050	2		48464	0.086	0.65	2709			2947
25	Sparks On Ramp	6534	2178	5%	450	3	1		0.086	0.65			1180	4127
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1		0.086	0.65		420		4127
27	McCarran Off Ramp	4356	2178	5%	1375	2			0.086	0.65				3707
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		0.086	0.65			201	3908
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2			0.086	0.65				3908
30	McCarran On Ramp	6534	2178	5%	2640	3	1	82332	0.086	0.65	4602		510	4418

Table 9: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2015 Mainline AADT	K	Peak Hour Calculated D	DDHV	2015 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	31697	0.105	0.57	1897	92		1897
2	West Verdi Off	4022	2011	10%	2100	2			0.105	0.57				1805
3	West Verdi On	4022	2011	10%	1740	2	1	34838	0.105	0.57	2085		88	1893
4	West Verdi On Cont.	4022	2011	10%	2960	2			0.105	0.57				1893
5	Verdi On	4022	2011	10%	5100	2	1	35110	0.105	0.57	2101	60	19	1912
6	Garson Off	4022	2011	10%	2920	2			0.105	0.57				1852
7	Garson On	4022	2011	10%	4350	2	1		0.105	0.57			175	2027
8	East Verdi On Acceleration	6033	2011	10%	680	3	1	42128	0.105	0.57	2521		236	2263
9	East Verdi On	4022	2011	10%	880	2	1		0.105	0.57		40		2263
10	Mogul Off	4022	2011	10%	1740	2			0.105	0.57				2223
11	Mogul On Acceleration	6033	2011	10%	450	3	1	43998	0.105	0.57	2633		84	2307
12	Mogul On	4022	2011	10%	1600	2	1		0.105	0.57		180		2307
13	West 4th Off	4022	2011	10%	6980	2	1		0.105	0.57		194		2127
14	Robb Drive Off	4356	2178	5%	1500	2			0.08	0.45				1933
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2	54352	0.08	0.45	1957		630	2563
16	Rob Drive On Cont	6534	2178	5%	1200	3	1		0.08	0.45		450		2563
17	West McCarran Off	4356	2178	5%	4470	2			0.08	0.45				2113
18	West McCarran On	4356	2178	5%	2640	2	1	71970	0.08	0.45	2591		910	3023

Table 10: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2015 Mainline AADT	K	Peak Hour Calculated D	DDHV	2015 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	34777	0.105	0.57	2081	92		2081
2	West Verdi Off	4022	2011	10%	2100	2			0.105	0.57				1989
3	West Verdi On	4022	2011	10%	1740	2	1	37918	0.105	0.57	2269		88	2077
4	West Verdi On Cont.	4022	2011	10%	2960	2			0.105	0.57				2077
5	Verdi On	4022	2011	10%	5100	2	1	38190	0.105	0.57	2286	60	19	2096
6	Garson Off	4022	2011	10%	2920	2			0.105	0.57				2036
7	Garson On	4022	2011	10%	4350	2	1		0.105	0.57			175	2211
8	East Verdi On Acceleration	6033	2011	10%	680	3	1	45208	0.105	0.57	2706		236	2447
9	East Verdi On	4022	2011	10%	880	2	1		0.105	0.57		40		2447
10	Mogul Off	4022	2011	10%	1740	2			0.105	0.57				2407
11	Mogul On Acceleration	6033	2011	10%	450	3	1	47078	0.105	0.57	2818		84	2491
12	Mogul On	4022	2011	10%	1600	2	1		0.105	0.57		180		2491
13	West 4th Off	4022	2011	10%	6980	2	1		0.105	0.57		194		2311
14	Robb Drive Off	4356	2178	5%	1500	2			0.08	0.45				2117
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2	57432	0.08	0.45	2068		630	2747
16	Rob Drive On Cont	6534	2178	5%	1200	3	1		0.08	0.45		450		2747
17	West McCarran Off	4356	2178	5%	4470	2			0.08	0.45				2297
18	West McCarran On	4356	2178	5%	2640	2	1	75050	0.08	0.45	2702		910	3207

Table 11: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2015 Mainline AADT	K	Peak Hour Calculated D	DDHV	2015 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	8712	2178	5%	2500	4	2	69370	0.08	0.55	3052	1338		3650
2	West McCarran Off	6534	2178	5%	4490	3			0.08	0.55				2312
3	West McCarran On	6534	2178	5%	4300	3	1	51752	0.08	0.55	2277	960	357	2669
4	Robb Drive Off	6534	2178	5%	3300	3			0.08	0.55				1709
5	Robb Drive On, Acceleration	6180	2060	5%	430	3	1		0.08	0.55			110	1819
6	Robb Drive On cont	4120	2060	5%	7200	2			0.105	0.43				1819
7	West 4th Street On, Acceleration	6180	2060	5%	440	3	1		0.105	0.43			130	1949
8	West 4th Street On cont	4120	2060	5%	890	2	1	41398	0.105	0.43	1869	140		1949
9	Exit 7, Mogul Off Ramp	4120	2060	5%	700	2			0.105	0.43				1809
10	Mogul On, Acceleration	6180	2060	5%	160	3	1	39528	0.105	0.43	1785		15	1824
11	Mogul On cont	4120	2060	5%	6840	2	1		0.105	0.43		170		1824
12	Exit 5, East Verdi Off Ramp	4120	2060	5%	5350	2	1		0.105	0.43		190		1654
13	Exit 4, Garson Off Ramp	4120	2060	5%	1480	2			0.105	0.43				1464
14	Garson On, Acceleration	5895	1965	15%	765	3	1		0.105	0.43			75	1539
15	Garson On cont	3930	1965	15%	4100	2	1	32510	0.105	0.43	1468	30		1539
16	Exit 3, Verdi Off Ramp	3930	1965	15%	5430	2	1	32238	0.105	0.43	1456	190		1509
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1		0.105	0.43		4		1319
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2			0.105	0.43				1315
19	West Verdi On Ramp	3930	1965	15%	2500	2	1	31697	0.105	0.43	1431		110	1425

Table 12: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2015 Mainline AADT	K	Peak Hour Calculated D	DDHV	2015 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	8712	2178	5%	2500	4	2	72450	0.08	0.55	3188	1338		**3795**
2	West McCarran Off	6534	2178	5%	4490	3			0.08	0.55				2457
3	West McCarran On	6534	2178	5%	4300	3	1	54832	0.08	0.55	2413	960	357	2814
4	Robb Drive Off	6534	2178	5%	3300	3			0.08	0.55				1854
5	Robb Drive On, Acceleration	6180	2060	5%	430	3	1		0.08	0.55			110	1964
6	Robb Drive On cont	4120	2060	5%	7200	2			0.105	0.43				1964
7	West 4th Street On, Acceleration	6180	2060	5%	440	3	1		0.105	0.43			130	2094
8	West 4th Street On cont	4120	2060	5%	890	2	1	44478	0.105	0.43	2008	140		2094
9	Exit 7, Mogul Off Ramp	4120	2060	5%	700	2			0.105	0.43				1954
10	Mogul On, Acceleration	6180	2060	5%	160	3	1	42608	0.105	0.43	1924		15	1969
11	Mogul On cont	4120	2060	5%	6840	2	1		0.105	0.43		170		1969
12	Exit 5, East Verdi Off Ramp	4120	2060	5%	5350	2	1		0.105	0.43		190		1799
13	Exit 4, Garson Off Ramp	4120	2060	5%	1480	2			0.105	0.43				1609
14	Garson On, Acceleration	5895	1965	15%	765	3	1		0.105	0.43			75	1684
15	Garson On cont	3930	1965	15%	4100	2	1	35590	0.105	0.43	1607	30		1684
16	Exit 3, Verdi Off Ramp	3930	1965	15%	5430	2	1	35318	0.105	0.43	1595	190		1654
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1		0.105	0.43		4		1464
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2			0.105	0.43				1460
19	West Verdi On Ramp	3930	1965	15%	2500	2	1	34777	0.105	0.43	1570		110	1570

Table 13: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2015 Mainline AADT	K	Peak Hour Calculated D	DDHV	2015 Balanced Volumes PM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	6534	2178	5%	2640	3	1	87491	0.086	0.5	3762	882		**3922**
2	E.McCarran Off Ramp	4356	2178	5%	2540	2			0.086	0.5				3040
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1		0.086	0.5		903	432	3472
4	Sparks Off Ramp	4356	2178	5%	2000	2		53623	0.086	0.5	2306			2569
5	Sparks On Ramp	4356	2178	5%	1500	2	1		0.086	0.5		820	115	2684
6	Vista Off Ramp	4356	2178	5%	2200	2			0.086	0.5				1864
7	Vista On Ramp	4252	2126	10%	3600	2	1	42739	0.095	0.57	2314		450	2314
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	36520	0.095	0.57	1978	145		2314
9	Lockwood Off Ramp	4022	2011	10%	1800	2			0.095	0.57				2169
10	Lockwood On Ramp	4022	2011	10%	5460	2	1	39259	0.095	0.57	2126	100	20	2189
11	Mustang Off Ramp	4022	2011	10%	3069	2			0.095	0.57				2089
12	Mustang On Ramp	4022	2011	10%	13300	2	1	41695	0.095	0.57	2258		50	2139
13	Mustang On Ramp Cont.	4022	2011	10%	5280	2			0.095	0.57				2139
14	Mustang On Ramp Cont.	4022	2011	10%	4180	2	1		0.095	0.57		52		2139
15	Patrick Off Ramp	4022	2011	10%	2680	2			0.095	0.57				2087
16	Patrick On Ramp	4022	2011	10%	8960	2	1	39898	0.095	0.57	2160	46	22	2109
17	USA Parkway Off Ramp	4022	2011	10%	2220	2			0.093	0.57				2063
18	USA Parkway On Ramp	4022	2011	10%	10560	2		35648	0.093	0.66	2188		**125**	2188
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1		0.093	0.66		16		2188
20	Derby Off Ramp	4022	2011	10%	2020	2			0.093	0.66				2172
21	Derby On Ramp	4022	2011	10%	8980	2	1	39304	0.093	0.66	2412	20	5	2177
22	Orchard Off Ramp	4022	2011	10%	1750	2			0.093	0.66				2157
23	Orchard On Ramp	4022	2011	10%	4320	2	1	34934	0.093	0.66	2144	4	1	2158
24	Painted Rock Off Ramp	4022	2011	10%	1800	2			0.093	0.66				2154
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	34945	0.093	0.66	2145	61	10	2164
26	Wadsworth Off Ramp	4022	2011	10%	2640	2			0.093	0.66				2103
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1	34242	0.093	0.66	2102		15	2118

Table 14: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2015 Mainline AADT	K	Peak Hour Calculated D	DDHV	2015 Balanced Volumes PM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	6534	2178	5%	2640	3	1	90405	0.086	0.5	3887	882		**4080**
2	E.McCarran Off Ramp	4356	2178	5%	2540	2			0.086	0.5				3198
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1		0.086	0.5		903	432	3630
4	Sparks Off Ramp	4356	2178	5%	2000	2		56537	0.086	0.5	2431			2727
5	Sparks On Ramp	4356	2178	5%	1500	2	1		0.086	0.5		820	115	2842
6	Vista Off Ramp	4356	2178	5%	2200	2			0.086	0.5				2022
7	Vista On Ramp	4252	2126	10%	3600	2	1	45653	0.095	0.57	2472		450	2472
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	36520	0.095	0.57	1978	145		2472
9	Lockwood Off Ramp	4022	2011	10%	1800	2			0.095	0.57				2327
10	Lockwood On Ramp	4022	2011	10%	5460	2	1	42173	0.095	0.57	2284	100	20	2347
11	Mustang Off Ramp	4022	2011	10%	3069	2			0.095	0.57				2247
12	Mustang On Ramp	4022	2011	10%	13300	2	1	44609	0.095	0.57	2416		50	2297
13	Mustang On Ramp Cont.	4022	2011	10%	5280	2			0.095	0.57				2297
14	Mustang On Ramp Cont.	4022	2011	10%	4180	2	1		0.095	0.57		52		2297
15	Patrick Off Ramp	4022	2011	10%	2680	2			0.095	0.57				2245
16	Patrick On Ramp	4022	2011	10%	8960	2	1	42812	0.095	0.57	2318	**68**	22	2267
17	USA Parkway Off Ramp	4022	2011	10%	2220	2			0.093	0.57				2199
18	USA Parkway On Ramp	4022	2011	10%	10560	2		37123	0.093	0.66	2279		80	2279
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1		0.093	0.66		16		2279
20	Derby Off Ramp	4022	2011	10%	2020	2			0.093	0.66				2263
21	Derby On Ramp	4022	2011	10%	8980	2	1	40779	0.093	0.66	2503	20	5	2268
22	Orchard Off Ramp	4022	2011	10%	1750	2			0.093	0.66				2248
23	Orchard On Ramp	4022	2011	10%	4320	2	1	36409	0.093	0.66	2235	4	1	2249
24	Painted Rock Off Ramp	4022	2011	10%	1800	2			0.093	0.66				2245
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	36420	0.093	0.66	2235	61	10	2255
26	Wadsworth Off Ramp	4022	2011	10%	2640	2			0.093	0.66				2194
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1	35717	0.093	0.66	2192		15	2209

Table 15: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2015 Mainline AADT	K	Peak Hour Calculated D	DDHV	2015 Balanced Volumes AM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	34242	0.093	0.70	2229	13		**2250**
2	Wadsworth Off Ramp	4022	2011	10%	2290	2			0.093	0.70				2237
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	34945	0.093	0.70	2275	2	70	2307
4	Painted Rock Off Ramp	4022	2011	10%	2340	2			0.093	0.70				2305
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	34934	0.093	0.70	2274	0	19	2324
6	Orchard Off Ramp	4022	2011	10%	1710	2			0.093	0.70				2324
7	Orchard On Ramp	4022	2011	10%	8730	2	1	39304	0.093	0.70	2559	4	1	2325
8	Derby Off Ramp	4022	2011	10%	2430	2			0.093	0.70				2321
9	Derby On Ramp	4022	2011	10%	19800	2	1	35648	0.093	0.70	2321	30	3	2324
10	USA Parkway Off Ramp	4022	2011	10%	2800	2			0.093	0.65				2294
11	USA Parkway On Ramp	4120	2060	5%	2150	2	1	39898	0.093	0.65	2412	35	**79**	2373
12	Patrick Off Ramp	4120	2060	5%	890	2			0.095	0.65				2338
13	Patrick On Ramp	4120	2060	5%	3060	2	1	41695	0.095	0.65	2575		60	2398
14	Patrick On Ramp Cont.	4120	2060	5%	5280	2			0.095	0.65				2398
15	Patrick On Ramp Cont.	4120	2060	5%	12032	2	1		0.095	0.65		25		2398
16	Mustang Off Ramp	4120	2060	5%	3080	2			0.095	0.65				2373
17	Mustang On Ramp	4120	2060	5%	6860	2	1	39259	0.095	0.65	2424	14	100	2473
18	Lockwood Off Ramp	4120	2060	5%	1175	2			0.095	0.65				2459
19	Lockwood On Ramp	4120	2060	5%	12400	2	1	42739	0.095	0.65	2639	274	180	2639
20	Vista Off Ramp	4356	2178	5%	2250	2			0.086	0.65				2365
21	Vista On Ramp	6534	2178	5%	350	3	1		0.086	0.65			1050	3415
22	Vista On Ramp Cont	4356	2178	5%	1100	2			0.086	0.65				3415
23	Vista On Ramp Cont	6534	2178	5%	620	3	1		0.086	0.65		150		3415
24	Sparks Off Ramp	4356	2178	5%	3050	2		53623	0.086	0.65	2998			3265
25	Sparks On Ramp	6534	2178	5%	450	3	1		0.086	0.65			1180	4445
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1		0.086	0.65		420		4445
27	McCarran Off Ramp	4356	2178	5%	1375	2			0.086	0.65				4025
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		0.086	0.65			201	4226
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2			0.086	0.65				4226
30	McCarran On Ramp	6534	2178	5%	2640	3	1	87491	0.086	0.65	4891		510	4736

Table 16: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2015 Mainline AADT	K	Peak Hour Calculated D	DDHV	2015 Balanced Volumes AM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	35717	0.093	0.70	2325	13		**2343**
2	Wadsworth Off Ramp	4022	2011	10%	2290	2			0.093	0.70				2330
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	36420	0.093	0.70	2371	2	70	2400
4	Painted Rock Off Ramp	4022	2011	10%	2340	2			0.093	0.70				2398
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	36409	0.093	0.70	2370	0	19	2417
6	Orchard Off Ramp	4022	2011	10%	1710	2			0.093	0.70				2417
7	Orchard On Ramp	4022	2011	10%	8730	2	1	40779	0.093	0.70	2655	4	1	2418
8	Derby Off Ramp	4022	2011	10%	2430	2			0.093	0.70				2414
9	Derby On Ramp	4022	2011	10%	19800	2	1	37123	0.093	0.70	2417	30	3	2417
10	USA Parkway Off Ramp	4022	2011	10%	2800	2			0.093	0.65				2387
11	USA Parkway On Ramp	4120	2060	5%	2150	2	1	42812	0.093	0.65	2588	35	**166**	2553
12	Patrick Off Ramp	4120	2060	5%	890	2			0.095	0.65				2518
13	Patrick On Ramp	4120	2060	5%	3060	2	1	44609	0.095	0.65	2755		60	2578
14	Patrick On Ramp Cont.	4120	2060	5%	5280	2			0.095	0.65				2578
15	Patrick On Ramp Cont.	4120	2060	5%	12032	2	1		0.095	0.65		25		2578
16	Mustang Off Ramp	4120	2060	5%	3080	2			0.095	0.65				2553
17	Mustang On Ramp	4120	2060	5%	6860	2	1	42173	0.095	0.65	2604	14	100	2653
18	Lockwood Off Ramp	4120	2060	5%	1175	2			0.095	0.65				2639
19	Lockwood On Ramp	4120	2060	5%	12400	2	1	45653	0.095	0.65	2819	274	180	2819
20	Vista Off Ramp	4356	2178	5%	2250	2			0.086	0.65				2545
21	Vista On Ramp	6534	2178	5%	350	3	1		0.086	0.65			1050	3595
22	Vista On Ramp Cont	4356	2178	5%	1100	2			0.086	0.65				3595
23	Vista On Ramp Cont	6534	2178	5%	620	3	1		0.086	0.65		150		3595
24	Sparks Off Ramp	4356	2178	5%	3050	2		56537	0.086	0.65	3160			3445
25	Sparks On Ramp	6534	2178	5%	450	3	1		0.086	0.65			1180	4625
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1		0.086	0.65		420		4625
27	McCarran Off Ramp	4356	2178	5%	1375	2			0.086	0.65				4205
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		0.086	0.65			201	4406
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2			0.086	0.65				4406
30	McCarran On Ramp	6534	2178	5%	2640	3	1	90405	0.086	0.65	5054		510	4916

Table 17: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2023 Mainline AADT	K	Peak Hour Calculated D	DDHV	2023 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	32892	0.105	0.57	1969	92		1969
2	West Verdi Off	4022	2011	10%	2100	2			0.105	0.57				1877
3	West Verdi On	4022	2011	10%	1740	2	1	36033	0.105	0.57	2157		88	1965
4	West Verdi On Cont.	4022	2011	10%	2960	2			0.105	0.57				1965
5	Verdi On	4252	2126	10%	5100	2	1	36305	0.105	0.57	2173	60	19	1984
6	Garson Off	4252	2126	10%	2920	2			0.105	0.57				1924
7	Garson On	4252	2126	10%	4350	2	1		0.105	0.57			175	2099
8	East Verdi On Acceleration	6378	2126	10%	680	3	1	43323	0.105	0.57	2593		236	2335
9	East Verdi On	4252	2126	10%	880	2	1		0.105	0.57		40		2335
10	Mogul Off	4252	2126	10%	1740	2			0.105	0.57				2295
11	Mogul On Acceleration	6378	2126	10%	450	3	1	45193	0.105	0.57	2705		84	2379
12	Mogul On	4252	2126	10%	1600	2	1		0.105	0.57		180		2379
13	West 4th Off	4252	2126	10%	6980	2	1		0.105	0.57		194		2199
14	Robb Drive Off	4356	2178	5%	1500	2			0.08	0.45				2005
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2	55547	0.08	0.45	2000		630	2635
16	Rob Drive On Cont	6534	2178	5%	1200	3	1		0.08	0.45		450		2635
17	West McCarran Off	4356	2178	5%	4470	2			0.08	0.45				2185
18	West McCarran On	4356	2178	5%	2640	2	1	73165	0.08	0.45	2634		910	3095

Table 18: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2023 Mainline AADT	K	Peak Hour Calculated D	DDHV	2023 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	39068	0.105	0.57	2338	92		2338
2	West Verdi Off	4022	2011	10%	2100	2			0.105	0.57				2246
3	West Verdi On	4022	2011	10%	1740	2	1	42209	0.105	0.57	2526		88	2334
4	West Verdi On Cont.	4022	2011	10%	2960	2			0.105	0.57				2334
5	Verdi On	4252	2126	10%	5100	2	1	42481	0.105	0.57	2542	60	19	2353
6	Garson Off	4252	2126	10%	2920	2			0.105	0.57				2293
7	Garson On	4252	2126	10%	4350	2	1		0.105	0.57			175	2468
8	East Verdi On Acceleration	6378	2126	10%	680	3	1	49499	0.105	0.57	2963		236	2704
9	East Verdi On	4252	2126	10%	880	2	1		0.105	0.57		40		2704
10	Mogul Off	4252	2126	10%	1740	2			0.105	0.57				2664
11	Mogul On Acceleration	6378	2126	10%	450	3	1	51369	0.105	0.57	3074		84	2748
12	Mogul On	4252	2126	10%	1600	2	1		0.105	0.57		180		2748
13	West 4th Off	4252	2126	10%	6980	2	1		0.105	0.57		194		2568
14	Robb Drive Off	4356	2178	5%	1500	2			0.08	0.45				2374
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2	61723	0.08	0.45	2222		630	3004
16	Rob Drive On Cont	6534	2178	5%	1200	3	1		0.08	0.45		450		3004
17	West McCarran Off	4356	2178	5%	4470	2			0.08	0.45				2554
18	West McCarran On	4356	2178	5%	2640	2	1	79341	0.08	0.45	2856		910	3464

Table 19: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2023 Mainline AADT	K	Peak Hour Calculated D	DDHV	2023 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	8712	2178	5%	2500	4	2	70565	0.08	0.55	3105	1338		**3710**
2	West McCarran Off	6534	2178	5%	4490	3			0.08	0.55				2372
3	West McCarran On	6534	2178	5%	4300	3	1	52947	0.08	0.55	2330	960	357	2729
4	Robb Drive Off	6534	2178	5%	3300	3			0.08	0.55				1769
5	Robb Drive On, Acceleration	6534	2178	5%	430	3	1		0.08	0.55			110	1879
6	Robb Drive On cont	4356	2178	5%	7200	2			0.105	0.43				1879
7	West 4th Street On, Acceleration	6534	2178	5%	440	3	1		0.105	0.43			130	2009
8	West 4th Street On cont	4356	2178	5%	890	2	1	42593	0.105	0.43	1923	140		2009
9	Exit 7, Mogul Off Ramp	4356	2178	5%	700	2			0.105	0.43				1869
10	Mogul On, Acceleration	6534	2178	5%	160	3	1	40723	0.105	0.43	1839		15	1884
11	Mogul On cont	4356	2178	5%	6840	2	1		0.105	0.43		170		1884
12	Exit 5, East Verdi Off Ramp	4356	2178	5%	5350	2	1		0.105	0.43		190		1714
13	Exit 4, Garson Off Ramp	4356	2178	5%	1480	2			0.105	0.43				1524
14	Garson On, Acceleration	6231	2077	15%	765	3	1		0.105	0.43			75	1599
15	Garson On cont	4154	2077	15%	4100	2	1	33705	0.105	0.43	1522	30		1599
16	Exit 3, Verdi Off Ramp	4154	2077	15%	5430	2	1	33433	0.105	0.43	1509	190		1569
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1		0.105	0.43		4		1379
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2			0.105	0.43				1375
19	West Verdi On Ramp	3930	1965	15%	2500	2	1	32892	0.105	0.43	1485		110	1485

Table 20: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2023 Mainline AADT	K	Peak Hour Calculated D	DDHV	2023 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	8712	2178	5%	2500	4	2	76741	0.08	0.55	3377	1338		**3989**
2	West McCarran Off	6534	2178	5%	4490	3			0.08	0.55				2651
3	West McCarran On	6534	2178	5%	4300	3	1	59123	0.08	0.55	2601	960	357	3008
4	Robb Drive Off	6534	2178	5%	3300	3			0.08	0.55				2048
5	Robb Drive On, Acceleration	6534	2178	5%	430	3	1		0.08	0.55			110	2158
6	Robb Drive On cont	4356	2178	5%	7200	2			0.105	0.43				2158
7	West 4th Street On, Acceleration	6534	2178	5%	440	3	1		0.105	0.43			130	2288
8	West 4th Street On cont	4356	2178	5%	890	2	1	48769	0.105	0.43	2202	140		2288
9	Exit 7, Mogul Off Ramp	4356	2178	5%	700	2			0.105	0.43				2148
10	Mogul On, Acceleration	6534	2178	5%	160	3	1	46899	0.105	0.43	2117		15	2163
11	Mogul On cont	4356	2178	5%	6840	2	1		0.105	0.43		170		2163
12	Exit 5, East Verdi Off Ramp	4356	2178	5%	5350	2	1		0.105	0.43		190		1993
13	Exit 4, Garson Off Ramp	4356	2178	5%	1480	2			0.105	0.43				1803
14	Garson On, Acceleration	6231	2077	15%	765	3	1		0.105	0.43			75	1878
15	Garson On cont	4154	2077	15%	4100	2	1	39881	0.105	0.43	1801	30		1878
16	Exit 3, Verdi Off Ramp	4154	2077	15%	5430	2	1	39609	0.105	0.43	1788	190		1848
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1		0.105	0.43		4		1658
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2			0.105	0.43				1654
19	West Verdi On Ramp	3930	1965	15%	2500	2	1	39068	0.105	0.43	1764		110	1764

Table 21: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2023 Mainline AADT	K	Peak Hour Calculated D	DDHV	2023 Balanced Volumes PM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4356	2178	5%	2640	2	1	86022	0.086	0.5	3699	882		**4533**
2	E.McCarran Off Ramp	4356	2178	5%	2540	2			0.086	0.5				3651
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1		0.086	0.5		903	432	4083
4	Sparks Off Ramp	4356	2178	5%	2000	2		55974	0.086	0.5	2407			3180
5	Sparks On Ramp	4356	2178	5%	1500	2	1		0.086	0.5		820	115	3295
6	Vista Off Ramp	4356	2178	5%	2200	2			0.086	0.5				2475
7	Vista On Ramp	4252	2126	10%	3600	2	1	54008	0.095	0.57	2925		450	2925
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	36520	0.095	0.57	1978	145		2925
9	Lockwood Off Ramp	4252	2126	10%	1800	2			0.095	0.57				2780
10	Lockwood On Ramp	4252	2126	10%	5460	2	1	50528	0.095	0.57	2736	100	20	2800
11	Mustang Off Ramp	4252	2126	10%	3069	2			0.095	0.57				2700
12	Mustang On Ramp	4252	2126	10%	13300	2	1	52964	0.095	0.57	2868		50	2750
13	Mustang On Ramp Cont.	4252	2126	10%	5280	2			0.095	0.57				2750
14	Mustang On Ramp Cont.	4252	2126	10%	4180	2	1		0.095	0.57		52		2750
15	Patrick Off Ramp	4252	2126	10%	2680	2			0.095	0.57				2698
16	Patrick On Ramp	4252	2126	10%	8960	2	1	51167	0.095	0.57	2771	46	22	2720
17	USA Parkway Off Ramp	4252	2126	10%	2220	2			0.093	0.57				2674
18	USA Parkway On Ramp	4022	2011	10%	10560	2		45942	0.093	0.66	2820		**146**	2820
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1		0.093	0.66		16		2820
20	Derby Off Ramp	4022	2011	10%	2020	2			0.093	0.66				2804
21	Derby On Ramp	4022	2011	10%	8980	2	1	49598	0.093	0.66	3044	20	5	2809
22	Orchard Off Ramp	4022	2011	10%	1750	2			0.093	0.66				2789
23	Orchard On Ramp	4022	2011	10%	4320	2	1	45228	0.093	0.66	2776	4	1	2790
24	Painted Rock Off Ramp	4022	2011	10%	1800	2			0.093	0.66				2786
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	45239	0.093	0.66	2777	61	10	2796
26	Wadsworth Off Ramp	4022	2011	10%	2640	2			0.093	0.66				2735
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1	44536	0.093	0.66	2734		15	2750

Table 22: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2023 Mainline AADT	K	Peak Hour Calculated D	DDHV	2023 Balanced Volumes PM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4356	2178	5%	2640	2	1	86022	0.086	0.5	3699	882		**5012**
2	E.McCarran Off Ramp	4356	2178	5%	2540	2			0.086	0.5				4130
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1		0.086	0.5		903	432	4562
4	Sparks Off Ramp	4356	2178	5%	2000	2		64833	0.086	0.5	2788			3659
5	Sparks On Ramp	4356	2178	5%	1500	2	1		0.086	0.5		820	115	3774
6	Vista Off Ramp	4356	2178	5%	2200	2			0.086	0.5				2954
7	Vista On Ramp	4252	2126	10%	3600	2	1	62867	0.095	0.57	3404		450	3404
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	36520	0.095	0.57	1978	145		3404
9	Lockwood Off Ramp	4252	2126	10%	1800	2			0.095	0.57				3259
10	Lockwood On Ramp	4252	2126	10%	5460	2	1	59387	0.095	0.57	3216	100	20	3279
11	Mustang Off Ramp	4252	2126	10%	3069	2			0.095	0.57				3179
12	Mustang On Ramp	4252	2126	10%	13300	2	1	61823	0.095	0.57	3348		50	3229
13	Mustang On Ramp Cont.	4252	2126	10%	5280	2			0.095	0.57				3229
14	Mustang On Ramp Cont.	4252	2126	10%	4180	2	1		0.095	0.57		52		3229
15	Patrick Off Ramp	4252	2126	10%	2680	2			0.095	0.57				3177
16	Patrick On Ramp	4252	2126	10%	8960	2	1	60026	0.095	0.57	3250	**92**	22	3199
17	USA Parkway Off Ramp	4252	2126	10%	2220	2			0.093	0.57				3107
18	USA Parkway On Ramp	4022	2011	10%	10560	2		51917	0.093	0.66	3187		80	3187
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1		0.093	0.66		16		3187
20	Derby Off Ramp	4022	2011	10%	2020	2			0.093	0.66				3171
21	Derby On Ramp	4022	2011	10%	8980	2	1	55573	0.093	0.66	3411	20	5	3176
22	Orchard Off Ramp	4022	2011	10%	1750	2			0.093	0.66				3156
23	Orchard On Ramp	4022	2011	10%	4320	2	1	51203	0.093	0.66	3143	4	1	3157
24	Painted Rock Off Ramp	4022	2011	10%	1800	2			0.093	0.66				3153
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	51214	0.093	0.66	3144	61	10	3163
26	Wadsworth Off Ramp	4022	2011	10%	2640	2			0.093	0.66				3102
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1	50511	0.093	0.66	3100		15	3117

Table 23: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2023 Mainline AADT	K	Peak Hour Calculated D	DDHV	2023 Balanced Volumes AM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	44536	0.093	0.70	2899	13		**2917**
2	Wadsworth Off Ramp	4022	2011	10%	2290	2			0.093	0.70				2904
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	45239	0.093	0.70	2945	2	70	2974
4	Painted Rock Off Ramp	4022	2011	10%	2340	2			0.093	0.70				2972
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	45228	0.093	0.70	2944	0	19	2991
6	Orchard Off Ramp	4022	2011	10%	1710	2			0.093	0.70				2991
7	Orchard On Ramp	4022	2011	10%	8730	2	1	49598	0.093	0.70	3229	4	1	2992
8	Derby Off Ramp	4022	2011	10%	2430	2			0.093	0.70				2988
9	Derby On Ramp	4022	2011	10%	19800	2	1	45942	0.093	0.70	2991	30	3	2991
10	USA Parkway Off Ramp	4022	2011	10%	2800	2			0.093	0.65				2961
11	USA Parkway On Ramp	4356	2178	5%	2150	2	1	51167	0.093	0.65	3093	35	**108**	3069
12	Patrick Off Ramp	4356	2178	5%	890	2			0.095	0.65				3034
13	Patrick On Ramp	4356	2178	5%	3060	2	1	52964	0.095	0.65	3271		60	3094
14	Patrick On Ramp Cont.	4356	2178	5%	5280	2			0.095	0.65				3094
15	Patrick On Ramp Cont.	4356	2178	5%	12032	2	1		0.095	0.65		25		3094
16	Mustang Off Ramp	4356	2178	5%	3080	2			0.095	0.65				3069
17	Mustang On Ramp	4356	2178	5%	6860	2	1	50528	0.095	0.65	3120	14	100	3169
18	Lockwood Off Ramp	4356	2178	5%	1175	2			0.095	0.65				3155
19	Lockwood On Ramp	4356	2178	5%	12400	2	1	54008	0.095	0.65	3335	274	180	3335
20	Vista Off Ramp	4356	2178	5%	2250	2			0.086	0.65				3061
21	Vista On Ramp	6534	2178	5%	350	3	1		0.086	0.65			1050	4111
22	Vista On Ramp Cont	4356	2178	5%	1100	2			0.086	0.65				4111
23	Vista On Ramp Cont	6534	2178	5%	620	3	1		0.086	0.65		150		4111
24	Sparks Off Ramp	4356	2178	5%	3050	2		52154	0.086	0.65	3961			3961
25	Sparks On Ramp	6534	2178	5%	450	3	1		0.086	0.65			1180	5141
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1		0.086	0.65		420		5141
27	McCarran Off Ramp	4356	2178	5%	1375	2			0.086	0.65				4721
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		0.086	0.65			201	4922
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2			0.086	0.65				4922
30	McCarran On Ramp	6534	2178	5%	2640	3	1	86022	0.086	0.65	4809		510	5432

Table 24: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2023 Mainline AADT	K	Peak Hour Calculated D	DDHV	2023 Balanced Volumes AM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	50511	0.093	0.70	3288	13		**3306**
2	Wadsworth Off Ramp	4022	2011	10%	2290	2			0.093	0.70				3293
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	51214	0.093	0.70	3334	2	70	3363
4	Painted Rock Off Ramp	4022	2011	10%	2340	2			0.093	0.70				3361
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	51203	0.093	0.70	3333	0	19	3380
6	Orchard Off Ramp	4022	2011	10%	1710	2			0.093	0.70				3380
7	Orchard On Ramp	4022	2011	10%	8730	2	1	55573	0.093	0.70	3618	4	1	3381
8	Derby Off Ramp	4022	2011	10%	2430	2			0.093	0.70				3377
9	Derby On Ramp	4022	2011	10%	19800	2	1	51917	0.093	0.70	3380	30	3	3380
10	USA Parkway Off Ramp	4022	2011	10%	2800	2			0.093	0.65				3350
11	USA Parkway On Ramp	4356	2178	5%	2150	2	1	60026	0.093	0.65	3629	35	**266**	3616
12	Patrick Off Ramp	4356	2178	5%	890	2			0.095	0.65				3581
13	Patrick On Ramp	4356	2178	5%	3060	2	1	61823	0.095	0.65	3818		60	3641
14	Patrick On Ramp Cont.	4356	2178	5%	5280	2			0.095	0.65				3641
15	Patrick On Ramp Cont.	4356	2178	5%	12032	2	1		0.095	0.65		25		3641
16	Mustang Off Ramp	4356	2178	5%	3080	2			0.095	0.65				3616
17	Mustang On Ramp	4356	2178	5%	6860	2	1	59387	0.095	0.65	3667	14	100	3716
18	Lockwood Off Ramp	4356	2178	5%	1175	2			0.095	0.65				3702
19	Lockwood On Ramp	4356	2178	5%	12400	2	1	62867	0.095	0.65	3882	274	180	3882
20	Vista Off Ramp	4356	2178	5%	2250	2			0.086	0.65				3608
21	Vista On Ramp	6534	2178	5%	350	3	1		0.086	0.65			1050	4658
22	Vista On Ramp Cont	4356	2178	5%	1100	2			0.086	0.65				4658
23	Vista On Ramp Cont	6534	2178	5%	620	3	1		0.086	0.65		150		4658
24	Sparks Off Ramp	4356	2178	5%	3050	2		52154	0.086	0.65	4508			4508
25	Sparks On Ramp	6534	2178	5%	450	3	1		0.086	0.65			1180	5688
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1		0.086	0.65		420		5688
27	McCarran Off Ramp	4356	2178	5%	1375	2			0.086	0.65				5268
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		0.086	0.65			201	5469
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2			0.086	0.65				5469
30	McCarran On Ramp	6534	2178	5%	2640	3	1	86022	0.086	0.65	4809		510	5979

Table 25: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2033 Mainline AADT	K	Peak Hour Calculated D	DDHV	2033 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	33047	0.105	0.57	1978	92		1978
2	West Verdi Off	4022	2011	10%	2100	2			0.105	0.57				1886
3	West Verdi On	4022	2011	10%	1740	2	1	36188	0.105	0.57	2166		88	1974
4	West Verdi On Cont.	4022	2011	10%	2960	2			0.105	0.57				1974
5	Verdi On	4252	2126	10%	5100	2	1	36460	0.105	0.57	2182	60	19	1993
6	Garson Off	4252	2126	10%	2920	2			0.105	0.57				1933
7	Garson On	4252	2126	10%	4350	2	1		0.105	0.57			175	2108
8	East Verdi On Acceleration	6378	2126	10%	680	3	1	43478	0.105	0.57	2602		236	2344
9	East Verdi On	4252	2126	10%	880	2	1		0.105	0.57		40		2344
10	Mogul Off	4252	2126	10%	1740	2			0.105	0.57				2304
11	Mogul On Acceleration	6378	2126	10%	450	3	1	45348	0.105	0.57	2714		84	2388
12	Mogul On	4252	2126	10%	1600	2	1		0.105	0.57		180		2388
13	West 4th Off	4252	2126	10%	6980	2	1		0.105	0.57		194		2208
14	Robb Drive Off	4356	2178	5%	1500	2			0.08	0.45				2014
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2	55702	0.08	0.45	2005		630	2644
16	Rob Drive On Cont	6534	2178	5%	1200	3	1		0.08	0.45		450		2644
17	West McCarran Off	4356	2178	5%	4470	2			0.08	0.45				2194
18	West McCarran On	4356	2178	5%	2640	2	1	73320	0.08	0.45	2640		910	3104

Table 26: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2033 Mainline AADT	K	Peak Hour Calculated D	DDHV	2033 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	44431	0.105	0.57	2659	92		2659
2	West Verdi Off	4022	2011	10%	2100	2			0.105	0.57				2567
3	West Verdi On	4022	2011	10%	1740	2	1	47572	0.105	0.57	2847		88	2655
4	West Verdi On Cont.	4022	2011	10%	2960	2			0.105	0.57				2655
5	Verdi On	4252	2126	10%	5100	2	1	47844	0.105	0.57	2863	60	19	2674
6	Garson Off	4252	2126	10%	2920	2			0.105	0.57				2614
7	Garson On	4252	2126	10%	4350	2	1		0.105	0.57			175	2789
8	East Verdi On Acceleration	6378	2126	10%	680	3	1	54862	0.105	0.57	3283		236	3025
9	East Verdi On	4252	2126	10%	880	2	1		0.105	0.57		40		3025
10	Mogul Off	4252	2126	10%	1740	2			0.105	0.57				2985
11	Mogul On Acceleration	6378	2126	10%	450	3	1	56732	0.105	0.57	3395		84	3069
12	Mogul On	4252	2126	10%	1600	2	1		0.105	0.57		180		3069
13	West 4th Off	4252	2126	10%	6980	2	1		0.105	0.57		194		2889
14	Robb Drive Off	4356	2178	5%	1500	2			0.08	0.45				2695
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2	67086	0.08	0.45	2415		630	3325
16	Rob Drive On Cont	6534	2178	5%	1200	3	1		0.08	0.45		450		3325
17	West McCarran Off	4356	2178	5%	4470	2			0.08	0.45				2875
18	West McCarran On	4356	2178	5%	2640	2	1	84704	0.08	0.45	3049		910	3785

Table 27: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2033 Mainline AADT	K	Peak Hour Calculated D	DDHV	2033 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	8712	2178	5%	2500	4	2	70720	0.08	0.55	3112	1338		**3717**
2	West McCarran Off	6534	2178	5%	4490	3			0.08	0.55				2379
3	West McCarran On	6534	2178	5%	4300	3	1	53102	0.08	0.55	2336	960	357	2736
4	Robb Drive Off	6534	2178	5%	3300	3			0.08	0.55				1776
5	Robb Drive On, Acceleration	6534	2178	5%	430	3	1		0.08	0.55			110	1886
6	Robb Drive On cont	4356	2178	5%	7200	2			0.105	0.43				1886
7	West 4th Street On, Acceleration	6534	2178	5%	440	3	1		0.105	0.43			130	2016
8	West 4th Street On cont	4356	2178	5%	890	2	1	42748	0.105	0.43	1930	140		2016
9	Exit 7, Mogul Off Ramp	4356	2178	5%	700	2			0.105	0.43				1876
10	Mogul On, Acceleration	6534	2178	5%	160	3	1	40878	0.105	0.43	1846		15	1891
11	Mogul On cont	4356	2178	5%	6840	2	1		0.105	0.43		170		1891
12	Exit 5, East Verdi Off Ramp	4356	2178	5%	5350	2	1		0.105	0.43		190		1721
13	Exit 4, Garson Off Ramp	4356	2178	5%	1480	2			0.105	0.43				1531
14	Garson On, Acceleration	6231	2077	15%	765	3	1		0.105	0.43			75	1606
15	Garson On cont	4154	2077	15%	4100	2	1	33860	0.105	0.43	1529	30		1606
16	Exit 3, Verdi Off Ramp	4154	2077	15%	5430	2	1	33588	0.105	0.43	1516	190		1576
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1		0.105	0.43		4		1386
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2			0.105	0.43				1382
19	West Verdi On Ramp	3930	1965	15%	2500	2	1	33047	0.105	0.43	1492		110	1492

Table 28: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2033 Mainline AADT	K	Peak Hour Calculated D	DDHV	2033 Balanced Peak Hour Volume		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	8712	2178	5%	2500	4	2	82104	0.08	0.55	3613	1338		**4231**
2	West McCarran Off	6534	2178	5%	4490	3			0.08	0.55				2893
3	West McCarran On	6534	2178	5%	4300	3	1	64486	0.08	0.55	2837	960	357	3250
4	Robb Drive Off	6534	2178	5%	3300	3			0.08	0.55				2290
5	Robb Drive On, Acceleration	6534	2178	5%	430	3	1		0.08	0.55			110	2400
6	Robb Drive On cont	4356	2178	5%	7200	2			0.105	0.43				2400
7	West 4th Street On, Acceleration	6534	2178	5%	440	3	1		0.105	0.43			130	2530
8	West 4th Street On cont	4356	2178	5%	890	2	1	54132	0.105	0.43	2444	140		2530
9	Exit 7, Mogul Off Ramp	4356	2178	5%	700	2			0.105	0.43				2390
10	Mogul On, Acceleration	6534	2178	5%	160	3	1	52262	0.105	0.43	2360		15	2405
11	Mogul On cont	4356	2178	5%	6840	2	1		0.105	0.43		170		2405
12	Exit 5, East Verdi Off Ramp	4356	2178	5%	5350	2	1		0.105	0.43		190		2235
13	Exit 4, Garson Off Ramp	4356	2178	5%	1480	2			0.105	0.43				2045
14	Garson On, Acceleration	6231	2077	15%	765	3	1		0.105	0.43			75	2120
15	Garson On cont	4154	2077	15%	4100	2	1	45244	0.105	0.43	2043	30		2120
16	Exit 3, Verdi Off Ramp	4154	2077	15%	5430	2	1	44972	0.105	0.43	2030	190		2090
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1		0.105	0.43		4		1900
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2			0.105	0.43				1896
19	West Verdi On Ramp	3930	1965	15%	2500	2	1	44431	0.105	0.43	2006		110	2006

Table 29: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2033 Mainline AADT	K	Peak Hour Calculated D	DDHV	2033 Balanced Volumes PM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4356	2178	5%	2640	2	1	86022	0.086	0.5	3699	882		**5419**
2	E.McCarran Off Ramp	4356	2178	5%	2540	2			0.086	0.5				4537
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1		0.086	0.5		903	432	4969
4	Sparks Off Ramp	4356	2178	5%	2000	2		81260	0.086	0.5	3494			4066
5	Sparks On Ramp	4356	2178	5%	1500	2	1		0.086	0.5		820	115	4181
6	Vista Off Ramp	4356	2178	5%	2200	2			0.086	0.5				3361
7	Vista On Ramp	4252	2126	10%	3600	2	1	70376	0.095	0.57	3811		450	3811
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	36520	0.095	0.57		145		3811
9	Lockwood Off Ramp	4252	2126	10%	1800	2			0.095	0.57				3666
10	Lockwood On Ramp	4252	2126	10%	5460	2	1	66896	0.095	0.57	3622	100	20	3686
11	Mustang Off Ramp	4252	2126	10%	3069	2			0.095	0.57				3586
12	Mustang On Ramp	4252	2126	10%	13300	2	1	69332	0.095	0.57	3754		50	3636
13	Mustang On Ramp Cont.	4252	2126	10%	5280	2			0.095	0.57				3636
14	Mustang On Ramp Cont.	4252	2126	10%	4180	2	1		0.095	0.57		52		3636
15	Patrick Off Ramp	4252	2126	10%	2680	2			0.095	0.57				3584
16	Patrick On Ramp	4252	2126	10%	8960	2	1	67535	0.095	0.57	3657	46	22	3606
17	USA Parkway Off Ramp	4252	2126	10%	2220	2			0.093	0.57				3560
18	USA Parkway On Ramp	4022	2011	10%	10560	2		61093	0.093	0.66	3750		**190**	3750
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1		0.093	0.66		16		3750
20	Derby Off Ramp	4022	2011	10%	2020	2			0.093	0.66				3734
21	Derby On Ramp	4022	2011	10%	8980	2	1	64749	0.093	0.66	3974	20	5	3739
22	Orchard Off Ramp	4022	2011	10%	1750	2			0.093	0.66				3719
23	Orchard On Ramp	4022	2011	10%	4320	2	1	60379	0.093	0.66	3706	4	1	3720
24	Painted Rock Off Ramp	4022	2011	10%	1800	2			0.093	0.66				3716
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	60390	0.093	0.66	3707	61	10	3726
26	Wadsworth Off Ramp	4022	2011	10%	2640	2			0.093	0.66				3665
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1	59687	0.093	0.66	3664		15	3680

Table 30: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2033 Mainline AADT	K	Peak Hour Calculated D	DDHV	2033 Balanced Volumes PM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4356	2178	5%	2640	2	1	203021	0.086	0.5	8730	882		**6766**
2	E.McCarran Off Ramp	4356	2178	5%	2540	2			0.086	0.5				5884
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1		0.086	0.5		903	432	6316
4	Sparks Off Ramp	4356	2178	5%	2000	2		106133	0.086	0.5	4564			5413
5	Sparks On Ramp	4356	2178	5%	1500	2	1		0.086	0.5		820	115	5528
6	Vista Off Ramp	4356	2178	5%	2200	2			0.086	0.5				4708
7	Vista On Ramp	4252	2126	10%	3600	2	1	95249	0.095	0.57	5158		450	5158
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	36520	0.095	0.57		145		5158
9	Lockwood Off Ramp	4252	2126	10%	1800	2			0.095	0.57				5013
10	Lockwood On Ramp	4252	2126	10%	5460	2	1	91769	0.095	0.57	4969	100	20	5033
11	Mustang Off Ramp	4252	2126	10%	3069	2			0.095	0.57				4933
12	Mustang On Ramp	4252	2126	10%	13300	2	1	94205	0.095	0.57	5101		50	4983
13	Mustang On Ramp Cont.	4252	2126	10%	5280	2			0.095	0.57				4983
14	Mustang On Ramp Cont.	4252	2126	10%	4180	2	1		0.095	0.57		52		4983
15	Patrick Off Ramp	4252	2126	10%	2680	2			0.095	0.57				4931
16	Patrick On Ramp	4252	2126	10%	8960	2	1	92408	0.095	0.57	5004	**83**	22	4953
17	USA Parkway Off Ramp	4252	2126	10%	2220	2			0.093	0.57				4870
18	USA Parkway On Ramp	4022	2011	10%	10560	2		80648	0.093	0.66	4950		80	4950
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1		0.093	0.66		16		4950
20	Derby Off Ramp	4022	2011	10%	2020	2			0.093	0.66				4934
21	Derby On Ramp	4022	2011	10%	8980	2	1	84304	0.093	0.66	5175	20	5	4939
22	Orchard Off Ramp	4022	2011	10%	1750	2			0.093	0.66				4919
23	Orchard On Ramp	4022	2011	10%	4320	2	1	79934	0.093	0.66	4906	4	1	4920
24	Painted Rock Off Ramp	4022	2011	10%	1800	2			0.093	0.66				4916
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	79945	0.093	0.66	4907	61	10	4926
26	Wadsworth Off Ramp	4022	2011	10%	2640	2			0.093	0.66				4865
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1	79242	0.093	0.66	4864		15	4880

Table 31: Background Traffic Input Parameters Calculations - Lowest Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2033 Mainline AADT	K	Peak Hour Calculated D	DDHV	2033 Balanced Volumes AM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	59687	0.093	0.70	3886	13		**3903**
2	Wadsworth Off Ramp	4022	2011	10%	2290	2			0.093	0.70				3890
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	60390	0.093	0.70	3931	2	70	3960
4	Painted Rock Off Ramp	4022	2011	10%	2340	2			0.093	0.70				3958
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	60379	0.093	0.70	3931	0	19	3977
6	Orchard Off Ramp	4022	2011	10%	1710	2			0.093	0.70				3977
7	Orchard On Ramp	4022	2011	10%	8730	2	1	64749	0.093	0.70	4215	4	1	3978
8	Derby Off Ramp	4022	2011	10%	2430	2			0.093	0.70				3974
9	Derby On Ramp	4022	2011	10%	19800	2	1	61093	0.093	0.70	3977	30	3	3977
10	USA Parkway Off Ramp	4022	2011	10%	2800	2			0.093	0.65				3947
11	USA Parkway On Ramp	4356	2178	5%	2150	2	1	67535	0.093	0.65	4082	35	**233**	4180
12	Patrick Off Ramp	4356	2178	5%	890	2			0.095	0.65				4145
13	Patrick On Ramp	4356	2178	5%	3060	2	1	69332	0.095	0.65	4281		60	4205
14	Patrick On Ramp Cont.	4356	2178	5%	5280	2			0.095	0.65				4205
15	Patrick On Ramp Cont.	4356	2178	5%	12032	2	1		0.095	0.65		25		4205
16	Mustang Off Ramp	4356	2178	5%	3080	2			0.095	0.65				4180
17	Mustang On Ramp	4356	2178	5%	6860	2	1	66896	0.095	0.65	4131	14	100	4280
18	Lockwood Off Ramp	4356	2178	5%	1175	2			0.095	0.65				4266
19	Lockwood On Ramp	4356	2178	5%	12400	2	1	70376	0.095	0.65	4346	274	80	4346
20	Vista Off Ramp	4356	2178	5%	2250	2			0.086	0.65				4072
21	Vista On Ramp	6534	2178	5%	350	3	1		0.086	0.65			1050	5122
22	Vista On Ramp Cont	4356	2178	5%	1100	2			0.086	0.65				5122
23	Vista On Ramp Cont	6534	2178	5%	620	3	1		0.086	0.65		150		5122
24	Sparks Off Ramp	4356	2178	5%	3050	2		81260	0.086	0.65	4542			4972
25	Sparks On Ramp	6534	2178	5%	450	3	1		0.086	0.65			1180	6152
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1		0.086	0.65		420		6152
27	McCarran Off Ramp	4356	2178	5%	1375	2			0.086	0.65				5732
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		0.086	0.65			201	5933
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2			0.086	0.65				5933
30	McCarran On Ramp	6534	2178	5%	2640	3	1	86022	0.086	0.65	4809		510	6443

Table 32: Background Traffic Input Parameters Calculations - Highest Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	2033 Mainline AADT	K	Peak Hour Calculated D	DDHV	2033 Balanced Volumes AM		
												Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	79242	0.093	0.70	5159	13		**5176**
2	Wadsworth Off Ramp	4022	2011	10%	2290	2			0.093	0.70				5163
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	79945	0.093	0.70	5204	2	70	5233
4	Painted Rock Off Ramp	4022	2011	10%	2340	2			0.093	0.70				5231
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	79934	0.093	0.70	5204	0	19	5250
6	Orchard Off Ramp	4022	2011	10%	1710	2			0.093	0.70				5250
7	Orchard On Ramp	4022	2011	10%	8730	2	1	84304	0.093	0.70	5488	4	1	5251
8	Derby Off Ramp	4022	2011	10%	2430	2			0.093	0.70				5247
9	Derby On Ramp	4022	2011	10%	19800	2	1	80648	0.093	0.70	5250	30	3	5250
10	USA Parkway Off Ramp	4022	2011	10%	2800	2			0.093	0.65				5220
11	USA Parkway On Ramp	4356	2178	5%	2150	2	1	92408	0.093	0.65	5586	35	**496**	5716
12	Patrick Off Ramp	4356	2178	5%	890	2			0.095	0.65				5681
13	Patrick On Ramp	4356	2178	5%	3060	2	1	94205	0.095	0.65	5817		60	5741
14	Patrick On Ramp Cont.	4356	2178	5%	5280	2			0.095	0.65				5741
15	Patrick On Ramp Cont.	4356	2178	5%	12032	2	1		0.095	0.65		25		5741
16	Mustang Off Ramp	4356	2178	5%	3080	2			0.095	0.65				5716
17	Mustang On Ramp	4356	2178	5%	6860	2	1	91769	0.095	0.65	5667	14	100	5816
18	Lockwood Off Ramp	4356	2178	5%	1175	2			0.095	0.65				5802
19	Lockwood On Ramp	4356	2178	5%	12400	2	1	95249	0.095	0.65	5882	274	80	5882
20	Vista Off Ramp	4356	2178	5%	2250	2			0.086	0.65				5608
21	Vista On Ramp	6534	2178	5%	350	3	1		0.086	0.65			1050	6658
22	Vista On Ramp Cont	4356	2178	5%	1100	2			0.086	0.65				6658
23	Vista On Ramp Cont	6534	2178	5%	620	3	1		0.086	0.65		150		6658
24	Sparks Off Ramp	4356	2178	5%	3050	2		106133	0.086	0.65	5933			6508
25	Sparks On Ramp	6534	2178	5%	450	3	1		0.086	0.65			1180	7688
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1		0.086	0.65		420		7688
27	McCarran Off Ramp	4356	2178	5%	1375	2			0.086	0.65				7268
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		0.086	0.65			201	7469
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2			0.086	0.65				7469
30	McCarran On Ramp	6534	2178	5%	2640	3	1	203021	0.086	0.65	11349		510	7979

APPENDIX 3-C

Table 1: I 80 WEST Eastbound **FREQ12 Output Summary**

Sub Section Number	Subsection Description	Lowest Estimate				Highest Estimate			
		2 year	7 year	15 year	25 year	2 year	7 year	15 year	25 year
1	Beginning Segment	B	B	B	B	B	B	B	C
2	West Verdi Off	B	B	B	B	B	B	B	C
3	West Verdi On	B	B	B	B	B	B	B	C
4	West Verdi On Cont.	B	B	B	B	B	B	B	C
5	Verdi On	B	B	B	B	B	B	C	C
6	Garson Off	B	B	B	B	B	B	B	C
7	Garson On	B	B	B	B	B	B	C	C
8	East Verdi On Acceleration	B	B	B	B	B	B	B	B
9	East Verdi On	B	B	B	C	B	C	C	C
10	Mogul Off	B	B	B	B	B	C	C	C
11	Mogul On Acceleration	B	B	B	B	B	B	B	B
12	Mogul On	B	B	C	C	B	C	C	C
13	West 4th Off	B	B	B	B	B	B	C	C
14	Robb Drive Off	B	B	B	B	B	B	C	C
15	Robb Drive On Acceleration	A	A	A	A	A	A	B	B
16	Rob Drive On Cont	B	B	B	B	B	B	B	B
17	West McCarran Off	B	B	B	B	B	B	C	C
18	West McCarran On	C	C	C	C	C	C	D	D

Table 2: I 80 WEST Westbound **FREQ12 Output Summary**

Sub Section Number	Subsection Description	Lowest Estimate				Highest Estimate			
		2 year	7 year	15 year	25 year	2 year	7 year	15 year	25 year
1	Beginning Segment	D	D	D	D	D	D	D	E
2	West McCarran Off	B	B	C	C	B	C	C	C
3	West McCarran On	C	C	C	C	C	C	C	C
4	Robb Drive Off	B	B	B	B	B	B	B	B
5	Robb Drive On, Acceleration	A	A	A	A	A	A	B	B
6	Robb Drive On cont	B	B	B	B	B	B	B	C
7	West 4th Street On, Acceleration	A	A	A	A	A	A	B	B
8	West 4th Street On cont	B	B	B	B	B	B	B	C
9	Exit 7, Mogul Off Ramp	B	B	B	B	B	B	B	C
10	Mogul On, Acceleration	A	A	A	A	A	A	B	B
11	Mogul On cont	B	B	B	B	B	B	B	C
12	Exit 5, East Verdi Off Ramp	B	B	B	B	B	B	B	B
13	Exit 4, Garson Off Ramp	A	B	B	B	B	B	B	B
14	Garson On, Acceleration	A	A	A	A	A	A	A	A
15	Garson On cont	B	B	B	B	B	B	B	B
16	Exit 3, Verdi Off Ramp	B	B	B	B	B	B	B	B
17	Exit 2, West Verdi Off	A	A	A	A	A	B	B	B
18	Exit 1, West Verdi Off	A	A	A	A	A	B	B	B
19	West Verdi On Ramp	A	A	B	B	B	B	B	B

Table 3: I 80 EAST Eastbound **FREQ12 Output Summary**

Sub Section Number	Subsection Description	Lowest Estimate				Highest Estimate			
		2 year	7 year	15 year	25 year	2 year	7 year	15 year	25 year
1	Beginning Segment	C	C	C	F	C	C	F	F
2	E.McCarran Off Ramp	C	C	D	F	C	C	F	F
3	E.McCarran On Ramp	C	D	E	E	C	D	E	E
4	Sparks Off Ramp	B	C	C	D	B	C	D	D
5	Sparks On Ramp	C	C	C	D	C	C	D	D
6	Vista Off Ramp	B	B	C	C	B	B	C	C
7	Vista On Ramp	B	B	C	D	B	C	C	D
8	Vista On Ramp Cont	B	B	C	D	B	C	C	D
9	Lockwood Off Ramp	B	B	C	C	B	B	C	D
10	Lockwood On Ramp	B	B	C	C	B	C	C	D
11	Mustang Off Ramp	B	B	C	C	B	B	C	C
12	Mustang On Ramp	B	B	C	C	B	B	C	D
13	Mustang On Ramp Cont.	B	B	C	C	B	B	C	D
14	Mustang On Ramp Cont.	B	B	C	C	B	B	C	D
15	Patrick Off Ramp	B	B	C	C	B	B	C	D
16	Patrick On Ramp Cont.	B	B	C	C	B	B	C	D
17	USA Parkway Off Ramp	B	B	C	C	B	B	C	C
18	USA Parkway On Ramp	B	B	C	C	B	B	C	D
19	USA Parkway On Ramp Cont.	B	B	C	D	B	B	C	D
20	Derby Off Ramp	B	B	C	D	B	B	C	D
21	Derby On Ramp	B	B	C	D	B	B	C	D
22	Orchard Off Ramp	B	B	C	C	B	B	C	D
23	Orchard On Ramp	B	B	C	C	B	B	C	D
24	Painted Rock Off Ramp	B	B	C	C	B	B	C	D
25	Painted Rock On Ramp	B	B	C	C	B	B	C	D
26	Wadsworth Off Ramp	B	B	C	C	B	B	C	D
27	Wadsworth On Ramp	B	B	C	C	B	B	C	D

Table 4: I 80 EAST Westbound **FREQ12 Output Summary**

Sub Section Number	Subsection Description	Lowest Estimate				Highest Estimate			
		2 year	7 year	15 year	25 year	2 year	7 year	15 year	25 year
1	Beginning Segment	B	B	C	E	B	C	D	F
2	Wadsworth Off Ramp	B	B	C	E	B	B	D	F
3	Wadsworth On Ramp	B	B	C	E	B	C	D	E
4	Painted Rock Off Ramp	B	B	C	E	B	C	D	F
5	Painted Rock On Ramp	B	B	C	E	B	C	D	E
6	Orchard Off Ramp	B	B	C	E	B	C	D	E
7	Orchard On Ramp	B	B	C	E	B	C	D	E
8	Derby Off Ramp	B	B	C	E	B	C	D	E
9	Derby On Ramp	B	B	C	E	B	C	D	F
10	USA Parkway Off Ramp	B	B	C	E	B	C	D	F
11	USA Parkway On Ramp	B	C	C	E	B	C	D	F
12	Patrick Off Ramp	B	B	C	E	B	C	D	F
13	Patrick On Ramp	B	C	C	E	B	C	D	E
14	Patrick On Ramp Cont.	B	C	C	E	B	C	D	E
15	Patrick On Ramp Cont.	B	C	C	F	B	C	D	F
16	Mustang Off Ramp	B	C	C	F	B	C	D	F
17	Mustang On Ramp	B	C	C	F	B	C	F	F
18	Lockwood Off Ramp	B	C	C	F	B	C	F	F
19	Lockwood On Ramp	B	C	F	F	B	C	F	F
20	Vista Off Ramp	B	C	F	F	B	C	F	F
21	Vista On Ramp	B	B	F	F	B	F	F	F
22	Vista On Ramp Cont	C	D	F	F	C	F	F	F
23	Vista On Ramp Cont	B	B	F	F	B	F	F	F
24	Sparks Off Ramp	C	F	F	F	C	F	F	F
25	Sparks On Ramp	C	F	F	F	C	F	F	F
26	Sparks On Ramp Cont.	E	E	E	E	E	E	E	E
27	McCarran Off Ramp	D	D	D	E	D	D	D	E
28	McCarran On Loop Ramp	C	C	C	C	C	C	C	C
29	McCarran On Loop Ramp Cont.	D	E	E	E	D	E	E	E
30	McCarran On Ramp	C	C	C	C	C	C	C	C

Background I-80 West Eastbound 2010 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	1824.	92.	1824.	1824.	92.	1824.	4022.	0.	0.	0.	.45	65.	14.0	B	26.7	13.7
2	2	2100.	0.	0.	1732.	0.	0.	1732.	4022.	0.	0.	0.	.43	65.	13.3	B	26.7	13.7
3	2	1740.	89.	0.	1821.	89.	0.	1821.	4022.	0.	0.	0.	.45	65.	14.0	B	26.7	13.7
4	2	2960.	0.	0.	1821.	0.	0.	1821.	4022.	0.	0.	0.	.45	65.	14.0	B	14.2	13.7
5	2	5100.	19.	61.	1840.	19.	61.	1840.	4022.	0.	0.	0.	.46	65.	14.2	B	23.0	13.7
6	2	2920.	0.	0.	1779.	0.	0.	1779.	4022.	0.	0.	0.	.44	65.	13.7	B	23.0	13.7
7	2	4350.	175.	0.	1954.	175.	0.	1954.	4022.	0.	0.	0.	.49	65.	15.0	B	20.0	13.7
8	3	680.	236.	0.	2190.	236.	0.	2190.	6033.	0.	0.	0.	.36	65.	11.2	B	23.0	13.7
9	2	880.	0.	40.	2190.	0.	40.	2190.	4022.	0.	0.	0.	.54	65.	16.8	B	23.0	13.7
10	2	1740.	0.	0.	2150.	0.	0.	2150.	4022.	0.	0.	0.	.53	65.	16.5	B	26.7	13.7
11	3	450.	84.	0.	2234.	84.	0.	2234.	6033.	0.	0.	0.	.37	65.	11.5	B	20.0	13.7
12	2	1600.	0.	181.	2234.	0.	181.	2234.	4022.	0.	0.	0.	.56	65.	17.2	B	20.0	13.7
13	2	6980.	0.	194.	2053.	0.	194.	2053.	4022.	0.	0.	0.	.51	65.	15.8	B	14.2	13.7
14	2	1500.	0.	0.	1859.	0.	0.	1859.	4356.	0.	0.	0.	.43	65.	14.3	B	17.6	13.7
15	4	4000.	630.	0.	2489.	630.	0.	2489.	8712.	0.	0.	0.	.29	65.	9.6	A	23.0	13.7
16	3	1200.	0.	451.	2489.	0.	451.	2489.	6534.	0.	0.	0.	.38	65.	12.8	B	20.0	13.7
17	2	4470.	0.	0.	2038.	0.	0.	2038.	4356.	0.	0.	0.	.47	65.	15.7	B	20.0	13.7
18	2	2640.	910.	2948.	2948.	910.	2948.	2948.	4356.	0.	0.	0.	.68	65.	22.7	C	20.0	13.7
TOTAL		47950. =	9.1 MILES								MAX(V/C) = 0.68		LOWEST LOS = C	AVG = 65.	14.8		19.8	13.7

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	288. VEH-HRS	363. PASS-HRS	288. VEH-HRS	363. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	288. VEH-HRS	363. PASS-HRS	288. VEH-HRS	363. PASS-HRS
TOTAL TRAV DISTANCE =	18708. VEH-MI.	23573. PASS-MI.	18708. VEH-MI.	23573. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	15. VPMPL		15. VPMPL	
TOTAL FUEL =	944. GALLONS		944. GALLONS	
TOTAL EMISSIONS =	257. KILOGRAMS		257. KILOGRAMS	

Background I-80 West Eastbound 2010 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	1921.	92.	1921.	1921.	92.	1921.	4022.	0.	0.	0.	.48	65.	14.8	B	26.7	13.7
2	2	2100.	0.	0.	1829.	0.	0.	1829.	4022.	0.	0.	0.	.45	65.	14.1	B	26.7	13.7
3	2	1740.	87.	0.	1916.	87.	0.	1916.	4022.	0.	0.	0.	.48	65.	14.7	B	26.7	13.7
4	2	2960.	0.	0.	1916.	0.	0.	1916.	4022.	0.	0.	0.	.48	65.	14.7	B	14.2	13.7
5	2	5100.	20.	61.	1936.	20.	61.	1936.	4022.	0.	0.	0.	.48	65.	14.9	B	23.0	13.7
6	2	2920.	0.	0.	1875.	0.	0.	1875.	4022.	0.	0.	0.	.47	65.	14.4	B	23.0	13.7
7	2	4350.	174.	0.	2049.	174.	0.	2049.	4022.	0.	0.	0.	.51	65.	15.8	B	20.0	13.7
8	3	680.	236.	0.	2285.	236.	0.	2285.	6033.	0.	0.	0.	.38	65.	11.7	B	23.0	13.7
9	2	880.	0.	39.	2285.	0.	39.	2285.	4022.	0.	0.	0.	.57	65.	17.6	B	23.0	13.7
10	2	1740.	0.	0.	2246.	0.	0.	2246.	4022.	0.	0.	0.	.56	65.	17.3	B	26.7	13.7
11	3	450.	83.	0.	2329.	83.	0.	2329.	6033.	0.	0.	0.	.39	65.	11.9	B	20.0	13.7
12	2	1600.	0.	178.	2329.	0.	178.	2329.	4022.	0.	0.	0.	.58	65.	17.9	B	20.0	13.7
13	2	6980.	0.	194.	2151.	0.	194.	2151.	4022.	0.	0.	0.	.53	65.	16.5	B	14.2	13.7
14	2	1500.	0.	0.	1957.	0.	0.	1957.	4356.	0.	0.	0.	.45	65.	15.1	B	17.6	13.7
15	4	4000.	630.	0.	2587.	630.	0.	2587.	8712.	0.	0.	0.	.30	65.	9.9	A	23.0	13.7
16	3	1200.	0.	450.	2587.	0.	450.	2587.	6534.	0.	0.	0.	.40	65.	13.3	B	20.0	13.7
17	2	4470.	0.	0.	2137.	0.	0.	2137.	4356.	0.	0.	0.	.49	65.	16.4	B	20.0	13.7
18	2	2640.	910.	3047.	3047.	910.	3047.	3047.	4356.	0.	0.	0.	.70	65.	23.5	C	20.1	13.7
TOTAL		47950. =	9.1 MILES								MAX(V/C) = 0.70		LOWEST LOS = C	AVG = 65.	15.5		19.8	13.7

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	301. VEH-HRS	380. PASS-HRS	301. VEH-HRS	380. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	301. VEH-HRS	380. PASS-HRS	301. VEH-HRS	380. PASS-HRS
TOTAL TRAV DISTANCE =	19588. VEH-MI.	24681. PASS-MI.	19588. VEH-MI.	24681. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	15. VPMPL		15. VPMPL	
TOTAL FUEL =	988. GALLONS		988. GALLONS	
TOTAL EMISSIONS =	269. KILOGRAMS		269. KILOGRAMS	

Background I-80 West Westbound 2010 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	3600.	1338.	3600.	3600.	1338.	3600.	4356.	0.	0.	0.	.83	62.	28.9	D	21.4	12.9
2	2	2640.	0.	0.	2262.	0.	0.	2262.	4356.	0.	0.	0.	.52	65.	17.4	B	20.0	13.7
3	2	4300.	356.	960.	2618.	356.	960.	2618.	4356.	0.	0.	0.	.60	65.	20.1	C	20.0	13.7
4	2	3300.	0.	0.	1658.	0.	0.	1658.	4356.	0.	0.	0.	.38	65.	12.8	B	14.2	13.7
5	3	430.	110.	0.	1768.	110.	0.	1768.	6180.	0.	0.	0.	.29	65.	9.1	A	17.6	13.7
6	2	7200.	0.	0.	1768.	0.	0.	1768.	4120.	0.	0.	0.	.43	65.	13.6	B	26.7	13.7
7	3	440.	131.	0.	1899.	131.	0.	1899.	6180.	0.	0.	0.	.31	65.	9.7	A	20.0	13.7
8	2	890.	0.	141.	1899.	0.	141.	1899.	4120.	0.	0.	0.	.46	65.	14.6	B	20.0	13.7
9	2	700.	0.	0.	1758.	0.	0.	1758.	4120.	0.	0.	0.	.43	65.	13.5	B	14.2	13.7
10	3	160.	15.	0.	1773.	15.	0.	1773.	6180.	0.	0.	0.	.29	65.	9.1	A	14.2	13.7
11	2	6840.	0.	170.	1773.	0.	170.	1773.	4120.	0.	0.	0.	.43	65.	13.6	B	17.6	13.7
12	2	5350.	0.	190.	1603.	0.	190.	1603.	4120.	0.	0.	0.	.39	65.	12.3	B	14.2	13.7
13	2	1480.	0.	0.	1413.	0.	0.	1413.	4120.	0.	0.	0.	.34	65.	10.9	A	17.6	13.7
14	3	765.	76.	0.	1489.	76.	0.	1489.	5895.	0.	0.	0.	.25	65.	7.6	A	17.6	13.7
15	2	4100.	0.	30.	1489.	0.	30.	1489.	3930.	0.	0.	0.	.38	65.	11.5	B	17.6	13.7
16	2	5430.	0.	190.	1459.	0.	190.	1459.	3930.	0.	0.	0.	.37	65.	11.2	B	20.0	13.7
17	2	2590.	0.	3.	1269.	0.	3.	1269.	3930.	0.	0.	0.	.32	65.	9.8	A	15.5	13.7
18	2	1156.	0.	0.	1266.	0.	0.	1266.	3930.	0.	0.	0.	.32	65.	9.7	A	15.5	13.7
19	2	2640.	110.	1376.	1376.	110.	1376.	1376.	3930.	0.	0.	0.	.35	65.	10.6	A	15.5	13.7
TOTAL		53051. =	10.0 MILES										MAX(V/C) = 0.83	LOWEST LOS = D		AVG = 65.	13.8	18.5	13.7

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	281. VEH-HRS	354. PASS-HRS	281. VEH-HRS	354. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	281. VEH-HRS	354. PASS-HRS	281. VEH-HRS	354. PASS-HRS
TOTAL TRAV DISTANCE =	18197. VEH-MI.	22928. PASS-MI.	18197. VEH-MI.	22928. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	14. VPMPL		14. VPMPL	
TOTAL FUEL =	985. GALLONS		985. GALLONS	
TOTAL EMISSIONS =	248. KILOGRAMS		248. KILOGRAMS	

Background I-80 West Westbound 2010 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	3675.	1338.	3675.	3675.	1338.	3675.	4356.	0.	0.	0.	.84	62.	29.8	D	21.7	12.7
2	2	2640.	0.	0.	2337.	0.	0.	2337.	4356.	0.	0.	0.	.54	65.	18.0	B	20.0	13.7
3	2	4300.	356.	960.	2693.	356.	960.	2693.	4356.	0.	0.	0.	.62	65.	20.7	C	20.0	13.7
4	2	3300.	0.	0.	1733.	0.	0.	1733.	4356.	0.	0.	0.	.40	65.	13.3	B	14.2	13.7
5	3	430.	110.	0.	1843.	110.	0.	1843.	6180.	0.	0.	0.	.30	65.	9.5	A	17.6	13.7
6	2	7200.	0.	0.	1843.	0.	0.	1843.	4120.	0.	0.	0.	.45	65.	14.2	B	26.7	13.7
7	3	440.	129.	0.	1972.	129.	0.	1972.	6180.	0.	0.	0.	.32	65.	10.1	A	20.0	13.7
8	2	890.	0.	140.	1972.	0.	140.	1972.	4120.	0.	0.	0.	.48	65.	15.2	B	20.0	13.7
9	2	700.	0.	0.	1832.	0.	0.	1832.	4120.	0.	0.	0.	.44	65.	14.1	B	14.2	13.7
10	3	160.	14.	0.	1846.	14.	0.	1846.	6180.	0.	0.	0.	.30	65.	9.5	A	14.2	13.7
11	2	6840.	0.	169.	1846.	0.	169.	1846.	4120.	0.	0.	0.	.45	65.	14.2	B	17.6	13.7
12	2	5350.	0.	191.	1677.	0.	191.	1677.	4120.	0.	0.	0.	.41	65.	12.9	B	14.2	13.7
13	2	1480.	0.	0.	1486.	0.	0.	1486.	4120.	0.	0.	0.	.36	65.	11.4	B	17.6	13.7
14	3	765.	74.	0.	1560.	74.	0.	1560.	5895.	0.	0.	0.	.26	65.	8.0	A	17.6	13.7
15	2	4100.	0.	30.	1560.	0.	30.	1560.	3930.	0.	0.	0.	.40	65.	12.0	B	17.6	13.7
16	2	5430.	0.	190.	1530.	0.	190.	1530.	3930.	0.	0.	0.	.39	65.	11.8	B	20.0	13.7
17	2	2590.	0.	3.	1340.	0.	3.	1340.	3930.	0.	0.	0.	.34	65.	10.3	A	15.5	13.7
18	2	1156.	0.	0.	1337.	0.	0.	1337.	3930.	0.	0.	0.	.34	65.	10.3	A	15.5	13.7
19	2	2640.	110.	1447.	1447.	110.	1447.	1447.	3930.	0.	0.	0.	.37	65.	11.1	B	15.5	13.7

TOTAL 53051. = 10.0 MILES MAX(V/C) = 0.84 LOWEST LOS = D AVG = 65. 14.4 18.5 13.6

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	293. VEH-HRS	369. PASS-HRS	293. VEH-HRS	369. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	293. VEH-HRS	369. PASS-HRS	293. VEH-HRS	369. PASS-HRS
TOTAL TRAV DISTANCE =	18933. VEH-MI.	23855. PASS-MI.	18933. VEH-MI.	23855. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	14. VPMPL		14. VPMPL	
TOTAL FUEL =	1024. GALLONS		1024. GALLONS	
TOTAL EMISSIONS =	258. KILOGRAMS		258. KILOGRAMS	

Background I-80 East Eastbound 2010 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	3	2640.	3586.	882.	3586.	3586.	882.	3586.	6534.	0.	0.	0.	.55	65.	18.4	C	19.0	14.1
2	2	2540.	0.	0.	2704.	0.	0.	2704.	4356.	0.	0.	0.	.62	65.	20.8	C	19.0	14.1
3	2	3720.	430.	903.	3134.	430.	903.	3134.	4356.	0.	0.	0.	.72	65.	24.3	C	19.2	13.9
4	2	2000.	0.	0.	2231.	0.	0.	2231.	4356.	0.	0.	0.	.51	65.	17.2	B	19.0	14.1
5	2	1500.	116.	819.	2347.	116.	819.	2347.	4356.	0.	0.	0.	.54	65.	18.1	C	19.0	14.1
6	2	2200.	0.	0.	1528.	0.	0.	1528.	4356.	0.	0.	0.	.35	65.	11.8	B	19.0	14.1
7	2	3600.	450.	0.	1978.	450.	0.	1978.	4252.	0.	0.	0.	.47	65.	15.2	B	20.6	14.4
8	2	9304.	0.	145.	1978.	0.	145.	1978.	4252.	0.	0.	0.	.47	65.	15.2	B	18.1	14.4
9	2	1800.	0.	0.	1833.	0.	0.	1833.	4022.	0.	0.	0.	.46	65.	14.1	B	18.1	14.4
10	2	5460.	20.	101.	1853.	20.	101.	1853.	4022.	0.	0.	0.	.46	65.	14.3	B	16.1	14.4
11	2	3069.	0.	0.	1752.	0.	0.	1752.	4022.	0.	0.	0.	.44	70.	12.5	B	16.5	14.8
12	2	13300.	50.	0.	1802.	50.	0.	1802.	4022.	0.	0.	0.	.45	70.	12.9	B	16.5	14.8
13	2	5280.	0.	0.	1802.	0.	0.	1802.	4022.	0.	0.	0.	.45	70.	12.9	B	13.1	14.8
14	2	4180.	0.	52.	1802.	0.	52.	1802.	4022.	0.	0.	0.	.45	70.	12.9	B	18.8	14.8
15	2	2680.	0.	0.	1750.	0.	0.	1750.	4022.	0.	0.	0.	.44	70.	12.5	B	18.8	14.8
16	2	17724.	22.	46.	1772.	22.	46.	1772.	4022.	0.	0.	0.	.44	70.	12.7	B	16.5	14.8
17	2	2220.	0.	0.	1726.	0.	0.	1726.	4022.	0.	0.	0.	.43	70.	12.3	B	16.5	14.8
18	2	10560.	100.	0.	1826.	100.	0.	1826.	4022.	0.	0.	0.	.45	70.	13.0	B	16.5	14.8
19	2	8976.	0.	15.	1826.	0.	15.	1826.	4022.	0.	0.	0.	.45	70.	13.0	B	16.5	14.8
20	2	2020.	0.	0.	1811.	0.	0.	1811.	4022.	0.	0.	0.	.45	70.	12.9	B	16.5	14.8
21	2	8980.	5.	20.	1816.	5.	20.	1816.	4022.	0.	0.	0.	.45	70.	13.0	B	16.5	14.8
22	2	1750.	0.	0.	1796.	0.	0.	1796.	4022.	0.	0.	0.	.45	70.	12.8	B	16.5	14.8
23	2	4320.	1.	3.	1797.	1.	3.	1797.	4022.	0.	0.	0.	.45	70.	12.8	B	16.5	14.8
24	2	1800.	0.	0.	1794.	0.	0.	1794.	4022.	0.	0.	0.	.45	70.	12.8	B	16.5	14.8
25	2	17610.	10.	60.	1804.	10.	60.	1804.	4022.	0.	0.	0.	.45	70.	12.9	B	16.5	14.8
26	2	2640.	0.	0.	1744.	0.	0.	1744.	4022.	0.	0.	0.	.43	70.	12.5	B	16.5	14.8
27	2	2640.	15.	1759.	1759.	15.	1759.	1759.	4022.	0.	0.	0.	.44	70.	12.6	B	16.5	14.8
TOTAL		144513. = 27.4 MILES							MAX(V/C) = 0.72		LOWEST LOS = C			AVG = 68.	13.7		16.9	14.6

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	762. VEH-HRS	960. PASS-HRS	762. VEH-HRS	960. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	762. VEH-HRS	960. PASS-HRS	762. VEH-HRS	960. PASS-HRS
TOTAL TRAV DISTANCE =	52157. VEH-MI.	65718. PASS-MI.	52157. VEH-MI.	65718. PASS-MI.
AVERAGE SYSTEM SPEED =	68. MPH.		68. MPH.	
AVERAGE DENSITY =	14. VPMPL		14. VPMPL	
TOTAL FUEL =	3084. GALLONS		3084. GALLONS	
TOTAL EMISSIONS =	763. KILOGRAMS		763. KILOGRAMS	

Background I-80 East Eastbound 2010 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	3	2640.	3642.	882.	3642.	3642.	882.	3642.	6534.	0.	0.	0.	.56	65.	18.7	C	19.0	14.1
2	2	2540.	0.	0.	2760.	0.	0.	2760.	4356.	0.	0.	0.	.63	65.	21.2	C	19.0	14.1
3	2	3720.	432.	903.	3192.	432.	903.	3192.	4356.	0.	0.	0.	.73	64.	24.8	C	19.2	13.9
4	2	2000.	0.	0.	2289.	0.	0.	2289.	4356.	0.	0.	0.	.53	65.	17.6	B	19.0	14.1
5	2	1500.	116.	820.	2405.	116.	820.	2405.	4356.	0.	0.	0.	.55	65.	18.5	C	19.0	14.1
6	2	2200.	0.	0.	1585.	0.	0.	1585.	4356.	0.	0.	0.	.36	65.	12.2	B	19.0	14.1
7	2	3600.	450.	0.	2035.	450.	0.	2035.	4252.	0.	0.	0.	.48	65.	15.7	B	20.6	14.4
8	2	9304.	0.	145.	2035.	0.	145.	2035.	4252.	0.	0.	0.	.48	65.	15.7	B	18.1	14.4
9	2	1800.	0.	0.	1890.	0.	0.	1890.	4022.	0.	0.	0.	.47	65.	14.5	B	18.1	14.4
10	2	5460.	20.	100.	1910.	20.	100.	1910.	4022.	0.	0.	0.	.47	65.	14.7	B	16.1	14.4
11	2	3069.	0.	0.	1810.	0.	0.	1810.	4022.	0.	0.	0.	.45	70.	12.9	B	16.5	14.8
12	2	13300.	50.	0.	1860.	50.	0.	1860.	4022.	0.	0.	0.	.46	70.	13.3	B	16.5	14.8
13	2	5280.	0.	0.	1860.	0.	0.	1860.	4022.	0.	0.	0.	.46	70.	13.3	B	13.1	14.8
14	2	4180.	0.	52.	1860.	0.	52.	1860.	4022.	0.	0.	0.	.46	70.	13.3	B	18.8	14.8
15	2	2680.	0.	0.	1808.	0.	0.	1808.	4022.	0.	0.	0.	.45	70.	12.9	B	18.8	14.8
16	2	17724.	22.	46.	1830.	22.	46.	1830.	4022.	0.	0.	0.	.45	70.	13.1	B	16.5	14.8
17	2	2220.	0.	0.	1784.	0.	0.	1784.	4022.	0.	0.	0.	.44	70.	12.7	B	16.5	14.8
18	2	10560.	81.	0.	1865.	81.	0.	1865.	4022.	0.	0.	0.	.46	70.	13.3	B	16.5	14.8
19	2	8976.	0.	15.	1865.	0.	15.	1865.	4022.	0.	0.	0.	.46	70.	13.3	B	16.5	14.8
20	2	2020.	0.	0.	1850.	0.	0.	1850.	4022.	0.	0.	0.	.46	70.	13.2	B	16.5	14.8
21	2	8980.	5.	21.	1855.	5.	21.	1855.	4022.	0.	0.	0.	.46	70.	13.3	B	16.5	14.8
22	2	1750.	0.	0.	1834.	0.	0.	1834.	4022.	0.	0.	0.	.46	70.	13.1	B	16.5	14.8
23	2	4320.	1.	3.	1835.	1.	3.	1835.	4022.	0.	0.	0.	.46	70.	13.1	B	16.5	14.8
24	2	1800.	0.	0.	1832.	0.	0.	1832.	4022.	0.	0.	0.	.46	70.	13.1	B	16.5	14.8
25	2	17610.	10.	62.	1842.	10.	62.	1842.	4022.	0.	0.	0.	.46	70.	13.2	B	16.5	14.8
26	2	2640.	0.	0.	1780.	0.	0.	1780.	4022.	0.	0.	0.	.44	70.	12.7	B	16.5	14.8
27	2	2640.	15.	1795.	1795.	15.	1795.	1795.	4022.	0.	0.	0.	.45	70.	12.8	B	16.5	14.8
TOTAL		144513. =	27.4 MILES								MAX(V/C) = 0.73		LOWEST LOS = C	AVG = 68.	14.1		16.9	14.6

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	781. VEH-HRS	985. PASS-HRS	781. VEH-HRS	985. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	781. VEH-HRS	985. PASS-HRS	781. VEH-HRS	985. PASS-HRS
TOTAL TRAV DISTANCE =	53510. VEH-MI.	67422. PASS-MI.	53510. VEH-MI.	67422. PASS-MI.
AVERAGE SYSTEM SPEED =	68. MPH.		68. MPH.	
AVERAGE DENSITY =	14. VPMPL		14. VPMPL	
TOTAL FUEL =	3164. GALLONS		3164. GALLONS	
TOTAL EMISSIONS =	782. KILOGRAMS		782. KILOGRAMS	

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

Background I-80 East Westbound 2010 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	1883.	13.	1883.	1883.	13.	1883.	4022.	0.	0.	0.	.47	65.	14.5	B	20.0	13.7
2	2	2290.	0.	0.	1870.	0.	0.	1870.	4022.	0.	0.	0.	.46	65.	14.4	B	20.0	13.7
3	2	17900.	70.	2.	1940.	70.	2.	1940.	4022.	0.	0.	0.	.48	65.	14.9	B	17.6	13.7
4	2	2340.	0.	0.	1938.	0.	0.	1938.	4022.	0.	0.	0.	.48	65.	14.9	B	17.6	13.7
5	2	4340.	18.	0.	1956.	18.	0.	1956.	4022.	0.	0.	0.	.49	65.	15.0	B	20.0	13.7
6	2	1710.	0.	0.	1956.	0.	0.	1956.	4022.	0.	0.	0.	.49	65.	15.0	B	17.6	13.7
7	2	8730.	1.	4.	1957.	1.	4.	1957.	4022.	0.	0.	0.	.49	65.	15.1	B	20.0	13.7
8	2	2430.	0.	0.	1953.	0.	0.	1953.	4022.	0.	0.	0.	.49	65.	15.0	B	17.6	13.7
9	2	19800.	2.	30.	1955.	2.	30.	1955.	4022.	0.	0.	0.	.49	65.	15.0	B	20.0	13.7
10	2	2800.	0.	0.	1925.	0.	0.	1925.	4022.	0.	0.	0.	.48	65.	14.8	B	17.6	13.7
11	2	23130.	62.	34.	1987.	62.	34.	1987.	4120.	0.	0.	0.	.48	65.	15.3	B	17.6	13.7
12	2	890.	0.	0.	1953.	0.	0.	1953.	4120.	0.	0.	0.	.47	65.	15.0	B	17.6	13.7
13	2	3060.	60.	0.	2013.	60.	0.	2013.	4120.	0.	0.	0.	.49	65.	15.5	B	15.5	13.7
14	2	5280.	0.	0.	2013.	0.	0.	2013.	4120.	0.	0.	0.	.49	65.	15.5	B	23.0	13.7
15	2	12032.	0.	25.	2013.	0.	25.	2013.	4120.	0.	0.	0.	.49	65.	15.5	B	17.6	13.7
16	2	3080.	0.	0.	1988.	0.	0.	1988.	4120.	0.	0.	0.	.48	65.	15.3	B	17.6	13.7
17	2	6860.	100.	13.	2088.	100.	13.	2088.	4120.	0.	0.	0.	.51	65.	16.1	B	20.0	13.7
18	2	1175.	0.	0.	2075.	0.	0.	2075.	4120.	0.	0.	0.	.50	65.	16.0	B	20.0	13.7
19	2	12400.	181.	273.	2256.	181.	273.	2256.	4120.	0.	0.	0.	.55	65.	17.4	B	20.0	13.7
20	2	2250.	0.	0.	1983.	0.	0.	1983.	4356.	0.	0.	0.	.46	65.	15.3	B	23.0	13.7
21	3	350.	1050.	0.	3033.	1050.	0.	3033.	6534.	0.	0.	0.	.46	65.	15.6	B	20.0	13.7
22	2	1100.	0.	0.	3033.	0.	0.	3033.	4356.	0.	0.	0.	.70	65.	23.4	C	20.1	13.7
23	3	620.	0.	151.	3033.	0.	151.	3033.	6534.	0.	0.	0.	.46	65.	15.6	B	20.0	13.7
24	2	3050.	0.	0.	2882.	0.	0.	2882.	4356.	0.	0.	0.	.66	65.	22.2	C	17.6	13.7
25	3	450.	1180.	0.	4062.	1180.	0.	4062.	6534.	0.	0.	0.	.62	65.	20.8	C	20.0	13.7
26	2	2640.	0.	421.	4062.	0.	421.	4062.	4356.	0.	0.	0.	.93	57.	35.5	E	23.6	11.6
27	2	1375.	0.	0.	3641.	0.	0.	3641.	4356.	0.	0.	0.	.84	62.	29.4	D	21.5	12.8
28	3	350.	201.	0.	3842.	201.	0.	3842.	6534.	0.	0.	0.	.59	65.	19.7	C	20.0	13.7
29	2	1400.	0.	0.	3842.	0.	0.	3842.	4356.	0.	0.	0.	.88	60.	32.0	D	22.7	12.2
30	3	2640.	510.	4352.	4352.	510.	4352.	4352.	6534.	0.	0.	0.	.67	65.	22.3	C	20.0	13.7

TOTAL 149112. = 28.2 MILES MAX(V/C) = 0.93 LOWEST LOS = E AVG = 65. 16.4 19.1 13.6

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	942. VEH-HRS	1187. PASS-HRS	942. VEH-HRS	1187. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	942. VEH-HRS	1187. PASS-HRS	942. VEH-HRS	1187. PASS-HRS
TOTAL TRAV DISTANCE =	60823. VEH-MI.	76637. PASS-MI.	60823. VEH-MI.	76637. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	16. VPMPL		16. VPMPL	
TOTAL FUEL =	3193. GALLONS		3193. GALLONS	
TOTAL EMISSIONS =	829. KILOGRAMS		829. KILOGRAMS	

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

Background I-80 East Westbound 2010 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	1902.	13.	1902.	1902.	13.	1902.	4022.	0.	0.	0.	.47	65.	14.6	B	20.0	13.7
2	2	2290.	0.	0.	1889.	0.	0.	1889.	4022.	0.	0.	0.	.47	65.	14.5	B	20.0	13.7
3	2	17900.	70.	2.	1959.	70.	2.	1959.	4022.	0.	0.	0.	.49	65.	15.1	B	17.6	13.7
4	2	2340.	0.	0.	1957.	0.	0.	1957.	4022.	0.	0.	0.	.49	65.	15.1	B	17.6	13.7
5	2	4340.	19.	0.	1976.	19.	0.	1976.	4022.	0.	0.	0.	.49	65.	15.2	B	20.0	13.7
6	2	1710.	0.	0.	1976.	0.	0.	1976.	4022.	0.	0.	0.	.49	65.	15.2	B	17.6	13.7
7	2	8730.	1.	4.	1977.	1.	4.	1977.	4022.	0.	0.	0.	.49	65.	15.2	B	20.0	13.7
8	2	2430.	0.	0.	1973.	0.	0.	1973.	4022.	0.	0.	0.	.49	65.	15.2	B	17.6	13.7
9	2	19800.	2.	30.	1975.	2.	30.	1975.	4022.	0.	0.	0.	.49	65.	15.2	B	20.0	13.7
10	2	2800.	0.	0.	1945.	0.	0.	1945.	4022.	0.	0.	0.	.48	65.	15.0	B	17.6	13.7
11	2	23130.	111.	35.	2056.	111.	35.	2056.	4120.	0.	0.	0.	.50	65.	15.8	B	17.6	13.7
12	2	890.	0.	0.	2021.	0.	0.	2021.	4120.	0.	0.	0.	.49	65.	15.5	B	17.6	13.7
13	2	3060.	60.	0.	2081.	60.	0.	2081.	4120.	0.	0.	0.	.51	65.	16.0	B	15.5	13.7
14	2	5280.	0.	0.	2081.	0.	0.	2081.	4120.	0.	0.	0.	.51	65.	16.0	B	23.0	13.7
15	2	12032.	0.	25.	2081.	0.	25.	2081.	4120.	0.	0.	0.	.51	65.	16.0	B	17.6	13.7
16	2	3080.	0.	0.	2056.	0.	0.	2056.	4120.	0.	0.	0.	.50	65.	15.8	B	17.6	13.7
17	2	6860.	100.	14.	2156.	100.	14.	2156.	4120.	0.	0.	0.	.52	65.	16.6	B	20.0	13.7
18	2	1175.	0.	0.	2142.	0.	0.	2142.	4120.	0.	0.	0.	.52	65.	16.5	B	20.0	13.7
19	2	12400.	180.	274.	2322.	180.	274.	2322.	4120.	0.	0.	0.	.56	65.	17.9	B	20.0	13.7
20	2	2250.	0.	0.	2048.	0.	0.	2048.	4356.	0.	0.	0.	.47	65.	15.8	B	23.0	13.7
21	3	350.	1050.	0.	3098.	1050.	0.	3098.	6534.	0.	0.	0.	.47	65.	15.9	B	20.0	13.7
22	2	1100.	0.	0.	3098.	0.	0.	3098.	4356.	0.	0.	0.	.71	65.	24.0	C	20.2	13.6
23	3	620.	0.	151.	3098.	0.	151.	3098.	6534.	0.	0.	0.	.47	65.	15.9	B	20.0	13.7
24	2	3050.	0.	0.	2947.	0.	0.	2947.	4356.	0.	0.	0.	.68	65.	22.7	C	17.7	13.7
25	3	450.	1180.	0.	4127.	1180.	0.	4127.	6534.	0.	0.	0.	.63	65.	21.2	C	20.0	13.7
26	2	2640.	0.	420.	4127.	0.	420.	4127.	4356.	0.	0.	0.	.95	56.	36.7	E	23.9	11.4
27	2	1375.	0.	0.	3707.	0.	0.	3707.	4356.	0.	0.	0.	.85	61.	30.2	D	21.9	12.6
28	3	350.	201.	0.	3908.	201.	0.	3908.	6534.	0.	0.	0.	.60	65.	20.0	C	20.0	13.7
29	2	1400.	0.	0.	3908.	0.	0.	3908.	4356.	0.	0.	0.	.90	59.	32.9	D	22.9	12.0
30	3	2640.	510.	4418.	4418.	510.	4418.	4418.	6534.	0.	0.	0.	.68	65.	22.7	C	20.0	13.7
TOTAL		149112. =	28.2 MILES								MAX(V/C) = 0.95		LOWEST LOS = E	AVG = 64.	16.7		19.1	13.6

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	963. VEH-HRS	1214. PASS-HRS	963. VEH-HRS	1214. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	963. VEH-HRS	1214. PASS-HRS	963. VEH-HRS	1214. PASS-HRS
TOTAL TRAV DISTANCE =	62139. VEH-MI.	78295. PASS-MI.	62139. VEH-MI.	78295. PASS-MI.
AVERAGE SYSTEM SPEED =	64. MPH.		64. MPH.	
AVERAGE DENSITY =	17. VPMPL		17. VPMPL	
TOTAL FUEL =	3260. GALLONS		3260. GALLONS	
TOTAL EMISSIONS =	846. KILOGRAMS		846. KILOGRAMS	

Background I-80 West Eastbound 2015 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	1897.	92.	1897.	1897.	92.	1897.	4022.	0.	0.	0.	.47	65.	14.6	B	26.7	13.7
2	2	2100.	0.	0.	1805.	0.	0.	1805.	4022.	0.	0.	0.	.45	65.	13.9	B	26.7	13.7
3	2	1740.	89.	0.	1894.	89.	0.	1894.	4022.	0.	0.	0.	.47	65.	14.6	B	26.7	13.7
4	2	2960.	0.	0.	1894.	0.	0.	1894.	4022.	0.	0.	0.	.47	65.	14.6	B	14.2	13.7
5	2	5100.	19.	61.	1913.	19.	61.	1913.	4022.	0.	0.	0.	.48	65.	14.7	B	23.0	13.7
6	2	2920.	0.	0.	1852.	0.	0.	1852.	4022.	0.	0.	0.	.46	65.	14.2	B	23.0	13.7
7	2	4350.	174.	0.	2026.	174.	0.	2026.	4022.	0.	0.	0.	.50	65.	15.6	B	20.0	13.7
8	3	680.	235.	0.	2261.	235.	0.	2261.	6033.	0.	0.	0.	.37	65.	11.6	B	23.0	13.7
9	2	880.	0.	40.	2261.	0.	40.	2261.	4022.	0.	0.	0.	.56	65.	17.4	B	23.0	13.7
10	2	1740.	0.	0.	2221.	0.	0.	2221.	4022.	0.	0.	0.	.55	65.	17.1	B	26.7	13.7
11	3	450.	84.	0.	2305.	84.	0.	2305.	6033.	0.	0.	0.	.38	65.	11.8	B	20.0	13.7
12	2	1600.	0.	180.	2305.	0.	180.	2305.	4022.	0.	0.	0.	.57	65.	17.7	B	20.0	13.7
13	2	6980.	0.	193.	2125.	0.	193.	2125.	4022.	0.	0.	0.	.53	65.	16.3	B	14.2	13.7
14	2	1500.	0.	0.	1932.	0.	0.	1932.	4356.	0.	0.	0.	.44	65.	14.9	B	17.6	13.7
15	4	4000.	630.	0.	2562.	630.	0.	2562.	8712.	0.	0.	0.	.29	65.	9.9	A	23.0	13.7
16	3	1200.	0.	450.	2562.	0.	450.	2562.	6534.	0.	0.	0.	.39	65.	13.1	B	20.0	13.7
17	2	4470.	0.	0.	2112.	0.	0.	2112.	4356.	0.	0.	0.	.48	65.	16.2	B	20.0	13.7
18	2	2640.	910.	3022.	3022.	910.	3022.	3022.	4356.	0.	0.	0.	.69	65.	23.3	C	20.1	13.7
TOTAL		47950. =	9.1 MILES								MAX(V/C) = 0.69		LOWEST LOS = C	AVG = 65.	15.3		19.8	13.7

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	298. VEH-HRS	376. PASS-HRS	298. VEH-HRS	376. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	298. VEH-HRS	376. PASS-HRS	298. VEH-HRS	376. PASS-HRS
TOTAL TRAV DISTANCE =	19369. VEH-MI.	24404. PASS-MI.	19369. VEH-MI.	24404. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	15. VPMPL		15. VPMPL	
TOTAL FUEL =	977. GALLONS		977. GALLONS	
TOTAL EMISSIONS =	266. KILOGRAMS		266. KILOGRAMS	

Background I-80 West Eastbound 2015 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	2082.	92.	2082.	2082.	92.	2082.	4022.	0.	0.	0.	.52	65.	16.0	B	26.7	13.7
2	2	2100.	0.	0.	1990.	0.	0.	1990.	4022.	0.	0.	0.	.49	65.	15.3	B	26.7	13.7
3	2	1740.	89.	0.	2079.	89.	0.	2079.	4022.	0.	0.	0.	.52	65.	16.0	B	26.7	13.7
4	2	2960.	0.	0.	2079.	0.	0.	2079.	4022.	0.	0.	0.	.52	65.	16.0	B	14.2	13.7
5	2	5100.	19.	61.	2098.	19.	61.	2098.	4022.	0.	0.	0.	.52	65.	16.1	B	23.0	13.7
6	2	2920.	0.	0.	2037.	0.	0.	2037.	4022.	0.	0.	0.	.51	65.	15.7	B	23.0	13.7
7	2	4350.	174.	0.	2211.	174.	0.	2211.	4022.	0.	0.	0.	.55	65.	17.0	B	20.0	13.7
8	3	680.	236.	0.	2447.	236.	0.	2447.	6033.	0.	0.	0.	.41	65.	12.5	B	23.0	13.7
9	2	880.	0.	40.	2447.	0.	40.	2447.	4022.	0.	0.	0.	.61	65.	18.8	C	23.0	13.7
10	2	1740.	0.	0.	2407.	0.	0.	2407.	4022.	0.	0.	0.	.60	65.	18.5	C	26.7	13.7
11	3	450.	85.	0.	2492.	85.	0.	2492.	6033.	0.	0.	0.	.41	65.	12.8	B	20.0	13.7
12	2	1600.	0.	179.	2492.	0.	179.	2492.	4022.	0.	0.	0.	.62	65.	19.2	C	20.0	13.7
13	2	6980.	0.	194.	2313.	0.	194.	2313.	4022.	0.	0.	0.	.58	65.	17.8	B	14.2	13.7
14	2	1500.	0.	0.	2119.	0.	0.	2119.	4356.	0.	0.	0.	.49	65.	16.3	B	17.6	13.7
15	4	4000.	630.	0.	2749.	630.	0.	2749.	8712.	0.	0.	0.	.32	65.	10.6	A	23.0	13.7
16	3	1200.	0.	451.	2749.	0.	451.	2749.	6534.	0.	0.	0.	.42	65.	14.1	B	20.0	13.7
17	2	4470.	0.	0.	2298.	0.	0.	2298.	4356.	0.	0.	0.	.53	65.	17.7	B	20.0	13.7
18	2	2640.	910.	3208.	3208.	910.	3208.	3208.	4356.	0.	0.	0.	.74	64.	24.9	C	20.3	13.5
TOTAL		47950. =	9.1 MILES								MAX(V/C) = 0.74		LOWEST LOS = C	AVG = 65.	16.6		19.8	13.7

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	324. VEH-HRS	408. PASS-HRS	324. VEH-HRS	408. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	324. VEH-HRS	408. PASS-HRS	324. VEH-HRS	408. PASS-HRS
TOTAL TRAV DISTANCE =	21058. VEH-MI.	26533. PASS-MI.	21058. VEH-MI.	26533. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	17. VPMPL		17. VPMPL	
TOTAL FUEL =	1061. GALLONS		1061. GALLONS	
TOTAL EMISSIONS =	289. KILOGRAMS		289. KILOGRAMS	

Background I-80 West Westbound 2015 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	3649.	1338.	3649.	3649.	1338.	3649.	4356.	0.	0.	0.	.84	62.	29.5	D	21.6	12.8
2	2	2640.	0.	0.	2311.	0.	0.	2311.	4356.	0.	0.	0.	.53	65.	17.8	B	20.0	13.7
3	2	4300.	356.	960.	2667.	356.	960.	2667.	4356.	0.	0.	0.	.61	65.	20.5	C	20.0	13.7
4	2	3300.	0.	0.	1707.	0.	0.	1707.	4356.	0.	0.	0.	.39	65.	13.1	B	14.2	13.7
5	3	430.	111.	0.	1818.	111.	0.	1818.	6180.	0.	0.	0.	.29	65.	9.3	A	17.6	13.7
6	2	7200.	0.	0.	1818.	0.	0.	1818.	4120.	0.	0.	0.	.44	65.	14.0	B	26.7	13.7
7	3	440.	130.	0.	1948.	130.	0.	1948.	6180.	0.	0.	0.	.32	65.	10.0	A	20.0	13.7
8	2	890.	0.	139.	1948.	0.	139.	1948.	4120.	0.	0.	0.	.47	65.	15.0	B	20.0	13.7
9	2	700.	0.	0.	1809.	0.	0.	1809.	4120.	0.	0.	0.	.44	65.	13.9	B	14.2	13.7
10	3	160.	14.	0.	1823.	14.	0.	1823.	6180.	0.	0.	0.	.29	65.	9.3	A	14.2	13.7
11	2	6840.	0.	170.	1823.	0.	170.	1823.	4120.	0.	0.	0.	.44	65.	14.0	B	17.6	13.7
12	2	5350.	0.	191.	1653.	0.	191.	1653.	4120.	0.	0.	0.	.40	65.	12.7	B	14.2	13.7
13	2	1480.	0.	0.	1462.	0.	0.	1462.	4120.	0.	0.	0.	.35	65.	11.2	B	17.6	13.7
14	3	765.	74.	0.	1536.	74.	0.	1536.	5895.	0.	0.	0.	.26	65.	7.9	A	17.6	13.7
15	2	4100.	0.	29.	1536.	0.	29.	1536.	3930.	0.	0.	0.	.39	65.	11.8	B	17.6	13.7
16	2	5430.	0.	189.	1507.	0.	189.	1507.	3930.	0.	0.	0.	.38	65.	11.6	B	20.0	13.7
17	2	2590.	0.	3.	1318.	0.	3.	1318.	3930.	0.	0.	0.	.34	65.	10.1	A	15.5	13.7
18	2	1156.	0.	0.	1315.	0.	0.	1315.	3930.	0.	0.	0.	.33	65.	10.1	A	15.5	13.7
19	2	2640.	110.	1425.	1425.	110.	1425.	1425.	3930.	0.	0.	0.	.36	65.	11.0	A	15.5	13.7
TOTAL		53051. =	10.0 MILES										MAX(V/C) = 0.84	LOWEST LOS = D		AVG = 65.	14.2	18.5	13.6

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	289. VEH-HRS	364. PASS-HRS	289. VEH-HRS	364. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	289. VEH-HRS	364. PASS-HRS	289. VEH-HRS	364. PASS-HRS
TOTAL TRAV DISTANCE =	18690. VEH-MI.	23550. PASS-MI.	18690. VEH-MI.	23550. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	14. VPMPL		14. VPMPL	
TOTAL FUEL =	1011. GALLONS		1011. GALLONS	
TOTAL EMISSIONS =	255. KILOGRAMS		255. KILOGRAMS	

Background I-80 West Westbound 2015 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	3794.	1338.	3794.	3794.	1338.	3794.	4356.	0.	0.	0.	.87	61.	31.3	D	22.4	12.3
2	2	2640.	0.	0.	2456.	0.	0.	2456.	4356.	0.	0.	0.	.56	65.	18.9	C	20.0	13.7
3	2	4300.	356.	960.	2812.	356.	960.	2812.	4356.	0.	0.	0.	.65	65.	21.6	C	20.0	13.7
4	2	3300.	0.	0.	1852.	0.	0.	1852.	4356.	0.	0.	0.	.43	65.	14.2	B	14.2	13.7
5	3	430.	109.	0.	1961.	109.	0.	1961.	6180.	0.	0.	0.	.32	65.	10.1	A	17.6	13.7
6	2	7200.	0.	0.	1961.	0.	0.	1961.	4120.	0.	0.	0.	.48	65.	15.1	B	26.7	13.7
7	3	440.	130.	0.	2091.	130.	0.	2091.	6180.	0.	0.	0.	.34	65.	10.7	A	20.0	13.7
8	2	890.	0.	140.	2091.	0.	140.	2091.	4120.	0.	0.	0.	.51	65.	16.1	B	20.0	13.7
9	2	700.	0.	0.	1951.	0.	0.	1951.	4120.	0.	0.	0.	.47	65.	15.0	B	14.2	13.7
10	3	160.	14.	0.	1965.	14.	0.	1965.	6180.	0.	0.	0.	.32	65.	10.1	A	14.2	13.7
11	2	6840.	0.	169.	1965.	0.	169.	1965.	4120.	0.	0.	0.	.48	65.	15.1	B	17.6	13.7
12	2	5350.	0.	190.	1796.	0.	190.	1796.	4120.	0.	0.	0.	.44	65.	13.8	B	14.2	13.7
13	2	1480.	0.	0.	1606.	0.	0.	1606.	4120.	0.	0.	0.	.39	65.	12.4	B	17.6	13.7
14	3	765.	74.	0.	1680.	74.	0.	1680.	5895.	0.	0.	0.	.28	65.	8.6	A	17.6	13.7
15	2	4100.	0.	29.	1680.	0.	29.	1680.	3930.	0.	0.	0.	.43	65.	12.9	B	17.6	13.7
16	2	5430.	0.	188.	1651.	0.	188.	1651.	3930.	0.	0.	0.	.42	65.	12.7	B	20.0	13.7
17	2	2590.	0.	3.	1463.	0.	3.	1463.	3930.	0.	0.	0.	.37	65.	11.3	B	15.5	13.7
18	2	1156.	0.	0.	1460.	0.	0.	1460.	3930.	0.	0.	0.	.37	65.	11.2	B	15.5	13.7
19	2	2640.	110.	1570.	1570.	110.	1570.	1570.	3930.	0.	0.	0.	.40	65.	12.1	B	15.5	13.7

TOTAL 53051. = 10.0 MILES MAX(V/C) = 0.87 LOWEST LOS = D AVG = 65. 15.4 18.5 13.6

	CURRENT TIME SLICE				CUMULATIVE VALUES			
FREEWAY TRAVEL TIME =	312.	VEH-HRS	393.	PASS-HRS	312.	VEH-HRS	393.	PASS-HRS
FREEWAY MERGE DELAY =	0.	VEH-HRS	0.	PASS-HRS	0.	VEH-HRS	0.	PASS-HRS
ON-RAMP MRG/CAP DELAY =	0.	VEH-HRS	0.	PASS-HRS	0.	VEH-HRS	0.	PASS-HRS
OFF-RAMP DELAY =	0.	VEH-HRS	0.	PASS-HRS	0.	VEH-HRS	0.	PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	312.	VEH-HRS	393.	PASS-HRS	312.	VEH-HRS	393.	PASS-HRS
TOTAL TRAV DISTANCE =	20135.	VEH-MI.	25370.	PASS-MI.	20135.	VEH-MI.	25370.	PASS-MI.
AVERAGE SYSTEM SPEED =	65.	MPH.			65.	MPH.		
AVERAGE DENSITY =	15.	VPMPL			15.	VPMPL		
TOTAL FUEL =	1088.	GALLONS			1088.	GALLONS		
TOTAL EMISSIONS =	274.	KILOGRAMS			274.	KILOGRAMS		

Background I-80 East Eastbound 2015 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	3	2640.	3922.	882.	3922.	3922.	882.	3922.	6534.	0.	0.	0.	.60	65.	20.1	C	19.0	14.1
2	2	2540.	0.	0.	3040.	0.	0.	3040.	4356.	0.	0.	0.	.70	65.	23.5	C	19.1	14.0
3	2	3720.	432.	903.	3472.	432.	903.	3472.	4356.	0.	0.	0.	.80	63.	27.5	D	19.8	13.5
4	2	2000.	0.	0.	2569.	0.	0.	2569.	4356.	0.	0.	0.	.59	65.	19.8	C	19.0	14.1
5	2	1500.	115.	820.	2684.	115.	820.	2684.	4356.	0.	0.	0.	.62	65.	20.6	C	19.0	14.1
6	2	2200.	0.	0.	1864.	0.	0.	1864.	4356.	0.	0.	0.	.43	65.	14.3	B	19.0	14.1
7	2	3600.	452.	0.	2316.	452.	0.	2316.	4252.	0.	0.	0.	.54	65.	17.8	B	20.6	14.4
8	2	9304.	0.	145.	2316.	0.	145.	2316.	4252.	0.	0.	0.	.54	65.	17.8	B	18.1	14.4
9	2	1800.	0.	0.	2171.	0.	0.	2171.	4022.	0.	0.	0.	.54	65.	16.7	B	18.1	14.4
10	2	5460.	19.	100.	2190.	19.	100.	2190.	4022.	0.	0.	0.	.54	65.	16.8	B	16.1	14.4
11	2	3069.	0.	0.	2090.	0.	0.	2090.	4022.	0.	0.	0.	.52	70.	14.9	B	16.5	14.8
12	2	13300.	49.	0.	2139.	49.	0.	2139.	4022.	0.	0.	0.	.53	70.	15.3	B	16.5	14.8
13	2	5280.	0.	0.	2139.	0.	0.	2139.	4022.	0.	0.	0.	.53	70.	15.3	B	13.1	14.8
14	2	4180.	0.	52.	2139.	0.	52.	2139.	4022.	0.	0.	0.	.53	70.	15.3	B	18.8	14.8
15	2	2680.	0.	0.	2087.	0.	0.	2087.	4022.	0.	0.	0.	.52	70.	14.9	B	18.8	14.8
16	2	17724.	22.	46.	2109.	22.	46.	2109.	4022.	0.	0.	0.	.52	70.	15.1	B	16.5	14.8
17	2	2220.	0.	0.	2063.	0.	0.	2063.	4022.	0.	0.	0.	.51	70.	14.7	B	16.5	14.8
18	2	10560.	124.	0.	2187.	124.	0.	2187.	4022.	0.	0.	0.	.54	70.	15.6	B	16.5	14.8
19	2	8976.	0.	15.	2187.	0.	15.	2187.	4022.	0.	0.	0.	.54	70.	15.6	B	16.5	14.8
20	2	2020.	0.	0.	2172.	0.	0.	2172.	4022.	0.	0.	0.	.54	70.	15.5	B	16.5	14.8
21	2	8980.	5.	20.	2177.	5.	20.	2177.	4022.	0.	0.	0.	.54	70.	15.6	B	16.5	14.8
22	2	1750.	0.	0.	2157.	0.	0.	2157.	4022.	0.	0.	0.	.54	70.	15.4	B	16.5	14.8
23	2	4320.	1.	3.	2158.	1.	3.	2158.	4022.	0.	0.	0.	.54	70.	15.4	B	16.5	14.8
24	2	1800.	0.	0.	2155.	0.	0.	2155.	4022.	0.	0.	0.	.54	70.	15.4	B	16.5	14.8
25	2	17610.	10.	61.	2165.	10.	61.	2165.	4022.	0.	0.	0.	.54	70.	15.5	B	16.5	14.8
26	2	2640.	0.	0.	2104.	0.	0.	2104.	4022.	0.	0.	0.	.52	70.	15.0	B	16.5	14.8
27	2	2640.	15.	2119.	2119.	15.	2119.	2119.	4022.	0.	0.	0.	.53	70.	15.1	B	16.5	14.8
TOTAL		144513. =	27.4 MILES								MAX(V/C) = 0.80		LOWEST LOS = D	AVG = 68.	16.3		16.9	14.6

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	901. VEH-HRS	1135. PASS-HRS	901. VEH-HRS	1135. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	901. VEH-HRS	1135. PASS-HRS	901. VEH-HRS	1135. PASS-HRS
TOTAL TRAV DISTANCE =	61661. VEH-MI.	77693. PASS-MI.	61661. VEH-MI.	77693. PASS-MI.
AVERAGE SYSTEM SPEED =	68. MPH.		68. MPH.	
AVERAGE DENSITY =	16. VPMPL		16. VPMPL	
TOTAL FUEL =	3646. GALLONS		3646. GALLONS	
TOTAL EMISSIONS =	901. KILOGRAMS		901. KILOGRAMS	

Background I-80 East Eastbound 2015 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	3	2640.	4081.	882.	4081.	4081.	882.	4081.	6534.	0.	0.	0.	.62	65.	20.9	C	19.0	14.1
2	2	2540.	0.	0.	3199.	0.	0.	3199.	4356.	0.	0.	0.	.73	64.	24.8	C	19.2	13.9
3	2	3720.	432.	903.	3631.	432.	903.	3631.	4356.	0.	0.	0.	.83	62.	29.2	D	20.3	13.1
4	2	2000.	0.	0.	2728.	0.	0.	2728.	4356.	0.	0.	0.	.63	65.	21.0	C	19.0	14.1
5	2	1500.	115.	820.	2843.	115.	820.	2843.	4356.	0.	0.	0.	.65	65.	21.9	C	19.0	14.1
6	2	2200.	0.	0.	2023.	0.	0.	2023.	4356.	0.	0.	0.	.46	65.	15.6	B	19.0	14.1
7	2	3600.	450.	0.	2473.	450.	0.	2473.	4252.	0.	0.	0.	.58	65.	19.0	C	20.6	14.4
8	2	9304.	0.	145.	2473.	0.	145.	2473.	4252.	0.	0.	0.	.58	65.	19.0	C	18.1	14.4
9	2	1800.	0.	0.	2328.	0.	0.	2328.	4022.	0.	0.	0.	.58	65.	17.9	B	18.1	14.4
10	2	5460.	19.	100.	2347.	19.	100.	2347.	4022.	0.	0.	0.	.58	65.	18.1	C	16.1	14.4
11	2	3069.	0.	0.	2247.	0.	0.	2247.	4022.	0.	0.	0.	.56	70.	16.0	B	16.5	14.8
12	2	13300.	48.	0.	2295.	48.	0.	2295.	4022.	0.	0.	0.	.57	70.	16.4	B	16.5	14.8
13	2	5280.	0.	0.	2295.	0.	0.	2295.	4022.	0.	0.	0.	.57	70.	16.4	B	13.1	14.8
14	2	4180.	0.	52.	2295.	0.	52.	2295.	4022.	0.	0.	0.	.57	70.	16.4	B	18.8	14.8
15	2	2680.	0.	0.	2243.	0.	0.	2243.	4022.	0.	0.	0.	.56	70.	16.0	B	18.8	14.8
16	2	17724.	22.	68.	2265.	22.	68.	2265.	4022.	0.	0.	0.	.56	70.	16.2	B	16.5	14.8
17	2	2220.	0.	0.	2197.	0.	0.	2197.	4022.	0.	0.	0.	.55	70.	15.7	B	16.5	14.8
18	2	10560.	80.	0.	2277.	80.	0.	2277.	4022.	0.	0.	0.	.57	70.	16.3	B	16.5	14.8
19	2	8976.	0.	15.	2277.	0.	15.	2277.	4022.	0.	0.	0.	.57	70.	16.3	B	16.5	14.8
20	2	2020.	0.	0.	2262.	0.	0.	2262.	4022.	0.	0.	0.	.56	70.	16.2	B	16.5	14.8
21	2	8980.	5.	20.	2267.	5.	20.	2267.	4022.	0.	0.	0.	.56	70.	16.2	B	16.5	14.8
22	2	1750.	0.	0.	2247.	0.	0.	2247.	4022.	0.	0.	0.	.56	70.	16.0	B	16.5	14.8
23	2	4320.	1.	4.	2248.	1.	4.	2248.	4022.	0.	0.	0.	.56	70.	16.1	B	16.5	14.8
24	2	1800.	0.	0.	2244.	0.	0.	2244.	4022.	0.	0.	0.	.56	70.	16.0	B	16.5	14.8
25	2	17610.	10.	60.	2254.	10.	60.	2254.	4022.	0.	0.	0.	.56	70.	16.1	B	16.5	14.8
26	2	2640.	0.	0.	2194.	0.	0.	2194.	4022.	0.	0.	0.	.55	70.	15.7	B	16.5	14.8
27	2	2640.	15.	2209.	2209.	15.	2209.	2209.	4022.	0.	0.	0.	.55	70.	15.8	B	16.5	14.8
TOTAL		144513. =	27.4 MILES						MAX(V/C) = 0.83		LOWEST LOS = D			AVG = 68.	17.2		16.9	14.6

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	953. VEH-HRS	1201. PASS-HRS	953. VEH-HRS	1201. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	953. VEH-HRS	1201. PASS-HRS	953. VEH-HRS	1201. PASS-HRS
TOTAL TRAV DISTANCE =	65164. VEH-MI.	82107. PASS-MI.	65164. VEH-MI.	82107. PASS-MI.
AVERAGE SYSTEM SPEED =	68. MPH.		68. MPH.	
AVERAGE DENSITY =	17. VPMPL		17. VPMPL	
TOTAL FUEL =	3849. GALLONS		3849. GALLONS	
TOTAL EMISSIONS =	951. KILOGRAMS		951. KILOGRAMS	

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

Background I-80 East Westbound 2015 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	2251.	13.	2251.	2251.	13.	2251.	4022.	0.	0.	0.	.56	65.	17.3	B	20.0	13.7
2	2	2290.	0.	0.	2238.	0.	0.	2238.	4022.	0.	0.	0.	.56	65.	17.2	B	20.0	13.7
3	2	17900.	70.	2.	2308.	70.	2.	2308.	4022.	0.	0.	0.	.57	65.	17.8	B	17.6	13.7
4	2	2340.	0.	0.	2306.	0.	0.	2306.	4022.	0.	0.	0.	.57	65.	17.7	B	17.6	13.7
5	2	4340.	18.	0.	2324.	18.	0.	2324.	4022.	0.	0.	0.	.58	65.	17.9	B	20.0	13.7
6	2	1710.	0.	0.	2324.	0.	0.	2324.	4022.	0.	0.	0.	.58	65.	17.9	B	17.6	13.7
7	2	8730.	1.	4.	2325.	1.	4.	2325.	4022.	0.	0.	0.	.58	65.	17.9	B	20.0	13.7
8	2	2430.	0.	0.	2321.	0.	0.	2321.	4022.	0.	0.	0.	.58	65.	17.9	B	17.6	13.7
9	2	19800.	2.	30.	2323.	2.	30.	2323.	4022.	0.	0.	0.	.58	65.	17.9	B	20.0	13.7
10	2	2800.	0.	0.	2293.	0.	0.	2293.	4022.	0.	0.	0.	.57	65.	17.6	B	17.6	13.7
11	2	23130.	78.	34.	2371.	78.	34.	2371.	4120.	0.	0.	0.	.58	65.	18.2	C	17.6	13.7
12	2	890.	0.	0.	2337.	0.	0.	2337.	4120.	0.	0.	0.	.57	65.	18.0	B	17.6	13.7
13	2	3060.	60.	0.	2397.	60.	0.	2397.	4120.	0.	0.	0.	.58	65.	18.4	C	15.5	13.7
14	2	5280.	0.	0.	2397.	0.	0.	2397.	4120.	0.	0.	0.	.58	65.	18.4	C	23.0	13.7
15	2	12032.	0.	26.	2397.	0.	26.	2397.	4120.	0.	0.	0.	.58	65.	18.4	C	17.6	13.7
16	2	3080.	0.	0.	2371.	0.	0.	2371.	4120.	0.	0.	0.	.58	65.	18.2	C	17.6	13.7
17	2	6860.	100.	13.	2471.	100.	13.	2471.	4120.	0.	0.	0.	.60	65.	19.0	C	20.0	13.7
18	2	1175.	0.	0.	2458.	0.	0.	2458.	4120.	0.	0.	0.	.60	65.	18.9	C	20.0	13.7
19	2	12400.	181.	274.	2639.	181.	274.	2639.	4120.	0.	0.	0.	.64	65.	20.3	C	20.0	13.7
20	2	2250.	0.	0.	2365.	0.	0.	2365.	4356.	0.	0.	0.	.54	65.	18.2	C	23.0	13.7
21	3	350.	1050.	0.	3415.	1050.	0.	3415.	6534.	0.	0.	0.	.52	65.	17.5	B	20.0	13.7
22	2	1100.	0.	0.	3415.	0.	0.	3415.	4356.	0.	0.	0.	.78	64.	26.9	D	20.7	13.3
23	3	620.	0.	150.	3415.	0.	150.	3415.	6534.	0.	0.	0.	.52	65.	17.5	B	20.0	13.7
24	2	3050.	0.	0.	3265.	0.	0.	3176.	4356.	0.	* 1328.	89.	.73	40.	39.8	F	17.1	14.5
25	3	450.	1180.	0.	4445.	1180.	0.	4356.	6534.	0.	** 450.	89.	.67	11.	127.4	F	14.1	21.1
26	2	2640.	0.	419.	4445.	0.	411.	4356.	4356.	0.	0.	0.	1.00	52.	41.7	E	25.1	11.0
27	2	1375.	0.	0.	4026.	0.	0.	3945.	4356.	0.	0.	0.	.91	59.	33.5	D	23.1	11.9
28	3	350.	201.	0.	4227.	201.	0.	4146.	6534.	0.	0.	0.	.63	65.	21.3	C	20.0	13.7
29	2	1400.	0.	0.	4227.	0.	0.	4146.	4356.	0.	0.	0.	.95	56.	37.0	E	24.0	11.4
30	3	2640.	510.	4737.	4737.	510.	4656.	4656.	6534.	0.	0.	0.	.71	65.	24.0	C	20.2	13.6

TOTAL 149112. = 28.2 MILES MAX(V/C) = 1.00 LOWEST LOS = F AVG = 62. 19.9 19.0 13.6

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	1155. VEH-HRS	1456. PASS-HRS	1155. VEH-HRS	1456. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	1155. VEH-HRS	1456. PASS-HRS	1155. VEH-HRS	1456. PASS-HRS
TOTAL TRAV DISTANCE =	71318. VEH-MI.	89861. PASS-MI.	71318. VEH-MI.	89861. PASS-MI.
AVERAGE SYSTEM SPEED =	62. MPH.		62. MPH.	
AVERAGE DENSITY =	20. VPMPL		20. VPMPL	
TOTAL FUEL =	3746. GALLONS		3746. GALLONS	
TOTAL EMISSIONS =	973. KILOGRAMS		973. KILOGRAMS	

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

Background I-80 East Westbound 2015 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	2343.	13.	2343.	2343.	13.	2343.	4022.	0.	0.	0.	.58	65.	18.0	C	20.0	13.7
2	2	2290.	0.	0.	2330.	0.	0.	2330.	4022.	0.	0.	0.	.58	65.	17.9	B	20.0	13.7
3	2	17900.	71.	2.	2401.	71.	2.	2401.	4022.	0.	0.	0.	.60	65.	18.5	C	17.6	13.7
4	2	2340.	0.	0.	2399.	0.	0.	2399.	4022.	0.	0.	0.	.60	65.	18.5	C	17.6	13.7
5	2	4340.	18.	0.	2417.	18.	0.	2417.	4022.	0.	0.	0.	.60	65.	18.6	C	20.0	13.7
6	2	1710.	0.	0.	2417.	0.	0.	2417.	4022.	0.	0.	0.	.60	65.	18.6	C	17.6	13.7
7	2	8730.	1.	4.	2418.	1.	4.	2418.	4022.	0.	0.	0.	.60	65.	18.6	C	20.0	13.7
8	2	2430.	0.	0.	2414.	0.	0.	2414.	4022.	0.	0.	0.	.60	65.	18.6	C	17.6	13.7
9	2	19800.	2.	30.	2416.	2.	30.	2416.	4022.	0.	0.	0.	.60	65.	18.6	C	20.0	13.7
10	2	2800.	0.	0.	2386.	0.	0.	2386.	4022.	0.	0.	0.	.59	65.	18.4	C	17.6	13.7
11	2	23130.	167.	34.	2553.	167.	34.	2553.	4120.	0.	0.	0.	.62	65.	19.6	C	17.6	13.7
12	2	890.	0.	0.	2519.	0.	0.	2519.	4120.	0.	0.	0.	.61	65.	19.4	C	17.6	13.7
13	2	3060.	60.	0.	2579.	60.	0.	2579.	4120.	0.	0.	0.	.63	65.	19.8	C	15.5	13.7
14	2	5280.	0.	0.	2579.	0.	0.	2579.	4120.	0.	0.	0.	.63	65.	19.8	C	23.0	13.7
15	2	12032.	0.	26.	2579.	0.	26.	2579.	4120.	0.	0.	0.	.63	65.	19.8	C	17.6	13.7
16	2	3080.	0.	0.	2553.	0.	0.	2553.	4120.	0.	0.	0.	.62	65.	19.6	C	17.6	13.7
17	2	6860.	101.	14.	2654.	101.	14.	2654.	4120.	0.	0.	0.	.64	65.	20.4	C	20.0	13.7
18	2	1175.	0.	0.	2640.	0.	0.	2640.	4120.	0.	0.	0.	.64	65.	20.3	C	20.0	13.7
19	2	12400.	180.	275.	2820.	180.	275.	2820.	4120.	0.	0.	0.	.68	65.	21.7	C	20.0	13.7
20	2	2250.	0.	0.	2545.	0.	0.	2545.	4356.	0.	0.	0.	.58	65.	19.6	C	23.0	13.7
21	3	350.	1050.	0.	3595.	1050.	0.	3327.	6534.	0.	* 71.	268.	.51	63.	17.5	F	19.9	13.8
22	2	1100.	0.	0.	3595.	0.	0.	3327.	4356.	0.	** 1100.	268.	.76	46.	36.5	F	20.6	13.6
23	3	620.	0.	151.	3595.	0.	151.	3327.	6534.	0.	** 620.	268.	.51	17.	64.7	F	15.2	17.4
24	2	3050.	0.	0.	3444.	0.	0.	3176.	4356.	0.	** 3050.	268.	.73	17.	94.7	F	14.7	18.1
25	3	450.	1180.	0.	4624.	1180.	0.	4356.	6534.	0.	** 450.	268.	.67	10.	143.3	F	13.5	22.2
26	2	2640.	0.	419.	4624.	0.	395.	4356.	4356.	0.	0.	0.	1.00	52.	41.7	E	25.1	11.0
27	2	1375.	0.	0.	4205.	0.	0.	3961.	4356.	0.	0.	0.	.91	59.	33.8	D	23.1	11.9
28	3	350.	201.	0.	4406.	201.	0.	4162.	6534.	0.	0.	0.	.64	65.	21.3	C	20.0	13.7
29	2	1400.	0.	0.	4406.	0.	0.	4162.	4356.	0.	0.	0.	.96	56.	37.3	E	24.1	11.3
30	3	2640.	510.	4916.	4916.	510.	4672.	4672.	6534.	0.	0.	0.	.72	65.	24.1	C	20.2	13.6

TOTAL 149112. = 28.2 MILES MAX(V/C) = 1.00 LOWEST LOS = F AVG = 58. 22.4 18.9 13.8

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	1304. VEH-HRS	1643. PASS-HRS	1304. VEH-HRS	1643. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	1304. VEH-HRS	1643. PASS-HRS	1304. VEH-HRS	1643. PASS-HRS
TOTAL TRAV DISTANCE =	74962. VEH-MI.	94453. PASS-MI.	74962. VEH-MI.	94453. PASS-MI.
AVERAGE SYSTEM SPEED =	58. MPH.		58. MPH.	
AVERAGE DENSITY =	22. VPMPL		22. VPMPL	
TOTAL FUEL =	3966. GALLONS		3966. GALLONS	
TOTAL EMISSIONS =	1032. KILOGRAMS		1032. KILOGRAMS	

Background I-80 West Eastbound 2023 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	1968.	92.	1968.	1968.	92.	1968.	4022.	0.	0.	0.	.49	65.	15.1	B	26.7	13.7
2	2	2100.	0.	0.	1876.	0.	0.	1876.	4022.	0.	0.	0.	.47	65.	14.4	B	26.7	13.7
3	2	1740.	88.	0.	1964.	88.	0.	1964.	4022.	0.	0.	0.	.49	65.	15.1	B	26.7	13.7
4	2	2960.	0.	0.	1964.	0.	0.	1964.	4022.	0.	0.	0.	.49	65.	15.1	B	14.2	13.7
5	2	5100.	19.	61.	1983.	19.	61.	1983.	4252.	0.	0.	0.	.47	65.	15.3	B	23.0	13.7
6	2	2920.	0.	0.	1922.	0.	0.	1922.	4252.	0.	0.	0.	.45	65.	14.8	B	23.0	13.7
7	2	4350.	175.	0.	2097.	175.	0.	2097.	4252.	0.	0.	0.	.49	65.	16.1	B	20.0	13.7
8	3	680.	236.	0.	2333.	236.	0.	2333.	6378.	0.	0.	0.	.37	65.	12.0	B	23.0	13.7
9	2	880.	0.	39.	2333.	0.	39.	2333.	4252.	0.	0.	0.	.55	65.	17.9	B	23.0	13.7
10	2	1740.	0.	0.	2294.	0.	0.	2294.	4252.	0.	0.	0.	.54	65.	17.6	B	26.7	13.7
11	3	450.	84.	0.	2378.	84.	0.	2378.	6378.	0.	0.	0.	.37	65.	12.2	B	20.0	13.7
12	2	1600.	0.	179.	2378.	0.	179.	2378.	4252.	0.	0.	0.	.56	65.	18.3	C	20.0	13.7
13	2	6980.	0.	194.	2199.	0.	194.	2199.	4252.	0.	0.	0.	.52	65.	16.9	B	14.2	13.7
14	2	1500.	0.	0.	2005.	0.	0.	2005.	4356.	0.	0.	0.	.46	65.	15.4	B	17.6	13.7
15	4	4000.	630.	0.	2635.	630.	0.	2635.	8712.	0.	0.	0.	.30	65.	10.1	A	23.0	13.7
16	3	1200.	0.	450.	2635.	0.	450.	2635.	6534.	0.	0.	0.	.40	65.	13.5	B	20.0	13.7
17	2	4470.	0.	0.	2185.	0.	0.	2185.	4356.	0.	0.	0.	.50	65.	16.8	B	20.0	13.7
18	2	2640.	910.	3095.	3095.	910.	3095.	3095.	4356.	0.	0.	0.	.71	65.	23.9	C	20.2	13.6
TOTAL		47950. =	9.1 MILES								MAX(V/C) = 0.71		LOWEST LOS = C	AVG = 65.	15.8		19.8	13.7

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	308. VEH-HRS	388. PASS-HRS	308. VEH-HRS	388. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	308. VEH-HRS	388. PASS-HRS	308. VEH-HRS	388. PASS-HRS
TOTAL TRAV DISTANCE =	20022. VEH-MI.	25228. PASS-MI.	20022. VEH-MI.	25228. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	16. VPMPL		16. VPMPL	
TOTAL FUEL =	1010. GALLONS		1010. GALLONS	
TOTAL EMISSIONS =	275. KILOGRAMS		275. KILOGRAMS	

Background I-80 West Eastbound 2023 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	2337.	92.	2337.	2337.	92.	2337.	4022.	0.	0.	0.	.58	65.	18.0	B	26.7	13.7
2	2	2100.	0.	0.	2245.	0.	0.	2245.	4022.	0.	0.	0.	.56	65.	17.3	B	26.7	13.7
3	2	1740.	88.	0.	2333.	88.	0.	2333.	4022.	0.	0.	0.	.58	65.	17.9	B	26.7	13.7
4	2	2960.	0.	0.	2333.	0.	0.	2333.	4022.	0.	0.	0.	.58	65.	17.9	B	14.2	13.7
5	2	5100.	17.	59.	2350.	17.	59.	2350.	4252.	0.	0.	0.	.55	65.	18.1	C	23.0	13.7
6	2	2920.	0.	0.	2291.	0.	0.	2291.	4252.	0.	0.	0.	.54	65.	17.6	B	23.0	13.7
7	2	4350.	175.	0.	2466.	175.	0.	2466.	4252.	0.	0.	0.	.58	65.	19.0	C	20.0	13.7
8	3	680.	235.	0.	2701.	235.	0.	2701.	6378.	0.	0.	0.	.42	65.	13.9	B	23.0	13.7
9	2	880.	0.	39.	2701.	0.	39.	2701.	4252.	0.	0.	0.	.64	65.	20.8	C	23.0	13.7
10	2	1740.	0.	0.	2662.	0.	0.	2662.	4252.	0.	0.	0.	.63	65.	20.5	C	26.7	13.7
11	3	450.	85.	0.	2747.	85.	0.	2747.	6378.	0.	0.	0.	.43	65.	14.1	B	20.0	13.7
12	2	1600.	0.	180.	2747.	0.	180.	2747.	4252.	0.	0.	0.	.65	65.	21.1	C	20.0	13.7
13	2	6980.	0.	193.	2567.	0.	193.	2567.	4252.	0.	0.	0.	.60	65.	19.7	C	14.2	13.7
14	2	1500.	0.	0.	2374.	0.	0.	2374.	4356.	0.	0.	0.	.54	65.	18.3	C	17.6	13.7
15	4	4000.	630.	0.	3004.	630.	0.	3004.	8712.	0.	0.	0.	.34	65.	11.6	B	23.0	13.7
16	3	1200.	0.	449.	3004.	0.	449.	3004.	6534.	0.	0.	0.	.46	65.	15.4	B	20.0	13.7
17	2	4470.	0.	0.	2555.	0.	0.	2555.	4356.	0.	0.	0.	.59	65.	19.7	C	20.0	13.7
18	2	2640.	910.	3465.	3465.	910.	3465.	3465.	4356.	0.	0.	0.	.80	63.	27.4	D	20.9	13.2
TOTAL		47950. =	9.1 MILES								MAX(V/C) = 0.80		LOWEST LOS = D	AVG = 65.	18.5		19.9	13.7

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	360. VEH-HRS	454. PASS-HRS	360. VEH-HRS	454. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	360. VEH-HRS	454. PASS-HRS	360. VEH-HRS	454. PASS-HRS
TOTAL TRAV DISTANCE =	23370. VEH-MI.	29447. PASS-MI.	23370. VEH-MI.	29447. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	19. VPMPL		19. VPMPL	
TOTAL FUEL =	1175. GALLONS		1175. GALLONS	
TOTAL EMISSIONS =	320. KILOGRAMS		320. KILOGRAMS	

Background I-80 West Westbound 2023 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	3709.	1338.	3709.	3709.	1338.	3709.	4356.	0.	0.	0.	.85	61.	30.2	D	21.9	12.6
2	2	2640.	0.	0.	2371.	0.	0.	2371.	4356.	0.	0.	0.	.54	65.	18.2	C	20.0	13.7
3	2	4300.	357.	960.	2728.	357.	960.	2728.	4356.	0.	0.	0.	.63	65.	21.0	C	20.0	13.7
4	2	3300.	0.	0.	1768.	0.	0.	1768.	4356.	0.	0.	0.	.41	65.	13.6	B	14.2	13.7
5	3	430.	110.	0.	1878.	110.	0.	1878.	6180.	0.	0.	0.	.30	65.	9.6	A	17.6	13.7
6	2	7200.	0.	0.	1878.	0.	0.	1878.	4120.	0.	0.	0.	.46	65.	14.4	B	26.7	13.7
7	3	440.	130.	0.	2008.	130.	0.	2008.	6180.	0.	0.	0.	.32	65.	10.3	A	20.0	13.7
8	2	890.	0.	140.	2008.	0.	140.	2008.	4120.	0.	0.	0.	.49	65.	15.4	B	20.0	13.7
9	2	700.	0.	0.	1868.	0.	0.	1868.	4120.	0.	0.	0.	.45	65.	14.4	B	14.2	13.7
10	3	160.	14.	0.	1882.	14.	0.	1882.	6180.	0.	0.	0.	.30	65.	9.7	A	14.2	13.7
11	2	6840.	0.	169.	1882.	0.	169.	1882.	4120.	0.	0.	0.	.46	65.	14.5	B	17.6	13.7
12	2	5350.	0.	190.	1713.	0.	190.	1713.	4120.	0.	0.	0.	.42	65.	13.2	B	14.2	13.7
13	2	1480.	0.	0.	1523.	0.	0.	1523.	4120.	0.	0.	0.	.37	65.	11.7	B	17.6	13.7
14	3	765.	74.	0.	1597.	74.	0.	1597.	5895.	0.	0.	0.	.27	65.	8.2	A	17.6	13.7
15	2	4100.	0.	30.	1597.	0.	30.	1597.	3930.	0.	0.	0.	.41	65.	12.3	B	17.6	13.7
16	2	5430.	0.	190.	1567.	0.	190.	1567.	3930.	0.	0.	0.	.40	65.	12.1	B	20.0	13.7
17	2	2590.	0.	3.	1377.	0.	3.	1377.	3930.	0.	0.	0.	.35	65.	10.6	A	15.5	13.7
18	2	1156.	0.	0.	1374.	0.	0.	1374.	3930.	0.	0.	0.	.35	65.	10.6	A	15.5	13.7
19	2	2640.	110.	1484.	1484.	110.	1484.	1484.	3930.	0.	0.	0.	.38	65.	11.4	B	15.5	13.7

TOTAL 53051. = 10.0 MILES MAX(V/C) = 0.85 LOWEST LOS = D AVG = 65. 14.7 18.5 13.6

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	298. VEH-HRS	376. PASS-HRS	298. VEH-HRS	376. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	298. VEH-HRS	376. PASS-HRS	298. VEH-HRS	376. PASS-HRS
TOTAL TRAV DISTANCE =	19293. VEH-MI.	24309. PASS-MI.	19293. VEH-MI.	24309. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	15. VPMPL		15. VPMPL	
TOTAL FUEL =	1044. GALLONS		1044. GALLONS	
TOTAL EMISSIONS =	263. KILOGRAMS		263. KILOGRAMS	

Background I-80 West Westbound 2023 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	3989.	1338.	3989.	3989.	1338.	3989.	4356.	0.	0.	0.	.92	58.	34.2	D	23.3	11.8
2	2	2640.	0.	0.	2651.	0.	0.	2651.	4356.	0.	0.	0.	.61	65.	20.4	C	20.0	13.7
3	2	4300.	357.	960.	3008.	357.	960.	3008.	4356.	0.	0.	0.	.69	65.	23.2	C	20.1	13.7
4	2	3300.	0.	0.	2048.	0.	0.	2048.	4356.	0.	0.	0.	.47	65.	15.8	B	14.2	13.7
5	3	430.	110.	0.	2158.	110.	0.	2158.	6180.	0.	0.	0.	.35	65.	11.1	B	17.6	13.7
6	2	7200.	0.	0.	2158.	0.	0.	2158.	4120.	0.	0.	0.	.52	65.	16.6	B	26.7	13.7
7	3	440.	131.	0.	2289.	131.	0.	2289.	6180.	0.	0.	0.	.37	65.	11.7	B	20.0	13.7
8	2	890.	0.	140.	2289.	0.	140.	2289.	4120.	0.	0.	0.	.56	65.	17.6	B	20.0	13.7
9	2	700.	0.	0.	2149.	0.	0.	2149.	4120.	0.	0.	0.	.52	65.	16.5	B	14.2	13.7
10	3	160.	14.	0.	2163.	14.	0.	2163.	6180.	0.	0.	0.	.35	65.	11.1	B	14.2	13.7
11	2	6840.	0.	170.	2163.	0.	170.	2163.	4120.	0.	0.	0.	.52	65.	16.6	B	17.6	13.7
12	2	5350.	0.	190.	1993.	0.	190.	1993.	4120.	0.	0.	0.	.48	65.	15.3	B	14.2	13.7
13	2	1480.	0.	0.	1803.	0.	0.	1803.	4120.	0.	0.	0.	.44	65.	13.9	B	17.6	13.7
14	3	765.	75.	0.	1878.	75.	0.	1878.	5895.	0.	0.	0.	.32	65.	9.6	A	17.6	13.7
15	2	4100.	0.	30.	1878.	0.	30.	1878.	3930.	0.	0.	0.	.48	65.	14.4	B	17.6	13.7
16	2	5430.	0.	190.	1848.	0.	190.	1848.	3930.	0.	0.	0.	.47	65.	14.2	B	20.0	13.7
17	2	2590.	0.	3.	1658.	0.	3.	1658.	3930.	0.	0.	0.	.42	65.	12.8	B	15.5	13.7
18	2	1156.	0.	0.	1655.	0.	0.	1655.	3930.	0.	0.	0.	.42	65.	12.7	B	15.5	13.7
19	2	2640.	110.	1765.	1765.	110.	1765.	1765.	3930.	0.	0.	0.	.45	65.	13.6	B	15.5	13.7
TOTAL		53051. =	10.0 MILES						MAX(V/C) = 0.92		LOWEST LOS = D			AVG = 64.	16.9		18.5	13.6

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	344. VEH-HRS	433. PASS-HRS	344. VEH-HRS	433. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	344. VEH-HRS	433. PASS-HRS	344. VEH-HRS	433. PASS-HRS
TOTAL TRAV DISTANCE =	22111. VEH-MI.	27860. PASS-MI.	22111. VEH-MI.	27860. PASS-MI.
AVERAGE SYSTEM SPEED =	64. MPH.		64. MPH.	
AVERAGE DENSITY =	17. VPMPL		17. VPMPL	
TOTAL FUEL =	1193. GALLONS		1193. GALLONS	
TOTAL EMISSIONS =	300. KILOGRAMS		300. KILOGRAMS	

Background I-80 East Eastbound 2023 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	3	2640.	4534.	882.	4534.	4534.	882.	4534.	6534.	0.	0.	0.	.69	65.	23.3	C	17.9	14.4
2	2	2540.	0.	0.	3652.	0.	0.	3652.	4356.	0.	0.	0.	.84	62.	29.5	D	19.1	13.4
3	2	3720.	433.	903.	4085.	433.	903.	4085.	4356.	0.	0.	0.	.94	57.	35.9	E	20.7	12.1
4	2	2000.	0.	0.	3182.	0.	0.	3182.	4356.	0.	0.	0.	.73	64.	24.7	C	18.1	14.3
5	2	1500.	115.	821.	3297.	115.	821.	3297.	4356.	0.	0.	0.	.76	64.	25.7	C	18.0	14.2
6	2	2200.	0.	0.	2476.	0.	0.	2476.	4356.	0.	0.	0.	.57	65.	19.0	C	17.7	14.5
7	2	3600.	451.	0.	2927.	451.	0.	2927.	4252.	0.	0.	0.	.69	65.	22.6	C	20.3	14.5
8	2	9304.	0.	145.	2927.	0.	145.	2927.	4252.	0.	0.	0.	.69	65.	22.6	C	17.8	14.5
9	2	1800.	0.	0.	2782.	0.	0.	2782.	4252.	0.	0.	0.	.65	65.	21.4	C	17.7	14.5
10	2	5460.	19.	101.	2801.	19.	101.	2801.	4252.	0.	0.	0.	.66	65.	21.5	C	15.8	14.5
11	2	3069.	0.	0.	2700.	0.	0.	2700.	4252.	0.	0.	0.	.63	70.	19.4	C	16.1	15.0
12	2	13300.	50.	0.	2750.	50.	0.	2750.	4252.	0.	0.	0.	.65	70.	19.7	C	16.1	15.0
13	2	5280.	0.	0.	2750.	0.	0.	2750.	4252.	0.	0.	0.	.65	70.	19.7	C	12.8	15.0
14	2	4180.	0.	51.	2750.	0.	51.	2750.	4252.	0.	0.	0.	.65	70.	19.7	C	18.3	15.0
15	2	2680.	0.	0.	2699.	0.	0.	2699.	4252.	0.	0.	0.	.63	70.	19.4	C	18.3	15.0
16	2	17724.	21.	45.	2720.	21.	45.	2720.	4252.	0.	0.	0.	.64	70.	19.5	C	16.1	15.0
17	2	2220.	0.	0.	2675.	0.	0.	2675.	4252.	0.	0.	0.	.63	70.	19.2	C	16.1	15.0
18	2	10560.	146.	0.	2821.	146.	0.	2821.	4252.	0.	0.	0.	.66	69.	20.3	C	16.1	15.0
19	2	8976.	0.	15.	2821.	0.	15.	2821.	4022.	0.	0.	0.	.70	69.	20.5	C	16.3	14.9
20	2	2020.	0.	0.	2806.	0.	0.	2806.	4022.	0.	0.	0.	.70	69.	20.3	C	16.3	14.9
21	2	8980.	5.	20.	2811.	5.	20.	2811.	4022.	0.	0.	0.	.70	69.	20.4	C	16.3	14.9
22	2	1750.	0.	0.	2791.	0.	0.	2791.	4022.	0.	0.	0.	.69	69.	20.2	C	16.3	14.9
23	2	4320.	1.	4.	2792.	1.	4.	2792.	4022.	0.	0.	0.	.69	69.	20.2	C	16.3	14.9
24	2	1800.	0.	0.	2788.	0.	0.	2788.	4022.	0.	0.	0.	.69	69.	20.2	C	16.3	14.9
25	2	17610.	10.	61.	2798.	10.	61.	2798.	4022.	0.	0.	0.	.70	69.	20.3	C	16.3	14.9
26	2	2640.	0.	0.	2737.	0.	0.	2737.	4022.	0.	0.	0.	.68	69.	19.8	C	16.2	14.9
27	2	2640.	15.	2752.	2752.	15.	2752.	2752.	4022.	0.	0.	0.	.68	69.	19.9	C	16.2	14.9

TOTAL 144513. = 27.4 MILES MAX(V/C) = 0.94 LOWEST LOS = E AVG = 68. 21.0 16.6 14.7

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	1163. VEH-HRS	1465. PASS-HRS	1163. VEH-HRS	1465. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	1163. VEH-HRS	1465. PASS-HRS	1163. VEH-HRS	1465. PASS-HRS
TOTAL TRAV DISTANCE =	78651. VEH-MI.	99100. PASS-MI.	78651. VEH-MI.	99100. PASS-MI.
AVERAGE SYSTEM SPEED =	68. MPH.		68. MPH.	
AVERAGE DENSITY =	21. VPMPL		21. VPMPL	
TOTAL FUEL =	4736. GALLONS		4736. GALLONS	
TOTAL EMISSIONS =	1157. KILOGRAMS		1157. KILOGRAMS	

Background I-80 East Eastbound 2023 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	3	2640.	5012.	882.	5012.	5012.	882.	4805.	6534.	0.	* 2413.	207.	.74	26.	60.5	F	16.1	16.6
2	2	2540.	0.	0.	4130.	0.	0.	3923.	4356.	0.	** 2540.	207.	.90	22.	87.3	F	17.5	15.7
3	2	3720.	433.	903.	4563.	433.	862.	4356.	4356.	0.	0.	0.	1.00	52.	41.7	E	21.8	11.4
4	2	2000.	0.	0.	3660.	0.	0.	3494.	4356.	0.	0.	0.	.80	63.	27.7	D	18.6	13.8
5	2	1500.	115.	820.	3775.	115.	784.	3609.	4356.	0.	0.	0.	.83	62.	29.0	D	18.7	13.5
6	2	2200.	0.	0.	2955.	0.	0.	2825.	4356.	0.	0.	0.	.65	65.	21.7	C	17.7	14.5
7	2	3600.	452.	0.	3407.	452.	0.	3277.	4252.	0.	0.	0.	.77	64.	25.7	C	20.7	14.1
8	2	9304.	0.	145.	3407.	0.	139.	3277.	4252.	0.	0.	0.	.77	64.	25.7	C	18.1	14.1
9	2	1800.	0.	0.	3262.	0.	0.	3138.	4252.	0.	0.	0.	.74	64.	24.4	C	17.9	14.3
10	2	5460.	20.	101.	3282.	20.	97.	3158.	4252.	0.	0.	0.	.74	64.	24.6	C	16.0	14.3
11	2	3069.	0.	0.	3181.	0.	0.	3060.	4252.	0.	0.	0.	.72	69.	22.3	C	16.4	14.9
12	2	13300.	49.	0.	3230.	49.	0.	3109.	4252.	0.	0.	0.	.73	68.	22.8	C	16.5	14.9
13	2	5280.	0.	0.	3230.	0.	0.	3109.	4252.	0.	0.	0.	.73	68.	22.8	C	13.2	14.9
14	2	4180.	0.	52.	3230.	0.	50.	3109.	4252.	0.	0.	0.	.73	68.	22.8	C	18.8	14.9
15	2	2680.	0.	0.	3178.	0.	0.	3059.	4252.	0.	0.	0.	.72	69.	22.3	C	18.7	14.9
16	2	17724.	22.	92.	3200.	22.	89.	3081.	4252.	0.	0.	0.	.72	68.	22.5	C	16.4	14.9
17	2	2220.	0.	0.	3108.	0.	0.	2993.	4252.	0.	0.	0.	.70	69.	21.7	C	16.3	14.9
18	2	10560.	80.	0.	3188.	80.	0.	3073.	4252.	0.	0.	0.	.72	69.	22.4	C	16.4	14.9
19	2	8976.	0.	15.	3188.	0.	14.	3073.	4022.	0.	0.	0.	.76	67.	22.8	C	16.7	14.8
20	2	2020.	0.	0.	3173.	0.	0.	3058.	4022.	0.	0.	0.	.76	68.	22.6	C	16.7	14.8
21	2	8980.	5.	21.	3178.	5.	20.	3063.	4022.	0.	0.	0.	.76	68.	22.7	C	16.7	14.8
22	2	1750.	0.	0.	3157.	0.	0.	3043.	4022.	0.	0.	0.	.76	68.	22.5	C	16.7	14.8
23	2	4320.	1.	4.	3158.	1.	4.	3044.	4022.	0.	0.	0.	.76	68.	22.5	C	16.7	14.8
24	2	1800.	0.	0.	3154.	0.	0.	3040.	4022.	0.	0.	0.	.76	68.	22.5	C	16.7	14.8
25	2	17610.	10.	62.	3164.	10.	60.	3050.	4022.	0.	0.	0.	.76	68.	22.6	C	16.7	14.8
26	2	2640.	0.	0.	3102.	0.	0.	2990.	4022.	0.	0.	0.	.74	68.	22.0	C	16.6	14.8
27	2	2640.	15.	3117.	3117.	15.	3005.	3005.	4022.	0.	0.	0.	.75	68.	22.1	C	16.6	14.8
TOTAL		144513. =	27.4 MILES								MAX(V/C) = 1.00		LOWEST LOS = F	AVG = 61.	25.4		16.9	14.7

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	1423. VEH-HRS	1792. PASS-HRS	1423. VEH-HRS	1792. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	1423. VEH-HRS	1792. PASS-HRS	1423. VEH-HRS	1792. PASS-HRS
TOTAL TRAV DISTANCE =	87103. VEH-MI.	109750. PASS-MI.	87103. VEH-MI.	109750. PASS-MI.
AVERAGE SYSTEM SPEED =	61. MPH.		61. MPH.	
AVERAGE DENSITY =	25. VPMPL		25. VPMPL	
TOTAL FUEL =	5156. GALLONS		5156. GALLONS	
TOTAL EMISSIONS =	1277. KILOGRAMS		1277. KILOGRAMS	

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

Background I-80 East Westbound 2023 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	2917.	13.	2917.	2917.	13.	2917.	4022.	0.	0.	0.	.73	65.	22.6	C	20.2	13.6
2	2	2290.	0.	0.	2904.	0.	0.	2904.	4022.	0.	0.	0.	.72	65.	22.5	C	20.2	13.6
3	2	17900.	71.	2.	2975.	71.	2.	2975.	4022.	0.	0.	0.	.74	64.	23.1	C	17.9	13.5
4	2	2340.	0.	0.	2973.	0.	0.	2973.	4022.	0.	0.	0.	.74	64.	23.1	C	17.9	13.5
5	2	4340.	19.	0.	2992.	19.	0.	2992.	4022.	0.	0.	0.	.74	64.	23.3	C	20.4	13.5
6	2	1710.	0.	0.	2992.	0.	0.	2992.	4022.	0.	0.	0.	.74	64.	23.3	C	17.9	13.5
7	2	8730.	1.	4.	2993.	1.	4.	2993.	4022.	0.	0.	0.	.74	64.	23.3	C	20.4	13.5
8	2	2430.	0.	0.	2989.	0.	0.	2989.	4022.	0.	0.	0.	.74	64.	23.2	C	17.9	13.5
9	2	19800.	2.	30.	2991.	2.	30.	2991.	4022.	0.	0.	0.	.74	64.	23.3	C	20.4	13.5
10	2	2800.	0.	0.	2961.	0.	0.	2961.	4022.	0.	0.	0.	.74	64.	23.0	C	17.9	13.5
11	2	23130.	109.	35.	3070.	109.	35.	3070.	4356.	0.	0.	0.	.70	65.	23.7	C	17.7	13.7
12	2	890.	0.	0.	3035.	0.	0.	3035.	4356.	0.	0.	0.	.70	65.	23.4	C	17.7	13.7
13	2	3060.	59.	0.	3094.	59.	0.	3094.	4356.	0.	0.	0.	.71	65.	23.9	C	15.6	13.6
14	2	5280.	0.	0.	3094.	0.	0.	3094.	4356.	0.	0.	0.	.71	65.	23.9	C	23.2	13.6
15	2	12032.	0.	25.	3094.	0.	25.	3094.	4356.	0.	0.	0.	.71	65.	23.9	C	17.8	13.6
16	2	3080.	0.	0.	3069.	0.	0.	3069.	4356.	0.	0.	0.	.70	65.	23.7	C	17.7	13.7
17	2	6860.	99.	12.	3168.	99.	12.	3168.	4356.	0.	0.	0.	.73	64.	24.6	C	20.2	13.6
18	2	1175.	0.	0.	3156.	0.	0.	3156.	4356.	0.	0.	0.	.72	65.	24.5	C	20.2	13.6
19	2	12400.	180.	275.	3336.	180.	275.	2551.	4356.	0.	* 6648.	785.	.59	37.	34.8	F	18.8	14.5
20	2	2250.	0.	0.	3061.	0.	0.	2276.	4356.	0.	** 2250.	785.	.52	12.	98.2	F	13.9	19.9
21	3	350.	1050.	0.	4111.	1050.	0.	3326.	6534.	0.	** 350.	785.	.51	9.	122.5	F	11.8	21.8
22	2	1100.	0.	0.	4111.	0.	0.	3326.	4356.	0.	** 1100.	785.	.76	17.	95.1	F	17.7	17.2
23	3	620.	0.	150.	4111.	0.	150.	3326.	6534.	0.	** 620.	785.	.51	8.	142.7	F	10.9	23.4
24	2	3050.	0.	0.	3961.	0.	0.	3176.	4356.	0.	** 3050.	785.	.73	13.	121.4	F	13.8	19.8
25	3	450.	1180.	0.	5141.	1180.	0.	4356.	6534.	0.	** 450.	785.	.67	10.	148.6	F	13.3	22.6
26	2	2640.	0.	419.	5141.	0.	355.	4356.	4356.	0.	0.	0.	1.00	52.	41.7	E	25.1	11.0
27	2	1375.	0.	0.	4722.	0.	0.	4001.	4356.	0.	0.	0.	.92	58.	34.4	D	23.3	11.8
28	3	350.	201.	0.	4923.	201.	0.	4202.	6534.	0.	0.	0.	.64	65.	21.5	C	20.0	13.7
29	2	1400.	0.	0.	4923.	0.	0.	4202.	4356.	0.	0.	0.	.96	55.	38.2	E	24.4	11.2
30	3	2640.	510.	5433.	5433.	510.	4712.	4712.	6534.	0.	0.	0.	.72	65.	24.3	C	20.2	13.6

TOTAL 149112. = 28.2 MILES MAX(V/C) = 1.00 LOWEST LOS = F AVG = 49. 29.8 18.7 13.9

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	1801. VEH-HRS	2269. PASS-HRS	1801. VEH-HRS	2269. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	1801. VEH-HRS	2269. PASS-HRS	1801. VEH-HRS	2269. PASS-HRS
TOTAL TRAV DISTANCE =	88511. VEH-MI.	111523. PASS-MI.	88511. VEH-MI.	111523. PASS-MI.
AVERAGE SYSTEM SPEED =	49. MPH.		49. MPH.	
AVERAGE DENSITY =	30. VPMPL		30. VPMPL	
TOTAL FUEL =	4733. GALLONS		4733. GALLONS	
TOTAL EMISSIONS =	1230. KILOGRAMS		1230. KILOGRAMS	

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

Background I-80 East Westbound 2023 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	3306.	13.	3306.	3306.	13.	3306.	4022.	0.	0.	0.	.82	62.	26.5	D	21.3	12.9
2	2	2290.	0.	0.	3293.	0.	0.	3293.	4022.	0.	0.	0.	.82	63.	26.3	D	21.2	13.0
3	2	17900.	71.	2.	3364.	71.	2.	3364.	4022.	0.	0.	0.	.84	62.	27.1	D	18.9	12.8
4	2	2340.	0.	0.	3362.	0.	0.	3362.	4022.	0.	0.	0.	.84	62.	27.1	D	18.9	12.8
5	2	4340.	18.	0.	3380.	18.	0.	3380.	4022.	0.	0.	0.	.84	62.	27.3	D	21.6	12.7
6	2	1710.	0.	0.	3380.	0.	0.	3380.	4022.	0.	0.	0.	.84	62.	27.3	D	19.0	12.7
7	2	8730.	1.	4.	3381.	1.	4.	3381.	4022.	0.	0.	0.	.84	62.	27.3	D	21.6	12.7
8	2	2430.	0.	0.	3377.	0.	0.	3377.	4022.	0.	0.	0.	.84	62.	27.3	D	19.0	12.7
9	2	19800.	2.	30.	3379.	2.	30.	3379.	4022.	0.	0.	0.	.84	62.	27.3	D	21.6	12.7
10	2	2800.	0.	0.	3349.	0.	0.	3349.	4022.	0.	0.	0.	.83	62.	27.0	D	18.9	12.8
11	2	23130.	266.	36.	3615.	266.	36.	3615.	4356.	0.	0.	0.	.83	62.	29.0	D	18.8	12.8
12	2	890.	0.	0.	3579.	0.	0.	3579.	4356.	0.	0.	0.	.82	62.	28.6	D	18.7	12.9
13	2	3060.	59.	0.	3638.	59.	0.	3638.	4356.	0.	0.	0.	.84	62.	29.3	D	16.7	12.8
14	2	5280.	0.	0.	3638.	0.	0.	3638.	4356.	0.	0.	0.	.84	62.	29.3	D	24.7	12.8
15	2	12032.	0.	24.	3638.	0.	24.	3638.	4356.	0.	0.	0.	.84	62.	29.3	D	18.9	12.8
16	2	3080.	0.	0.	3614.	0.	0.	3614.	4356.	0.	0.	0.	.83	62.	29.0	D	18.8	12.8
17	2	6860.	100.	13.	3714.	100.	13.	2373.	4356.	0.	* 3745.	1341.	.54	50.	23.9	F	21.2	13.0
18	2	1175.	0.	0.	3701.	0.	0.	2360.	4356.	0.	** 1175.	1341.	.54	30.	39.6	F	18.9	14.3
19	2	12400.	180.	273.	3881.	180.	273.	2540.	4356.	0.	**12400.	1341.	.58	17.	74.0	F	16.3	16.7
20	2	2250.	0.	0.	3608.	0.	0.	2267.	4356.	0.	** 2250.	1341.	.52	9.	127.3	F	12.3	21.8
21	3	350.	1050.	0.	4658.	1050.	0.	3317.	6534.	0.	** 350.	1341.	.51	8.	146.4	F	10.8	23.6
22	2	1100.	0.	0.	4658.	0.	0.	3317.	4356.	0.	** 1100.	1039.	.76	16.	103.5	F	17.3	17.7
23	3	620.	0.	151.	4658.	0.	141.	3317.	6534.	0.	** 620.	1039.	.51	7.	153.3	F	10.5	24.2
24	2	3050.	0.	0.	4507.	0.	0.	3176.	4356.	0.	** 3050.	1039.	.73	13.	125.0	F	13.7	20.0
25	3	450.	1180.	0.	5687.	1180.	0.	4356.	6534.	0.	** 450.	1039.	.67	10.	149.3	F	13.3	22.6
26	2	2640.	0.	420.	5687.	0.	322.	4356.	4356.	0.	0.	0.	1.00	52.	41.7	E	25.1	11.0
27	2	1375.	0.	0.	5267.	0.	0.	4034.	4356.	0.	0.	0.	.93	58.	35.0	D	23.5	11.7
28	3	350.	201.	0.	5468.	201.	0.	4235.	6534.	0.	0.	0.	.65	65.	21.7	C	20.0	13.7
29	2	1400.	0.	0.	5468.	0.	0.	4235.	4356.	0.	0.	0.	.97	54.	38.9	E	24.5	11.2
30	3	2640.	510.	5978.	5978.	510.	4745.	4745.	6534.	0.	0.	0.	.73	65.	24.5	C	20.2	13.6

TOTAL 149112. = 28.2 MILES MAX(V/C) = 1.00 LOWEST LOS = F AVG = 42. 37.3 19.3 13.4

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	2330. VEH-HRS	2936. PASS-HRS	2330. VEH-HRS	2936. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	2330. VEH-HRS	2936. PASS-HRS	2330. VEH-HRS	2936. PASS-HRS
TOTAL TRAV DISTANCE =	98991. VEH-MI.	124728. PASS-MI.	98991. VEH-MI.	124728. PASS-MI.
AVERAGE SYSTEM SPEED =	42. MPH.		42. MPH.	
AVERAGE DENSITY =	37. VPMPL		37. VPMPL	
TOTAL FUEL =	5133. GALLONS		5133. GALLONS	
TOTAL EMISSIONS =	1331. KILOGRAMS		1331. KILOGRAMS	

Background I-80 West Eastbound 2033 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	1978.	92.	1978.	1978.	92.	1978.	4022.	0.	0.	0.	.49	65.	15.2	B	26.7	13.7
2	2	2100.	0.	0.	1886.	0.	0.	1886.	4022.	0.	0.	0.	.47	65.	14.5	B	26.7	13.7
3	2	1740.	88.	0.	1974.	88.	0.	1974.	4022.	0.	0.	0.	.49	65.	15.2	B	26.7	13.7
4	2	2960.	0.	0.	1974.	0.	0.	1974.	4022.	0.	0.	0.	.49	65.	15.2	B	14.2	13.7
5	2	5100.	19.	61.	1993.	19.	61.	1993.	4252.	0.	0.	0.	.47	65.	15.3	B	23.0	13.7
6	2	2920.	0.	0.	1932.	0.	0.	1932.	4252.	0.	0.	0.	.45	65.	14.9	B	23.0	13.7
7	2	4350.	175.	0.	2107.	175.	0.	2107.	4252.	0.	0.	0.	.50	65.	16.2	B	20.0	13.7
8	3	680.	235.	0.	2342.	235.	0.	2342.	6378.	0.	0.	0.	.37	65.	12.0	B	23.0	13.7
9	2	880.	0.	39.	2342.	0.	39.	2342.	4252.	0.	0.	0.	.55	65.	18.0	C	23.0	13.7
10	2	1740.	0.	0.	2303.	0.	0.	2303.	4252.	0.	0.	0.	.54	65.	17.7	B	26.7	13.7
11	3	450.	84.	0.	2387.	84.	0.	2387.	6378.	0.	0.	0.	.37	65.	12.2	B	20.0	13.7
12	2	1600.	0.	179.	2387.	0.	179.	2387.	4252.	0.	0.	0.	.56	65.	18.4	C	20.0	13.7
13	2	6980.	0.	194.	2208.	0.	194.	2208.	4252.	0.	0.	0.	.52	65.	17.0	B	14.2	13.7
14	2	1500.	0.	0.	2014.	0.	0.	2014.	4356.	0.	0.	0.	.46	65.	15.5	B	17.6	13.7
15	4	4000.	630.	0.	2644.	630.	0.	2644.	8712.	0.	0.	0.	.30	65.	10.2	A	23.0	13.7
16	3	1200.	0.	450.	2644.	0.	450.	2644.	6534.	0.	0.	0.	.40	65.	13.6	B	20.0	13.7
17	2	4470.	0.	0.	2194.	0.	0.	2194.	4356.	0.	0.	0.	.50	65.	16.9	B	20.0	13.7
18	2	2640.	910.	3104.	3104.	910.	3104.	3104.	4356.	0.	0.	0.	.71	65.	24.0	C	20.2	13.6
TOTAL		47950. =	9.1 MILES								MAX(V/C) = 0.71		LOWEST LOS = C	AVG = 65.	15.9		19.8	13.7

	CURRENT TIME SLICE				CUMULATIVE VALUES			
FREEWAY TRAVEL TIME =	309.	VEH-HRS	390.	PASS-HRS	309.	VEH-HRS	390.	PASS-HRS
FREEWAY MERGE DELAY =	0.	VEH-HRS	0.	PASS-HRS	0.	VEH-HRS	0.	PASS-HRS
ON-RAMP MRG/CAP DELAY =	0.	VEH-HRS	0.	PASS-HRS	0.	VEH-HRS	0.	PASS-HRS
OFF-RAMP DELAY =	0.	VEH-HRS	0.	PASS-HRS	0.	VEH-HRS	0.	PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	309.	VEH-HRS	390.	PASS-HRS	309.	VEH-HRS	390.	PASS-HRS
TOTAL TRAV DISTANCE =	20108.	VEH-MI.	25336.	PASS-MI.	20108.	VEH-MI.	25336.	PASS-MI.
AVERAGE SYSTEM SPEED =	65.	MPH.			65.	MPH.		
AVERAGE DENSITY =	16.	VPMPL			16.	VPMPL		
TOTAL FUEL =	1014.	GALLONS			1014.	GALLONS		
TOTAL EMISSIONS =	276.	KILOGRAMS			276.	KILOGRAMS		

Background I-80 West Eastbound 2033 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	2659.	92.	2659.	2659.	92.	2659.	4022.	0.	0.	0.	.66	65.	20.5	C	26.7	13.7
2	2	2100.	0.	0.	2567.	0.	0.	2567.	4022.	0.	0.	0.	.64	65.	19.7	C	26.7	13.7
3	2	1740.	87.	0.	2654.	87.	0.	2654.	4022.	0.	0.	0.	.66	65.	20.4	C	26.7	13.7
4	2	2960.	0.	0.	2654.	0.	0.	2654.	4022.	0.	0.	0.	.66	65.	20.4	C	14.2	13.7
5	2	5100.	18.	60.	2672.	18.	60.	2672.	4252.	0.	0.	0.	.63	65.	20.6	C	23.0	13.7
6	2	2920.	0.	0.	2612.	0.	0.	2612.	4252.	0.	0.	0.	.61	65.	20.1	C	23.0	13.7
7	2	4350.	175.	0.	2787.	175.	0.	2787.	4252.	0.	0.	0.	.66	65.	21.4	C	20.0	13.7
8	3	680.	237.	0.	3024.	237.	0.	3024.	6378.	0.	0.	0.	.47	65.	15.5	B	23.0	13.7
9	2	880.	0.	39.	3024.	0.	39.	3024.	4252.	0.	0.	0.	.71	65.	23.4	C	23.2	13.6
10	2	1740.	0.	0.	2985.	0.	0.	2985.	4252.	0.	0.	0.	.70	65.	23.1	C	26.8	13.7
11	3	450.	84.	0.	3069.	84.	0.	3069.	6378.	0.	0.	0.	.48	65.	15.7	B	20.0	13.7
12	2	1600.	0.	180.	3069.	0.	180.	3069.	4252.	0.	0.	0.	.72	65.	23.8	C	20.2	13.6
13	2	6980.	0.	194.	2889.	0.	194.	2889.	4252.	0.	0.	0.	.68	65.	22.2	C	14.2	13.7
14	2	1500.	0.	0.	2695.	0.	0.	2695.	4356.	0.	0.	0.	.62	65.	20.7	C	17.6	13.7
15	4	4000.	630.	0.	3325.	630.	0.	3325.	8712.	0.	0.	0.	.38	65.	12.8	B	23.0	13.7
16	3	1200.	0.	450.	3325.	0.	450.	3325.	6534.	0.	0.	0.	.51	65.	17.1	B	20.0	13.7
17	2	4470.	0.	0.	2875.	0.	0.	2875.	4356.	0.	0.	0.	.66	65.	22.1	C	20.0	13.7
18	2	2640.	910.	3785.	3785.	910.	3785.	3785.	4356.	0.	0.	0.	.87	61.	31.2	D	22.3	12.3
TOTAL		47950. =	9.1 MILES								MAX(V/C) = 0.87		LOWEST LOS = D	AVG = 65.	20.9		20.0	13.6

	CURRENT TIME SLICE				CUMULATIVE VALUES			
FREEWAY TRAVEL TIME =	407.	VEH-HRS	512.	PASS-HRS	407.	VEH-HRS	512.	PASS-HRS
FREEWAY MERGE DELAY =	0.	VEH-HRS	0.	PASS-HRS	0.	VEH-HRS	0.	PASS-HRS
ON-RAMP MRG/CAP DELAY =	0.	VEH-HRS	0.	PASS-HRS	0.	VEH-HRS	0.	PASS-HRS
OFF-RAMP DELAY =	0.	VEH-HRS	0.	PASS-HRS	0.	VEH-HRS	0.	PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	407.	VEH-HRS	512.	PASS-HRS	407.	VEH-HRS	512.	PASS-HRS
TOTAL TRAV DISTANCE =	26289.	VEH-MI.	33124.	PASS-MI.	26289.	VEH-MI.	33124.	PASS-MI.
AVERAGE SYSTEM SPEED =	65.	MPH.			65.	MPH.		
AVERAGE DENSITY =	21.	VPMPL			21.	VPMPL		
TOTAL FUEL =	1315.	GALLONS			1315.	GALLONS		
TOTAL EMISSIONS =	358.	KILOGRAMS			358.	KILOGRAMS		

Background I-80 West Westbound 2033 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	3717.	1338.	3717.	3717.	1338.	3717.	4356.	0.	0.	0.	.85	61.	30.3	D	21.9	12.6
2	2	2640.	0.	0.	2379.	0.	0.	2379.	4356.	0.	0.	0.	.55	65.	18.3	C	20.0	13.7
3	2	4300.	356.	960.	2735.	356.	960.	2735.	4356.	0.	0.	0.	.63	65.	21.0	C	20.0	13.7
4	2	3300.	0.	0.	1775.	0.	0.	1775.	4356.	0.	0.	0.	.41	65.	13.7	B	14.2	13.7
5	3	430.	110.	0.	1885.	110.	0.	1885.	6534.	0.	0.	0.	.29	65.	9.7	A	17.6	13.7
6	2	7200.	0.	0.	1885.	0.	0.	1885.	4356.	0.	0.	0.	.43	65.	14.5	B	26.7	13.7
7	3	440.	130.	0.	2015.	130.	0.	2015.	6534.	0.	0.	0.	.31	65.	10.3	A	20.0	13.7
8	2	890.	0.	140.	2015.	0.	140.	2015.	4356.	0.	0.	0.	.46	65.	15.5	B	20.0	13.7
9	2	700.	0.	0.	1875.	0.	0.	1875.	4356.	0.	0.	0.	.43	65.	14.4	B	14.2	13.7
10	3	160.	14.	0.	1889.	14.	0.	1889.	6534.	0.	0.	0.	.29	65.	9.7	A	14.2	13.7
11	2	6840.	0.	169.	1889.	0.	169.	1889.	4356.	0.	0.	0.	.43	65.	14.5	B	17.6	13.7
12	2	5350.	0.	190.	1720.	0.	190.	1720.	4356.	0.	0.	0.	.39	65.	13.2	B	14.2	13.7
13	2	1480.	0.	0.	1530.	0.	0.	1530.	4356.	0.	0.	0.	.35	65.	11.8	B	17.6	13.7
14	3	765.	75.	0.	1605.	75.	0.	1605.	6231.	0.	0.	0.	.26	65.	8.2	A	17.6	13.7
15	2	4100.	0.	30.	1605.	0.	30.	1605.	4154.	0.	0.	0.	.39	65.	12.3	B	17.6	13.7
16	2	5430.	0.	191.	1575.	0.	191.	1575.	4154.	0.	0.	0.	.38	65.	12.1	B	20.0	13.7
17	2	2590.	0.	3.	1384.	0.	3.	1384.	3930.	0.	0.	0.	.35	65.	10.6	A	15.5	13.7
18	2	1156.	0.	0.	1381.	0.	0.	1381.	3930.	0.	0.	0.	.35	65.	10.6	A	15.5	13.7
19	2	2640.	110.	1491.	1491.	110.	1491.	1491.	3930.	0.	0.	0.	.38	65.	11.5	B	15.5	13.7

TOTAL 53051. = 10.0 MILES MAX(V/C) = 0.85 LOWEST LOS = D AVG = 65. 14.8 18.5 13.6

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	300. VEH-HRS	378. PASS-HRS	300. VEH-HRS	378. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	300. VEH-HRS	378. PASS-HRS	300. VEH-HRS	378. PASS-HRS
TOTAL TRAV DISTANCE =	19366. VEH-MI.	24401. PASS-MI.	19366. VEH-MI.	24401. PASS-MI.
AVERAGE SYSTEM SPEED =	65. MPH.		65. MPH.	
AVERAGE DENSITY =	15. VPMPL		15. VPMPL	
TOTAL FUEL =	1047. GALLONS		1047. GALLONS	
TOTAL EMISSIONS =	264. KILOGRAMS		264. KILOGRAMS	

Background I-80 West Westbound 2033 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	4231.	1338.	4231.	4231.	1338.	4231.	4356.	0.	0.	0.	.97	55.	38.8	E	24.5	11.2
2	2	2640.	0.	0.	2893.	0.	0.	2893.	4356.	0.	0.	0.	.66	65.	22.3	C	20.0	13.7
3	2	4300.	357.	960.	3250.	357.	960.	3250.	4356.	0.	0.	0.	.75	64.	25.3	C	20.4	13.5
4	2	3300.	0.	0.	2290.	0.	0.	2290.	4356.	0.	0.	0.	.53	65.	17.6	B	14.2	13.7
5	3	430.	109.	0.	2399.	109.	0.	2399.	6534.	0.	0.	0.	.37	65.	12.3	B	17.6	13.7
6	2	7200.	0.	0.	2399.	0.	0.	2399.	4356.	0.	0.	0.	.55	65.	18.5	C	26.7	13.7
7	3	440.	129.	0.	2528.	129.	0.	2528.	6534.	0.	0.	0.	.39	65.	13.0	B	20.0	13.7
8	2	890.	0.	140.	2528.	0.	140.	2528.	4356.	0.	0.	0.	.58	65.	19.4	C	20.0	13.7
9	2	700.	0.	0.	2388.	0.	0.	2388.	4356.	0.	0.	0.	.55	65.	18.4	C	14.2	13.7
10	3	160.	14.	0.	2402.	14.	0.	2402.	6534.	0.	0.	0.	.37	65.	12.3	B	14.2	13.7
11	2	6840.	0.	170.	2402.	0.	170.	2402.	4356.	0.	0.	0.	.55	65.	18.5	C	17.6	13.7
12	2	5350.	0.	190.	2232.	0.	190.	2232.	4356.	0.	0.	0.	.51	65.	17.2	B	14.2	13.7
13	2	1480.	0.	0.	2042.	0.	0.	2042.	4356.	0.	0.	0.	.47	65.	15.7	B	17.6	13.7
14	3	765.	75.	0.	2117.	75.	0.	2117.	6231.	0.	0.	0.	.34	65.	10.9	A	17.6	13.7
15	2	4100.	0.	29.	2117.	0.	29.	2117.	4154.	0.	0.	0.	.51	65.	16.3	B	17.6	13.7
16	2	5430.	0.	190.	2088.	0.	190.	2088.	4154.	0.	0.	0.	.50	65.	16.1	B	20.0	13.7
17	2	2590.	0.	3.	1898.	0.	3.	1898.	3930.	0.	0.	0.	.48	65.	14.6	B	15.5	13.7
18	2	1156.	0.	0.	1895.	0.	0.	1895.	3930.	0.	0.	0.	.48	65.	14.6	B	15.5	13.7
19	2	2640.	110.	2005.	2005.	110.	2005.	2005.	3930.	0.	0.	0.	.51	65.	15.4	B	15.5	13.7
TOTAL		53051. =	10.0 MILES								MAX(V/C) = 0.97		LOWEST LOS = E	AVG = 64.	18.9		18.6	13.5

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	384. VEH-HRS	484. PASS-HRS	384. VEH-HRS	484. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	384. VEH-HRS	484. PASS-HRS	384. VEH-HRS	484. PASS-HRS
TOTAL TRAV DISTANCE =	24525. VEH-MI.	30901. PASS-MI.	24525. VEH-MI.	30901. PASS-MI.
AVERAGE SYSTEM SPEED =	64. MPH.		64. MPH.	
AVERAGE DENSITY =	19. VPMPL		19. VPMPL	
TOTAL FUEL =	1320. GALLONS		1320. GALLONS	
TOTAL EMISSIONS =	331. KILOGRAMS		331. KILOGRAMS	

Background I-80 East Eastbound 2033 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	3	2640.	5419.	882.	5419.	5419.	882.	4807.	6534.	0.	** 2640.	612.	.74	15.	109.4	F	14.0	20.1
2	2	2540.	0.	0.	4537.	0.	0.	3925.	4356.	0.	** 2540.	431.	.90	21.	92.2	F	17.3	16.0
3	2	3720.	431.	903.	4968.	431.	792.	4356.	4356.	0.	0.	0.	1.00	52.	41.7	E	21.8	11.4
4	2	2000.	0.	0.	4065.	0.	0.	3564.	4356.	0.	0.	0.	.82	63.	28.5	D	18.8	13.6
5	2	1500.	114.	820.	4179.	114.	722.	3678.	4356.	0.	0.	0.	.84	62.	29.8	D	19.0	13.3
6	2	2200.	0.	0.	3359.	0.	0.	2956.	4356.	0.	0.	0.	.68	65.	22.8	C	17.7	14.5
7	2	3600.	450.	0.	3809.	450.	0.	3406.	4252.	0.	0.	0.	.80	63.	27.0	D	21.0	13.8
8	2	9304.	0.	146.	3809.	0.	131.	3406.	4252.	0.	0.	0.	.80	63.	27.0	D	18.4	13.8
9	2	1800.	0.	0.	3663.	0.	0.	3276.	4252.	0.	0.	0.	.77	64.	25.7	C	18.1	14.1
10	2	5460.	19.	100.	3682.	19.	89.	3295.	4252.	0.	0.	0.	.77	64.	25.9	C	16.2	14.1
11	2	3069.	0.	0.	3582.	0.	0.	3205.	4252.	0.	0.	0.	.75	68.	23.7	C	16.7	14.8
12	2	13300.	50.	0.	3632.	50.	0.	3255.	4252.	0.	0.	0.	.77	67.	24.1	C	16.8	14.8
13	2	5280.	0.	0.	3632.	0.	0.	3255.	4252.	0.	0.	0.	.77	67.	24.1	C	13.4	14.8
14	2	4180.	0.	52.	3632.	0.	47.	3255.	4252.	0.	0.	0.	.77	67.	24.1	C	19.1	14.8
15	2	2680.	0.	0.	3580.	0.	0.	3209.	4252.	0.	0.	0.	.75	68.	23.7	C	19.0	14.8
16	2	17724.	21.	45.	3601.	21.	40.	3230.	4252.	0.	0.	0.	.76	68.	23.9	C	16.7	14.8
17	2	2220.	0.	0.	3556.	0.	0.	3189.	4252.	0.	0.	0.	.75	68.	23.5	C	16.6	14.8
18	2	10560.	190.	0.	3746.	190.	0.	3379.	4252.	0.	0.	0.	.79	66.	25.4	C	17.1	14.7
19	2	8976.	0.	16.	3746.	0.	14.	3379.	4022.	0.	0.	0.	.84	65.	26.2	D	17.7	14.4
20	2	2020.	0.	0.	3730.	0.	0.	3365.	4022.	0.	0.	0.	.84	65.	26.0	D	17.6	14.5
21	2	8980.	5.	18.	3735.	5.	16.	3370.	4022.	0.	0.	0.	.84	65.	26.1	D	17.7	14.4
22	2	1750.	0.	0.	3717.	0.	0.	3354.	4022.	0.	0.	0.	.83	65.	25.9	C	17.6	14.5
23	2	4320.	1.	3.	3718.	1.	3.	3355.	4022.	0.	0.	0.	.83	65.	25.9	C	17.6	14.5
24	2	1800.	0.	0.	3715.	0.	0.	3352.	4022.	0.	0.	0.	.83	65.	25.8	C	17.6	14.5
25	2	17610.	10.	60.	3725.	10.	54.	3362.	4022.	0.	0.	0.	.84	65.	26.0	C	17.6	14.5
26	2	2640.	0.	0.	3665.	0.	0.	3308.	4022.	0.	0.	0.	.82	65.	25.3	C	17.4	14.6
27	2	2640.	15.	3680.	3680.	15.	3323.	3323.	4022.	0.	0.	0.	.83	65.	25.5	C	17.5	14.6
TOTAL		144513. =	27.4 MILES								MAX(V/C) = 1.00		LOWEST LOS = F	AVG = 57.	28.5		17.3	14.6

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	1617. VEH-HRS	2038. PASS-HRS	1617. VEH-HRS	2038. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	306. VEH-HRS	386. PASS-HRS	306. VEH-HRS	386. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	1923. VEH-HRS	2423. PASS-HRS	1923. VEH-HRS	2423. PASS-HRS
TOTAL TRAV DISTANCE =	92672. VEH-MI.	116767. PASS-MI.	92672. VEH-MI.	116767. PASS-MI.
AVERAGE SYSTEM SPEED =	48. MPH.		57. MPH.	
AVERAGE DENSITY =	28. VPMPL		28. VPMPL	
TOTAL FUEL =	5474. GALLONS		5474. GALLONS	
TOTAL EMISSIONS =	1397. KILOGRAMS		1397. KILOGRAMS	

Background I-80 East Eastbound 2033 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	3	2640.	6767.	882.	6767.	6534.	852.	4936.	6534.	0.	B* 2640.	1598.	.76	14.	121.7	F	13.8	20.6
2	2	2540.	0.	0.	5885.	0.	0.	4085.	4356.	0.	BB 2540.	271.	.94	25.	83.2	F	18.2	14.8
3	2	3720.	432.	903.	6317.	432.	623.	4356.	4356.	0.	M 2632.	0.	1.00	52.	41.7	E	21.8	11.4
4	2	2000.	0.	0.	5414.	0.	0.	3733.	4356.	0.	MM 2000.	0.	.86	61.	30.5	D	19.4	13.1
5	2	1500.	115.	820.	5529.	115.	545.	3676.	4356.	0.	0.	0.	.84	62.	29.8	D	19.0	13.3
6	2	2200.	0.	0.	4709.	0.	0.	3131.	4356.	0.	0.	0.	.72	65.	24.2	C	17.9	14.4
7	2	3600.	450.	0.	5159.	450.	0.	3581.	4252.	0.	0.	0.	.84	62.	29.0	D	21.6	13.4
8	2	9304.	0.	146.	5159.	0.	102.	3581.	4252.	0.	0.	0.	.84	62.	29.0	D	18.9	13.4
9	2	1800.	0.	0.	5013.	0.	0.	3479.	4252.	0.	0.	0.	.82	63.	27.8	D	18.6	13.7
10	2	5460.	19.	100.	5032.	19.	70.	3498.	4252.	0.	0.	0.	.82	62.	28.0	D	16.6	13.6
11	2	3069.	0.	0.	4932.	0.	0.	3429.	4252.	0.	0.	0.	.81	66.	26.0	C	17.2	14.7
12	2	13300.	51.	0.	4983.	51.	0.	3480.	4252.	0.	0.	0.	.82	66.	26.6	D	17.4	14.6
13	2	5280.	0.	0.	4983.	0.	0.	3480.	4252.	0.	0.	0.	.82	66.	26.6	D	13.8	14.6
14	2	4180.	0.	52.	4983.	0.	36.	3480.	4252.	0.	0.	0.	.82	66.	26.6	D	19.8	14.6
15	2	2680.	0.	0.	4931.	0.	0.	3443.	4252.	0.	0.	0.	.81	66.	26.1	D	19.7	14.7
16	2	17724.	21.	83.	4952.	21.	58.	3464.	4252.	0.	0.	0.	.81	66.	26.4	D	17.3	14.6
17	2	2220.	0.	0.	4869.	0.	0.	3406.	4252.	0.	0.	0.	.80	66.	25.7	C	17.1	14.7
18	2	10560.	79.	0.	4948.	79.	0.	3485.	4252.	0.	0.	0.	.82	65.	26.6	D	17.4	14.6
19	2	8976.	0.	15.	4948.	0.	10.	3485.	4022.	0.	0.	0.	.87	63.	27.6	D	18.2	13.9
20	2	2020.	0.	0.	4933.	0.	0.	3475.	4022.	0.	0.	0.	.86	63.	27.4	D	18.2	14.0
21	2	8980.	5.	19.	4938.	5.	13.	3480.	4022.	0.	0.	0.	.87	63.	27.5	D	18.2	13.9
22	2	1750.	0.	0.	4919.	0.	0.	3467.	4022.	0.	0.	0.	.86	63.	27.3	D	18.1	14.0
23	2	4320.	1.	3.	4920.	1.	2.	3468.	4022.	0.	0.	0.	.86	63.	27.3	D	18.1	14.0
24	2	1800.	0.	0.	4917.	0.	0.	3466.	4022.	0.	0.	0.	.86	63.	27.3	D	18.1	14.0
25	2	17610.	10.	61.	4927.	10.	43.	3476.	4022.	0.	0.	0.	.86	63.	27.5	D	18.2	14.0
26	2	2640.	0.	0.	4866.	0.	0.	3433.	4022.	0.	0.	0.	.85	64.	26.9	D	17.9	14.2
27	2	2640.	15.	4881.	4881.	15.	3448.	3448.	4022.	0.	0.	0.	.86	64.	27.1	D	18.0	14.1
TOTAL		144513. =	27.4 MILES								MAX(V/C) = 1.00	LOWEST LOS = F		AVG = 56.	30.3		17.8	14.3

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	1723. VEH-HRS	2170. PASS-HRS	1723. VEH-HRS	2170. PASS-HRS
FREEWAY MERGE DELAY =	167. VEH-HRS	210. PASS-HRS	167. VEH-HRS	210. PASS-HRS
ON-RAMP MRG/CAP DELAY =	915. VEH-HRS	1153. PASS-HRS	915. VEH-HRS	1153. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	2804. VEH-HRS	3533. PASS-HRS	2804. VEH-HRS	3533. PASS-HRS
TOTAL TRAV DISTANCE =	97036. VEH-MI.	122266. PASS-MI.	97036. VEH-MI.	122266. PASS-MI.
AVERAGE SYSTEM SPEED =	35. MPH.		56. MPH.	
AVERAGE DENSITY =	30. VPMPL		30. VPMPL	
TOTAL FUEL =	5875. GALLONS		5875. GALLONS	
TOTAL EMISSIONS =	1548. KILOGRAMS		1548. KILOGRAMS	

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

Background I-80 East Westbound 2033 Low Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	3904.	13.	3904.	3904.	13.	3904.	4022.	0.	0.	0.	.97	55.	35.7	E	24.5	11.2
2	2	2290.	0.	0.	3891.	0.	0.	3891.	4022.	0.	0.	0.	.97	55.	35.5	E	24.4	11.2
3	2	17900.	70.	2.	3961.	70.	2.	3961.	4022.	0.	0.	0.	.98	53.	37.0	E	21.8	11.1
4	2	2340.	0.	0.	3959.	0.	0.	3959.	4022.	0.	0.	0.	.98	54.	37.0	E	21.8	11.1
5	2	4340.	19.	0.	3978.	19.	0.	3978.	4022.	0.	0.	0.	.99	53.	37.4	E	24.8	11.1
6	2	1710.	0.	0.	3978.	0.	0.	3978.	4022.	0.	0.	0.	.99	53.	37.4	E	21.9	11.1
7	2	8730.	1.	4.	3979.	1.	4.	3979.	4022.	0.	0.	0.	.99	53.	37.4	E	24.8	11.1
8	2	2430.	0.	0.	3975.	0.	0.	3975.	4022.	0.	0.	0.	.99	53.	37.4	E	21.9	11.1
9	2	19800.	2.	31.	3977.	2.	31.	3977.	4022.	0.	0.	0.	.99	53.	37.4	E	24.8	11.1
10	2	2800.	0.	0.	3946.	0.	0.	3946.	4022.	0.	0.	0.	.98	54.	36.7	E	21.8	11.1
11	2	23130.	232.	36.	4178.	232.	36.	4178.	4356.	0.	0.	0.	.96	55.	37.7	E	21.3	11.3
12	2	890.	0.	0.	4142.	0.	0.	4142.	4356.	0.	0.	0.	.95	56.	36.9	E	21.1	11.4
13	2	3060.	60.	0.	4202.	60.	0.	4202.	4356.	0.	0.	0.	.96	55.	38.2	E	18.8	11.2
14	2	5280.	0.	0.	4202.	0.	0.	4202.	4356.	0.	0.	0.	.96	55.	38.2	E	28.5	11.2
15	2	12032.	0.	24.	4202.	0.	24.	2283.	4356.	0.	* 5343.	1919.	.52	48.	23.9	F	20.9	11.5
16	2	3080.	0.	0.	4178.	0.	0.	2259.	4356.	0.	** 3080.	1919.	.52	28.	40.3	F	18.3	13.1
17	2	6860.	100.	14.	4278.	100.	14.	2359.	4356.	0.	** 6860.	1919.	.54	21.	57.5	F	18.5	14.5
18	2	1175.	0.	0.	4264.	0.	0.	2345.	4356.	0.	** 1175.	1919.	.54	16.	72.1	F	16.7	15.9
19	2	12400.	180.	277.	4444.	180.	272.	2525.	4356.	0.	**12400.	1831.	.58	13.	95.1	F	15.2	17.8
20	2	2250.	0.	0.	4167.	0.	0.	2254.	4356.	0.	** 2250.	1831.	.52	8.	138.5	F	11.9	22.4
21	3	350.	1050.	0.	5217.	1050.	0.	3304.	6534.	0.	** 350.	1831.	.51	7.	155.0	F	10.5	24.2
22	2	1100.	0.	0.	5217.	0.	0.	3304.	4356.	0.	** 1100.	1052.	.76	16.	104.3	F	17.2	17.8
23	3	620.	0.	153.	5217.	0.	128.	3304.	6534.	0.	** 620.	1052.	.51	7.	154.0	F	10.5	24.3
24	2	3050.	0.	0.	5064.	0.	0.	3176.	4356.	0.	** 3050.	1052.	.73	13.	125.2	F	13.7	20.0
25	3	450.	1180.	0.	6244.	1180.	0.	4356.	6534.	0.	** 450.	1052.	.67	10.	149.3	F	13.3	22.6
26	2	2640.	0.	424.	6244.	0.	296.	4356.	4356.	0.	0.	0.	1.00	52.	41.7	E	25.1	11.0
27	2	1375.	0.	0.	5820.	0.	0.	4060.	4356.	0.	0.	0.	.93	57.	35.4	E	23.6	11.6
28	3	350.	201.	0.	6021.	201.	0.	4261.	6534.	0.	0.	0.	.65	65.	21.9	C	20.0	13.7
29	2	1400.	0.	0.	6021.	0.	0.	4261.	4356.	0.	0.	0.	.98	54.	39.4	E	24.6	11.1
30	3	2640.	510.	6531.	6531.	510.	4771.	4771.	6534.	0.	0.	0.	.73	64.	24.7	C	20.3	13.6

TOTAL 149112. = 28.2 MILES MAX(V/C) = 1.00 LOWEST LOS = F AVG = 36. 47.0 21.0 12.3

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	3082. VEH-HRS	3883. PASS-HRS	3082. VEH-HRS	3883. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	3082. VEH-HRS	3883. PASS-HRS	3082. VEH-HRS	3883. PASS-HRS
TOTAL TRAV DISTANCE =	110900. VEH-MI.	139734. PASS-MI.	110900. VEH-MI.	139734. PASS-MI.
AVERAGE SYSTEM SPEED =	36. MPH.		36. MPH.	
AVERAGE DENSITY =	47. VPMPL		47. VPMPL	
TOTAL FUEL =	5292. GALLONS		5292. GALLONS	
TOTAL EMISSIONS =	1367. KILOGRAMS		1367. KILOGRAMS	

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

Background I-80 East Westbound 2033 High Estimate

TIME SLICE FREEWAY PERFORMANCE TABLE

SUB SEC	NO. LNS	SSEC LENGTH	O-D DATA DEMANDS ORG	DES	SSEC	ADJUSTED VOLUMES ORG	DES	SSEC	SSEC CAP.	WEAVE EFF	CONGEST LENGTH	STORAGE RATE	V/C RATIO	SPEED MPH	DENSITY VPMPL	LOS LEVEL	FUEL MPG	EMISS GS/VM
1	2	2640.	5176.	13.	5176.	4022.	10.	3965.	4022.	0.	** 2640.	57.	.99	28.	70.5	F	22.2	13.1
2	2	2290.	0.	0.	5163.	0.	0.	3955.	4022.	0.	** 2290.	57.	.98	32.	62.4	F	22.8	12.6
3	2	17900.	67.	2.	5230.	67.	2.	4022.	4022.	0.	0.	0.	1.00	52.	38.5	E	22.1	11.0
4	2	2340.	0.	0.	5228.	0.	0.	4004.	4022.	0.	* 1472.	16.	.99	42.	47.6	F	21.1	11.5
5	2	4340.	18.	0.	5246.	18.	0.	4022.	4022.	0.	0.	0.	1.00	52.	38.5	E	25.1	11.0
6	2	1710.	0.	0.	5246.	0.	0.	4022.	4022.	0.	0.	0.	1.00	51.	39.3	E	22.1	11.0
7	2	8730.	1.	4.	5247.	1.	3.	4022.	4022.	0.	0.	0.	1.00	52.	38.5	E	25.1	11.0
8	2	2430.	0.	0.	5243.	0.	0.	4019.	4022.	0.	0.	0.	.99	52.	38.4	E	22.1	11.0
9	2	19800.	3.	29.	5246.	3.	22.	3882.	4022.	0.	* 7277.	140.	.97	46.	41.9	F	24.6	11.3
10	2	2800.	0.	0.	5217.	0.	0.	3860.	4022.	0.	** 2800.	140.	.96	28.	70.0	F	18.5	13.4
11	2	23130.	496.	34.	5713.	496.	26.	4322.	4356.	0.	* 1809.	34.	.99	51.	42.2	F	22.1	11.0
12	2	890.	0.	0.	5679.	0.	0.	4296.	4356.	0.	** 890.	34.	.99	31.	69.8	F	19.4	12.7
13	2	3060.	60.	0.	5739.	60.	0.	4356.	4356.	0.	0.	0.	1.00	52.	41.7	E	19.3	11.0
14	2	5280.	0.	0.	5739.	0.	0.	4356.	4356.	0.	0.	0.	1.00	52.	41.7	E	29.6	11.0
15	2	12032.	0.	24.	5739.	0.	18.	2276.	4356.	0.	* 8128.	2080.	.52	40.	28.2	F	20.9	11.6
16	2	3080.	0.	0.	5715.	0.	0.	2258.	4356.	0.	** 3080.	2080.	.52	24.	46.4	F	18.0	13.4
17	2	6860.	100.	13.	5815.	100.	10.	2358.	4356.	0.	** 6860.	1998.	.54	20.	59.3	F	18.5	14.5
18	2	1175.	0.	0.	5802.	0.	0.	2348.	4356.	0.	** 1175.	1998.	.54	16.	73.2	F	16.8	15.9
19	2	12400.	80.	275.	5882.	80.	204.	2428.	4356.	0.	**12400.	1928.	.56	12.	97.7	F	14.7	18.2
20	2	2250.	0.	0.	5607.	0.	0.	2224.	4356.	0.	** 2250.	1928.	.51	8.	140.8	F	11.7	22.5
21	3	350.	1050.	0.	6657.	1050.	0.	3274.	6534.	0.	** 350.	1928.	.50	7.	156.8	F	10.4	24.4
22	2	1100.	0.	0.	6657.	0.	0.	3274.	4356.	0.	** 1100.	1082.	.75	15.	105.9	F	17.0	18.0
23	3	620.	0.	150.	6657.	0.	98.	3274.	6534.	0.	** 620.	1082.	.50	7.	155.6	F	10.4	24.4
24	2	3050.	0.	0.	6507.	0.	0.	3176.	4356.	0.	** 3050.	1082.	.73	13.	125.5	F	13.7	20.0
25	3	450.	1180.	0.	7687.	1180.	0.	4356.	6534.	0.	** 450.	1082.	.67	10.	149.4	F	13.3	22.6
26	2	2640.	0.	419.	7687.	0.	237.	4356.	4356.	0.	0.	0.	1.00	52.	41.7	E	25.1	11.0
27	2	1375.	0.	0.	7268.	0.	0.	4119.	4356.	0.	0.	0.	.95	56.	36.5	E	23.9	11.5
28	3	350.	201.	0.	7469.	201.	0.	4320.	6534.	0.	0.	0.	.66	65.	22.2	C	20.0	13.7
29	2	1400.	0.	0.	7469.	0.	0.	4320.	4356.	0.	0.	0.	.99	53.	40.8	E	24.9	11.0
30	3	2640.	510.	7979.	7979.	510.	4830.	4830.	6534.	0.	0.	0.	.74	64.	25.0	C	20.3	13.5

TOTAL 149112. = 28.2 MILES MAX(V/C) = 1.00 LOWEST LOS = F AVG = 33. 51.8 21.0 12.4

SIMULATION BEFORE ENTRY CONTROL
TIME SLICE 1 OF 1

	CURRENT TIME SLICE		CUMULATIVE VALUES	
FREEWAY TRAVEL TIME =	3405. VEH-HRS	4290. PASS-HRS	3405. VEH-HRS	4290. PASS-HRS
FREEWAY MERGE DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
ON-RAMP MRG/CAP DELAY =	605. VEH-HRS	763. PASS-HRS	605. VEH-HRS	763. PASS-HRS
OFF-RAMP DELAY =	0. VEH-HRS	0. PASS-HRS	0. VEH-HRS	0. PASS-HRS
TOTAL SYSTEM TRAVEL TIME =	4011. VEH-HRS	5053. PASS-HRS	4011. VEH-HRS	5053. PASS-HRS
TOTAL TRAV DISTANCE =	112507. VEH-MI.	141759. PASS-MI.	112507. VEH-MI.	141759. PASS-MI.
AVERAGE SYSTEM SPEED =	28. MPH.		33. MPH.	
AVERAGE DENSITY =	52. VPMPL		52. VPMPL	
TOTAL FUEL =	5577. GALLONS		5577. GALLONS	
TOTAL EMISSIONS =	1480. KILOGRAMS		1480. KILOGRAMS	

TABLE OF CONTENTS

1. Methodology 1

2. Influence diagram.....3

3. Legend and evaluation metrics.....4

3.1 West Verdi-Verdi, Garson and East Verdi interchange north areas of influence

Land use and economic indicators.....5

Physical and environmental constraints 6

3.2 West Verdi-Verdi, Garson and East Verdi interchange south areas of influence

Land use and economic indicators.....7

Physical and environmental constraints 8

3.3 Mogul, West 4th and Robb interchange north areas of influence

Land use and economic indicators.....9

Physical and environmental constraints 10

3.4 Mogul, West 4th and Robb interchange south areas of influence

Land use and economic indicators.....11

Physical and environmental constraints 12

3.5 West McCarran interchange north area of influence

Land use and economic indicators.....13

Physical and environmental constraints 14

3.6 West McCarran interchange south area of influence

Land use and economic indicators.....15

Physical and environmental constraints 16

3.7 East McCarran and Sparks interchange north areas of influence

Land use and economic indicators.....17

Physical and environmental constraints 18

3.8 East McCarran and Sparks interchange north areas of influence

Land use and economic indicators.....19

Physical and environmental constraints 20

3.9 Vista interchange north area of influence

Land use and economic indicators.....21

Physical and environmental constraints 22

3.10 Vista interchange south area of influence

Land use and economic indicators.....23

Physical and environmental constraints 24

TABLE OF CONTENTS

3.11 Lockwood and Mustang interchange North areas of influence

Land use and economic indicators.....25

Physical and environmental constraints 26

3.12 Lockwood and Mustang interchange south areas of influence

Land use and economic indicators.....27

Physical and environmental constraints 28

3.13 Patrick interchange north area of influence

Land use and economic indicators.....29

Physical and environmental constraints 30

3.14 Patrick interchange south area of influence

Land use and economic indicators.....31

Physical and environmental constraints 32

3.15 USA Parkway interchange north area of influence

Land use and economic indicators.....33

Physical and environmental constraints 34

3.16 USA Parkway interchange south area of influence

Land use and economic indicators.....35

Physical and environmental constraints 36

3.17 Derby and Orchard interchange north areas of influence

Land use and economic indicators.....37

Physical and environmental constraints 38

3.17 Derby and Orchard interchange south areas of influence

Land use and economic indicators.....39

Physical and environmental constraints 40

3.18 Painted Rock and Wadsworth interchanges north areas of influence

Land use and economic indicators.....41

Physical and environmental constraints 42

3.19 Painted Rock and Wadsworth interchanges south areas of influence

Land use and economic indicators.....43

Physical and environmental constraints 44

4. Environmental Analysis 45

4.1 Land ownership and project study area 50

4.2 Special Status vegetation in the study area.....51

4.3 Noxious weeds in and around the study area.....52

4.4 Special status wildlife in the study area 53

4.5 Sage grouse habitat in and around the study area ..54

4.6 Mule deer habitat in the study area.....55

4.7 Pronghorn antelope habitat in and around the study area.....56

4.8 Desert bighorn habitat in and around the study area.....57

4.9 Desert bighorn habitat in and around the study area.....58

4.10 General land office plat map data in and around the study area 59

I-80 CORRIDOR LATENT CAPACITY METHODOLOGY

The I-80 Corridor Study covers a corridor from the California state line to the West McCarran Interchange and from the East McCarran Interchange to just east of the Wadsworth Interchange. The corridor currently operates at "free flow" capacity, which means the speed at which drivers feel comfortable. This is a situation where the corridor facilities have the capacity for additional operators, which is termed "latent capacity."

The methodology for assessing the magnitude and timing for consumption of this latent capacity includes the following components:

- Baseline and Background
- Improvements
- Consumption Timeframe
- Latent capacity Analysis

Figure 1 illustrates the component relationships.

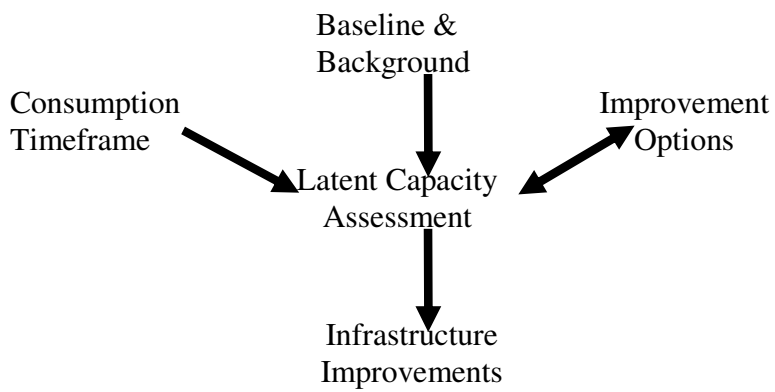


Figure 1. Latent Capacity Analysis Components

Baseline and Background focuses on establishing baseline and future conditions for 2-, 7-, 15-, and 25-year horizons and analyzing operations for each. Any improvements required for background conditions are identified before the Consumption Timeframe component.

The Improvements component determines improvement categories and corresponding operational characteristics, costs, benefits, and selection criteria. Improvements include all aspects of transportation infrastructure.

The Consumption Timeframe component assembles the variables affecting latent capacity consumption and establishes a timeline for deploying mitigation measures. An uncertainty-based approach is used to estimate development probabilities along the corridor, based on horizon year information. These development probabilities are applied to trips established in the Washoe County Regional Transportation Commission's 2040 Regional Model.

The Latent Capacity component focuses on operational and service thresholds and identifying progressive Improvement Options that restore latent capacity to the transportation infrastructure. As the two-way arrow in Figure 1 indicates, this is an iterative analysis process, using analysis software.

Each analysis component is developed independently. Once all the steps are complete, the Timeline component is placed over the Latent Capacity component and compared to the Infrastructure Improvements component to determine feasible improvements along the corridor.

The uncertainty-based Consumption Timeframe in this methodology is established through expert opinion, a widely used technique for probabilistic risk and decision analysis (Bedford & Cooke, 2001; Edwards, Miles, & von Wintergeldt, 2007; Morgan & Henrion, 1990). Industry experts are asked about the nature of future events, taking into account risk and uncertainty, which has a long tradition in planning and development (Byrne, 1996). For the I-80 Corridor Latent Capacity methodology, we will engage a broad-based group of experts with diverse issues.

Capturing expert opinion relies on a method developed by the RAND Corporation as a technique for assessing expert opinion through successive anonymous polling of a cross-section of experts (Glotz & Bertschi, 2006; Gordon, 1994; Linstone, Turoff, & Helmer, 2002; Sackman, 1974). The traditional procedure calls for surveying the experts through a series of questions, which are collected, compiled, analyzed for consensus, reformatted, and returned to the experts for the next round of questions. This procedure is repeated until a consensus is reached. Delphi has been expanded to include statistical analysis of the experts' opinions (Glotz & Bertschi, 2006; Linstone, Turoff, & Helmer, 2002).

The Delphi method will be tailored for this project by concentrating the opinion-gathering into a one-day workshop involving electronic polling of gathered experts and immediate feedback of the aggregated opinion distribution.

Workshop preparation includes a detailed review of this backgrounder document, which is organized by north and south interchange "service sheds" (influence areas). Factors such as land use, development attractiveness, and physical and environmental constraints are compiled into a series of map graphics, which also include a qualitative assessment of the factors by experts on the project team. Workshop attendees will be asked a series of questions. Attendee responses, via anonymous electronic polling, should include the qualitative assessments provided in this backgrounder and each attendee's expertise and independent judgment.

The workshop will also include breakout sessions allowing for detailed discussion and information exchange. The following page includes an Influence Diagram developed for providing insight into a series of various potential components of land development.

Bedford, T. & Cooke, R. (2001). *Probabilistic risk Analysis: Foundations and methods*. New York: Cambridge University Press.

Byrne, P. (1996). *Risk, uncertainty, and decision-making in property development*, (2nd Ed.). New York: Taylor & Francis.

Edwards, W., Miles, R. F., & von Wintergeldt, D. (2007). *Advances in decision analysis: From fundamentals to applications*. New York: Cambridge University Press.

Glotz P. & Bertschi, S. (2006;). People, Mobiles, and society: Concluding insights from an international expert survey. *Knowledge, Technology, & Policy, 19*(2), pp. 69-92.

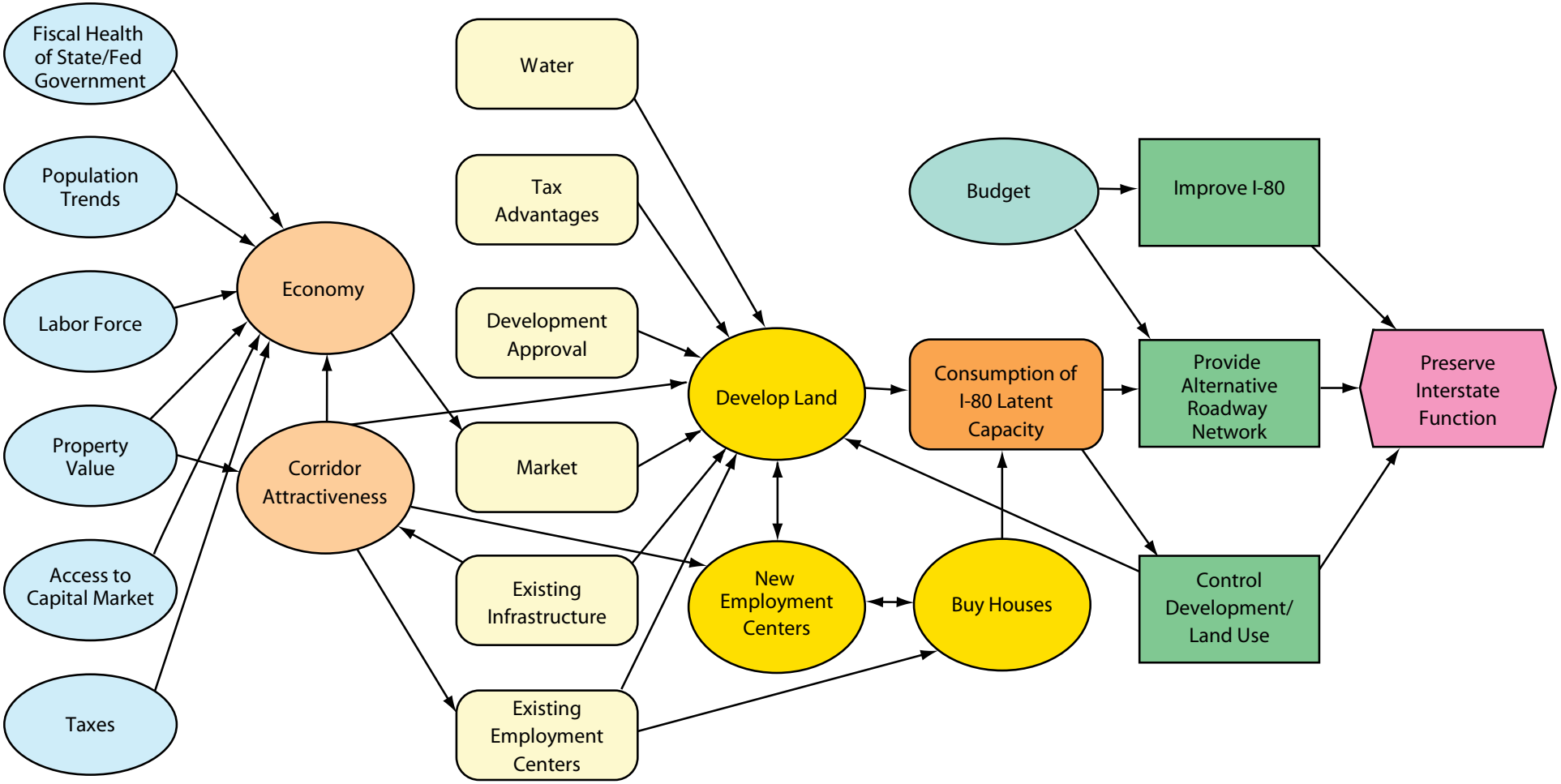
Gordon, T. J. (1994). *The Delphi method*. http://www.gerenciamento.ufba.br/Downloads/delphi%20(1).pdf

Linstone, H. A., Turoff, M., & Helmer, O. (2002). *The Delphi method: Applications and Techniques*. Available on the World Wide Web at http://is.njit.edu/pubs/delphibook/delphibook.pdf

Morgan, M. G. & Henrion, M. (1990). *Uncertainty: A guide to dealing with uncertainty in quantitative risk and policy analysis*. New York: Cambridge University Press.

Sackman, H. (1974). *Delphi assessment: Expert opinion, forecasting, and group process*. Available on the World Wide Web at http://www.rand.org/pubs/reports/2006/R1283.pdf

I-80 CORRIDOR INFLUENCE DIAGRAM



LAND USE LEGEND

WASHOE COUNTY

SYMBOL	LAND USE DESCRIPTION
LR	LOW DENSITY RURAL
MR	MEDIUM DENSITY RURAL
HR	HIGH DENSITY RURAL
LS	LOW DENSITY SUBURBAN
MS	MEDIUM DENSITY SUBURBAN
HS	HIGH DENSITY SUBURBAN
LU	LOW DENSITY URBAN
MU	MEDIUM DENSITY URBAN
HU	HIGH DENSITY URBAN
GC	GENERAL COMMERCIAL
NC/O	NEIGHBORHOOD COMMERCIAL/OFFICE
TC	TOURIST COMMERCIAL
I	INDUSTRIAL
SP	SPECIFIC PLAN
PF	PUBLIC AND SEMI-PUBLIC FACILITIES
P	PARKS AND RECREATION
OS	OPEN SPACE
RR/GR	RURAL RESIDENTIAL/GENERAL RURAL

CITY OF RENO

SYMBOL	LAND USE DESCRIPTION
I	INDUSTRIAL
MR	MIXED RESIDENTIAL
P/OS	PARKS/RECREATION/OPEN SPACE
PF	PUBLIC FACILITY
IC	RENO SPARKS INDIAN COLONY
SF	SINGLE FAMILY RESIDENTIAL
SPA	SPECIAL PLANNING AREA
TC	TOURIST COMMERCIAL
UT	UNINCORPORATED TRANSITION
UR	URBAN RESIDENTIAL COMMERCIAL

CITY OF SPARKS

SYMBOL	LAND USE DESCRIPTION
EDR	ESTATE DENSITY RES. 1-3 DU/AC
LDR	LOW DENSITY RES. 3-7 DU/AC
LMDR	LOW MEDIUM DENSITY RES. 7-14 DU/AC
MdR	MEDIUM DENSITY RES. 14-20 DU/AC
HDR	HIGH DENSITY RES. 20-43 DU/AC
LDR/MDR	LOW DENSITY RES. / MEDIUM DENSITY RES.
MUD	MIXED USE
CI	COMM. INDUSTRIAL
CI/I	COMM. INDUSTRIAL /INDUSTRIAL
I	INDUSTRIAL
GC	GENERAL COMM.
GC/CI	GENERAL COMM. / COMM. INDUSTRIAL
GC/HDR	GENERAL COMM. / HIGH DENSITY RES.
TC	TOURIST COMM.
TC/GC	TOURIST COMM. / GENERAL COMM.
OP	OFFICE PROFESSIONAL
OP/CI	OFFICE PROFESSIONAL / COMM. INDUSTRIAL
OS	OPEN SPACE/RURAL RESERVE
P	PARK
PF	PUBLIC FACILITY
SCHOOL	SCHOOL
BP	BUSINESS PARK

RATING SCALE

SYMBOL	VALUE
○	LOW
⊖	MEDIUM LOW
◒	MEDIUM HIGH
●	HIGH

STOREY COUNTY

SYMBOL	LAND USE DESCRIPTION
AG	AGRICULTURAL
C	COMMERCIAL
CR	COMMERCIAL RESIDENTIAL
E	ESTATES
F	FORESTRY
I-1	LIGHT INDUSTRIAL
1-2	HEAVY INDUSTRIAL
SI	SPECIAL INDUSTRIAL
PUD	PLANNED UNIT DEVELOPMENT AND SUBDIVISIONS
P	PUBLIC
R-2	MULTIPLE RESIDENTIAL
R-1	RESIDENTIAL
MP	MOBILE HOME PARK
SPR	SPECIAL PLANNING REVIEW
SPR (dashed)	PROPOSED COMMUNITY OF McCARRAN

ECONOMIC VARIABLES

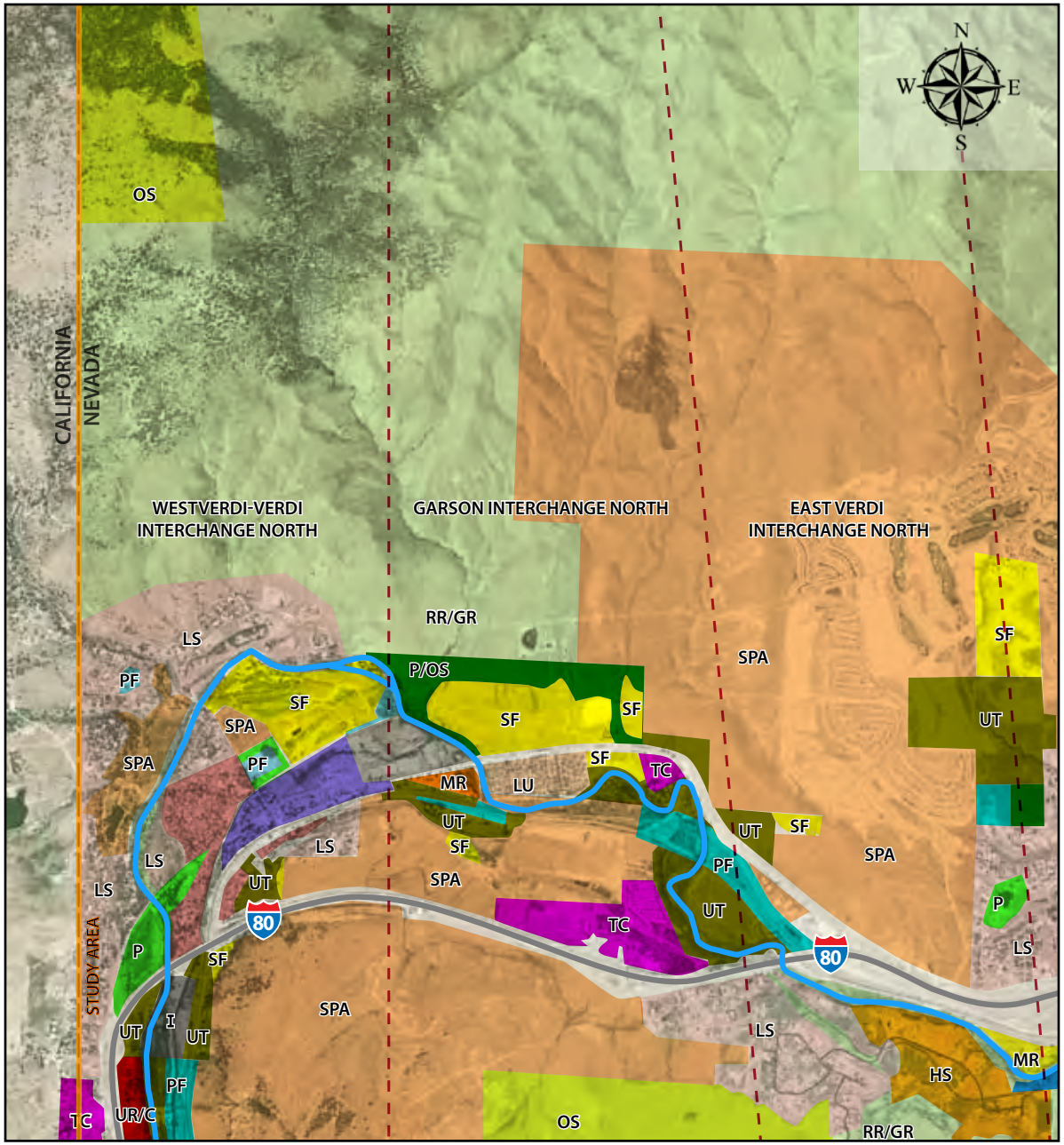
MARKET loosely defined as access to rail lines, access to Oakland Port, and basic economic indicators such as interest rates, access to capital, health of local economy. It should be noted that all sites rate the same on the economic indicators as all are affected equally by regional, national and Global economic conditions.

ATTRACTIVENESS loosely defined as the landowners' ability to market the land to a developer, including: ease of obtaining entitlements, government cooperation, availability of infrastructure, cost of infrastructure, access to capital markets.

EMPLOYMENT loosely defined as commuting distance, commuting ease-good access and highway system to site, proximity of housing and available labor force.

DEVELOPABLE LAND defined as availability of bare land.

1 - WestVerdi-Verdi Interchange North, Garson Interchange North, East Verdi Interchange North



LEGEND: I-80 River Boundary Lines Corridor Limits

ECONOMIC VALUES - WEST VERDI-VERDI

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

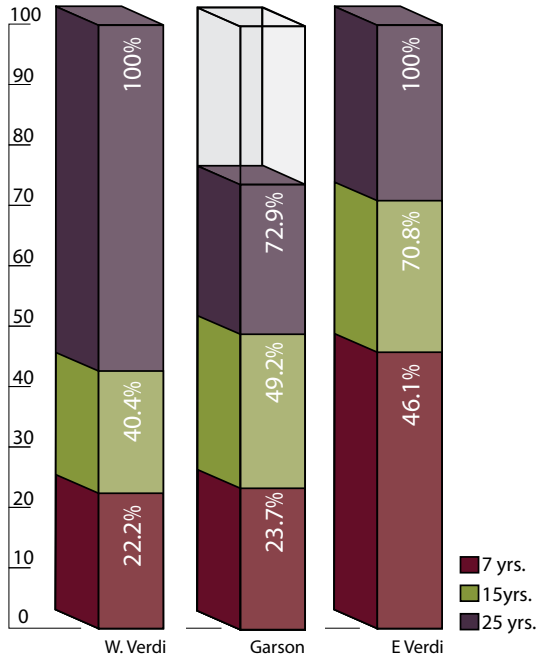
ECONOMIC VALUES - GARSON

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

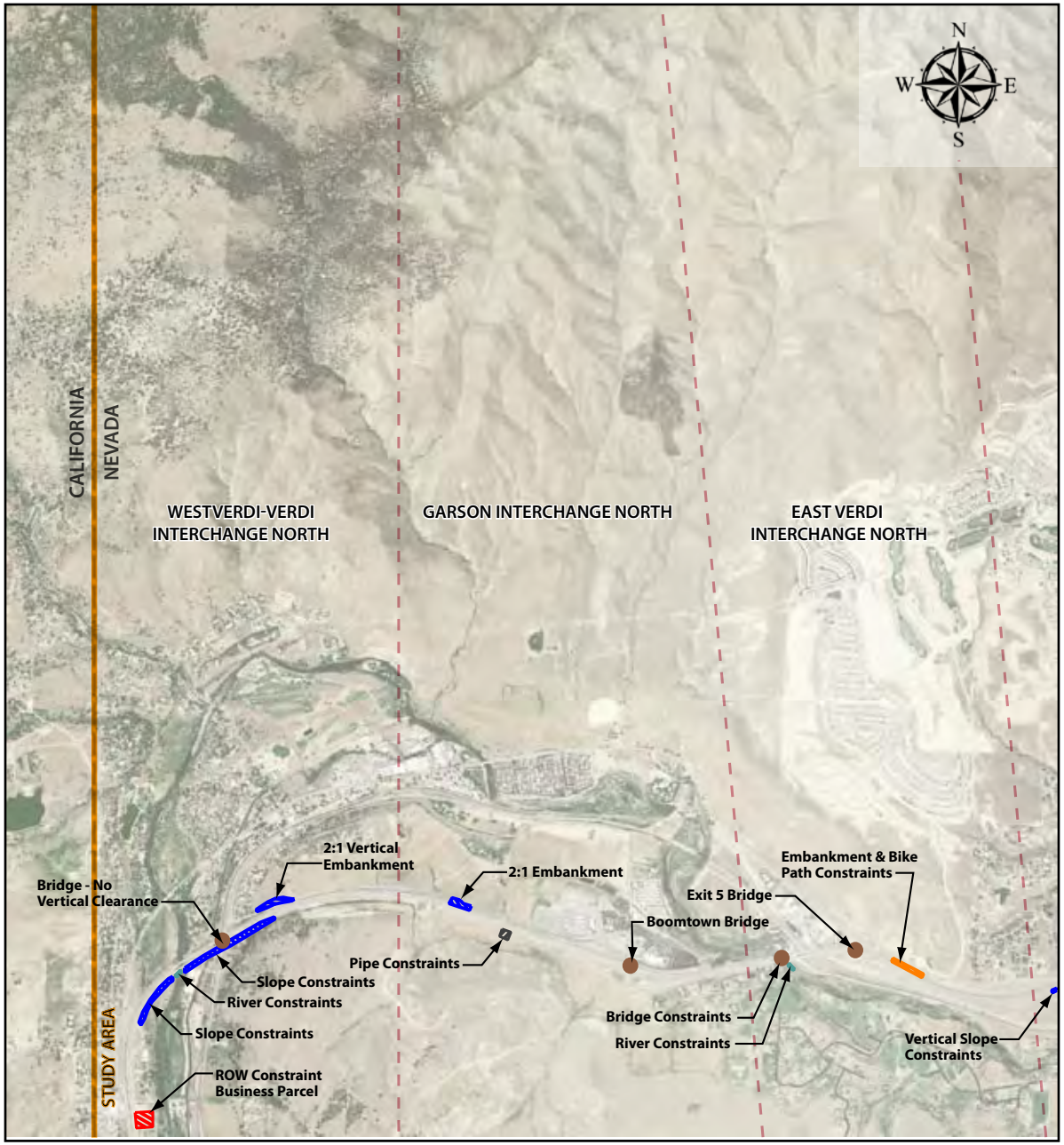
ECONOMIC VALUES - EAST VERDI-VERDI

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

REALIZED DEVELOPMENT



1 - WestVerdi-Verdi Interchange North, Garson Interchange North, East Verdi Interchange North



LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- ROW Constraint
- Bikepath Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- River Constraint
- Bridge Constraint
- Boundary Lines
- Corridor Limits

CONSTRAINTS AND IMPACT RATINGS - WEST VERDI-VERDI

PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	⊖
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	●
Bridge Constraint	●
ENVIRONMENTAL*	●

CONSTRAINTS AND IMPACT RATINGS - GARSON

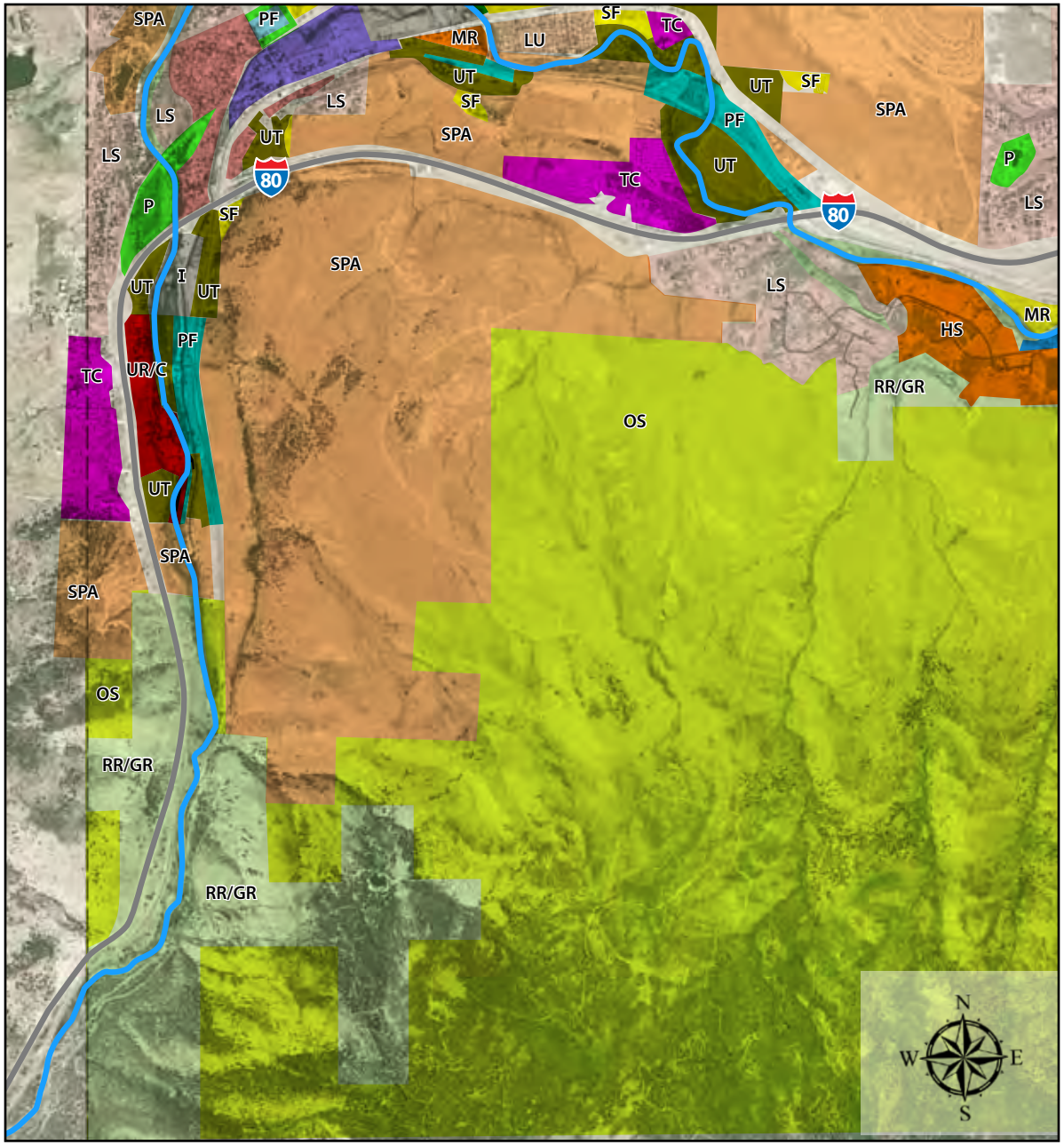
PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	⊖
Railroad Constraint	N/A
River Constraint	N/A
Bridge Constraint	◒
ENVIRONMENTAL*	●

CONSTRAINTS AND IMPACT RATINGS - EAST VERDI-VERDI

PHYSICAL	
Slope, Rock & Embankment	⊖
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	⊖
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	⊖

* See page 45-49 for details.

2 - WestVerdi-Verdi Interchange South, Garson Interchange South, East Verdi Interchange South



LEGEND: I-80 River Boundary Lines Corridor Limits

ECONOMIC VALUES - WEST VERDI-VERDI

- Market ◒
- Attractiveness ◒
- Employment ●
- Developable Land ○

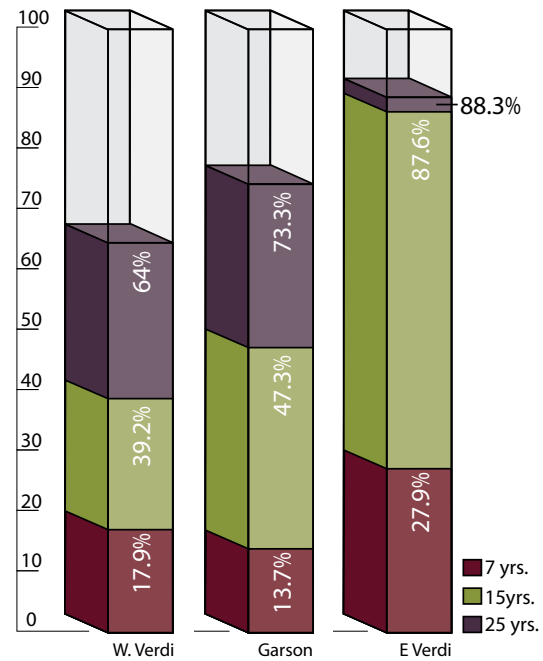
ECONOMIC VALUES - GARSON

- Market ◒
- Attractiveness ◒
- Employment ●
- Developable Land ○

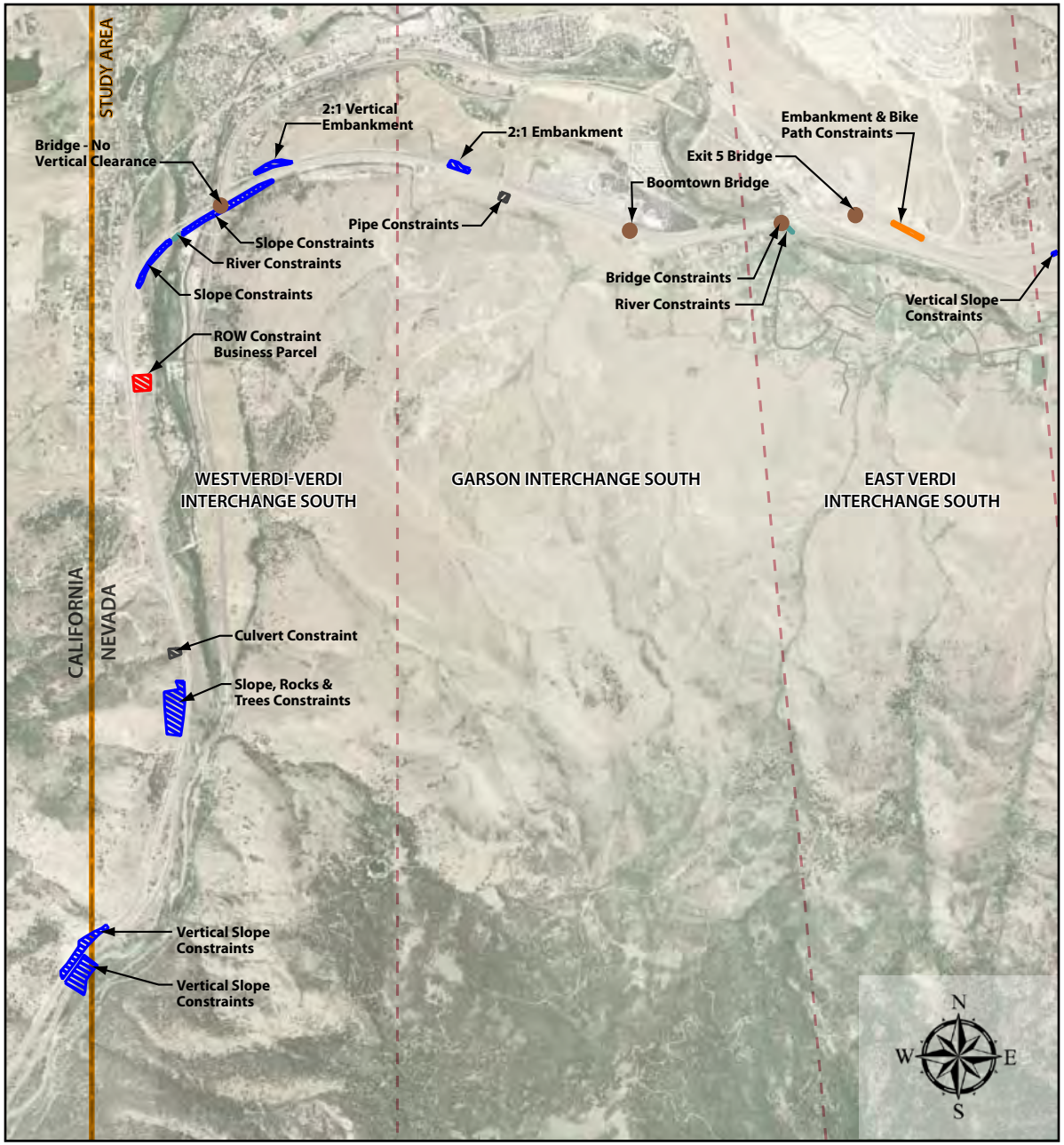
ECONOMIC VALUES - EAST VERDI-VERDI

- Market ◒
- Attractiveness ◒
- Employment ●
- Developable Land ○

REALIZED DEVELOPMENT



2 - WestVerdi-Verdi Interchange South, Garson Interchange South, East Verdi Interchange South



LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- ROW Constraint
- Bikepath Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- River Constraint
- Bridge Constraint
- Boundary Lines
- Corridor Limits

CONSTRAINTS AND IMPACT RATINGS - WEST VERDI-VERDI

PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	⊖
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	●
Bridge Constraint	●
ENVIRONMENTAL*	●

CONSTRAINTS AND IMPACT RATINGS - GARSON

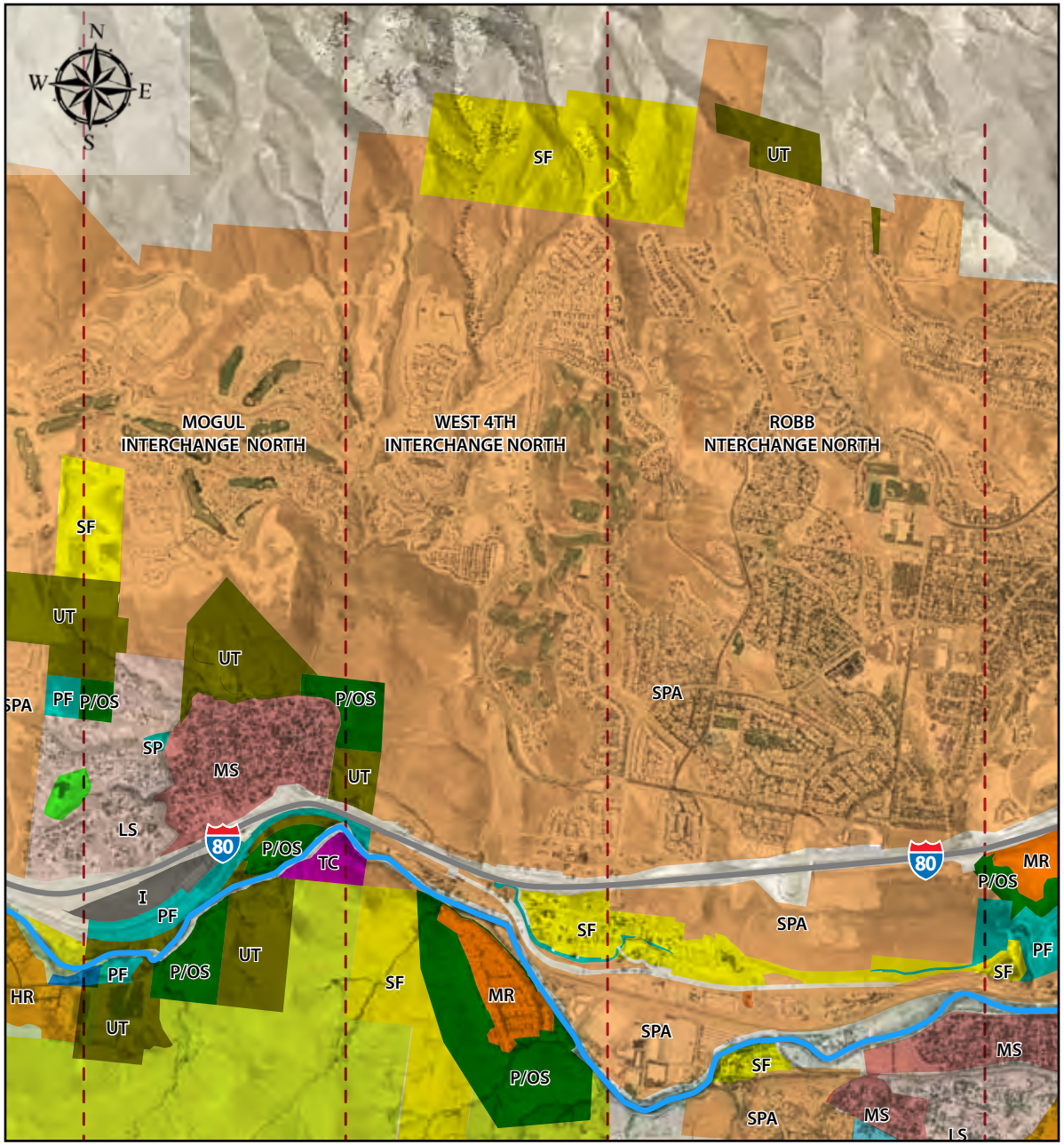
PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	⊖
Railroad Constraint	N/A
River Constraint	N/A
Bridge Constraint	◒
ENVIRONMENTAL*	◒

CONSTRAINTS AND IMPACT RATINGS - EAST VERDI-VERDI

PHYSICAL	
Slope, Rock & Embankment	⊖
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	⊖
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	●

* See page 45-49 for details.

3 - Mogul Interchange North, West 4th Interchange North, Rob Interchange North



ECONOMIC VALUES - MOGUL

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

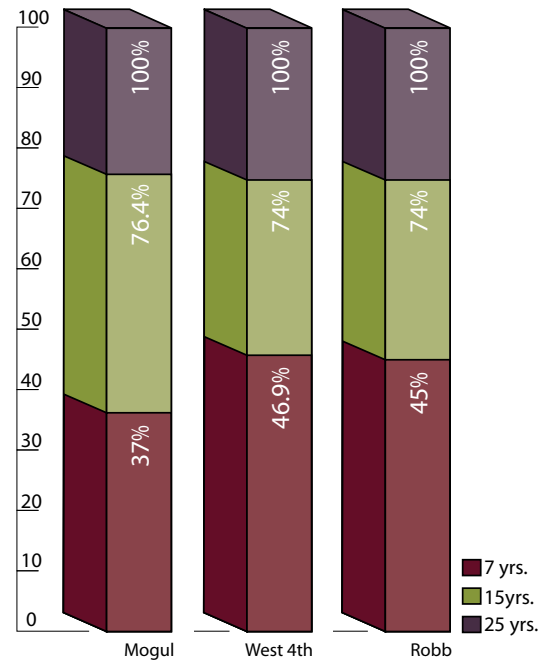
ECONOMIC VALUES - WEST 4TH

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

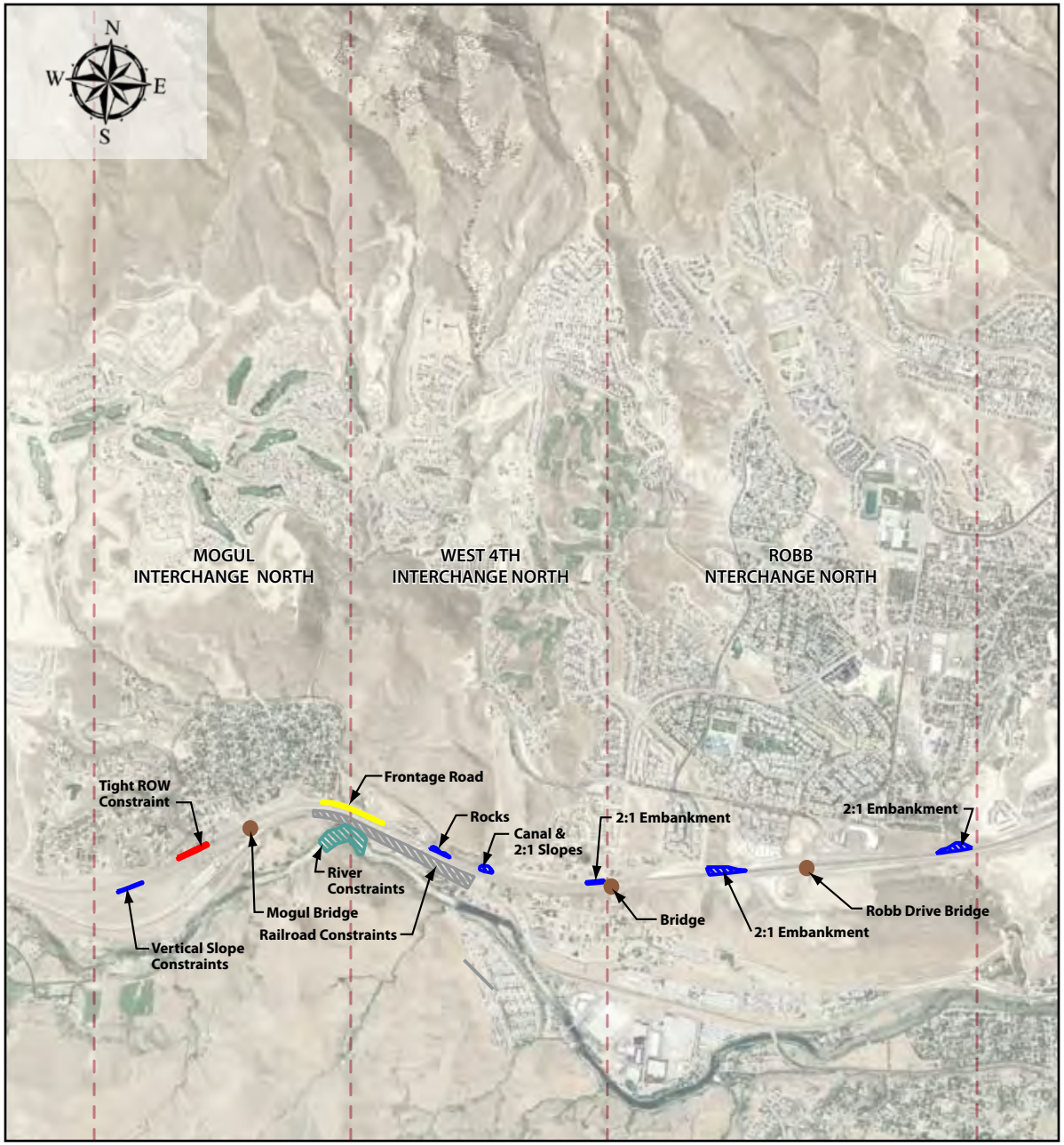
ECONOMIC VALUES - ROBB

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

REALIZED DEVELOPMENT



3 - Mogul Interchange North, West 4th Interchange North, Rob Interchange North



LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- ROW Constraint
- Bikepath Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- River Constraint
- Bridge Constraint
- Boundary Lines
- Corridor Limits

CONSTRAINTS AND IMPACT RATINGS - MOGUL

PHYSICAL	
Slope, Rock & Embankment	⊖
Frontage Road Constraint	◒
ROW Constraint	◒
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	●
ENVIRONMENTAL*	⊖

CONSTRAINTS AND IMPACT RATINGS - WEST 4TH

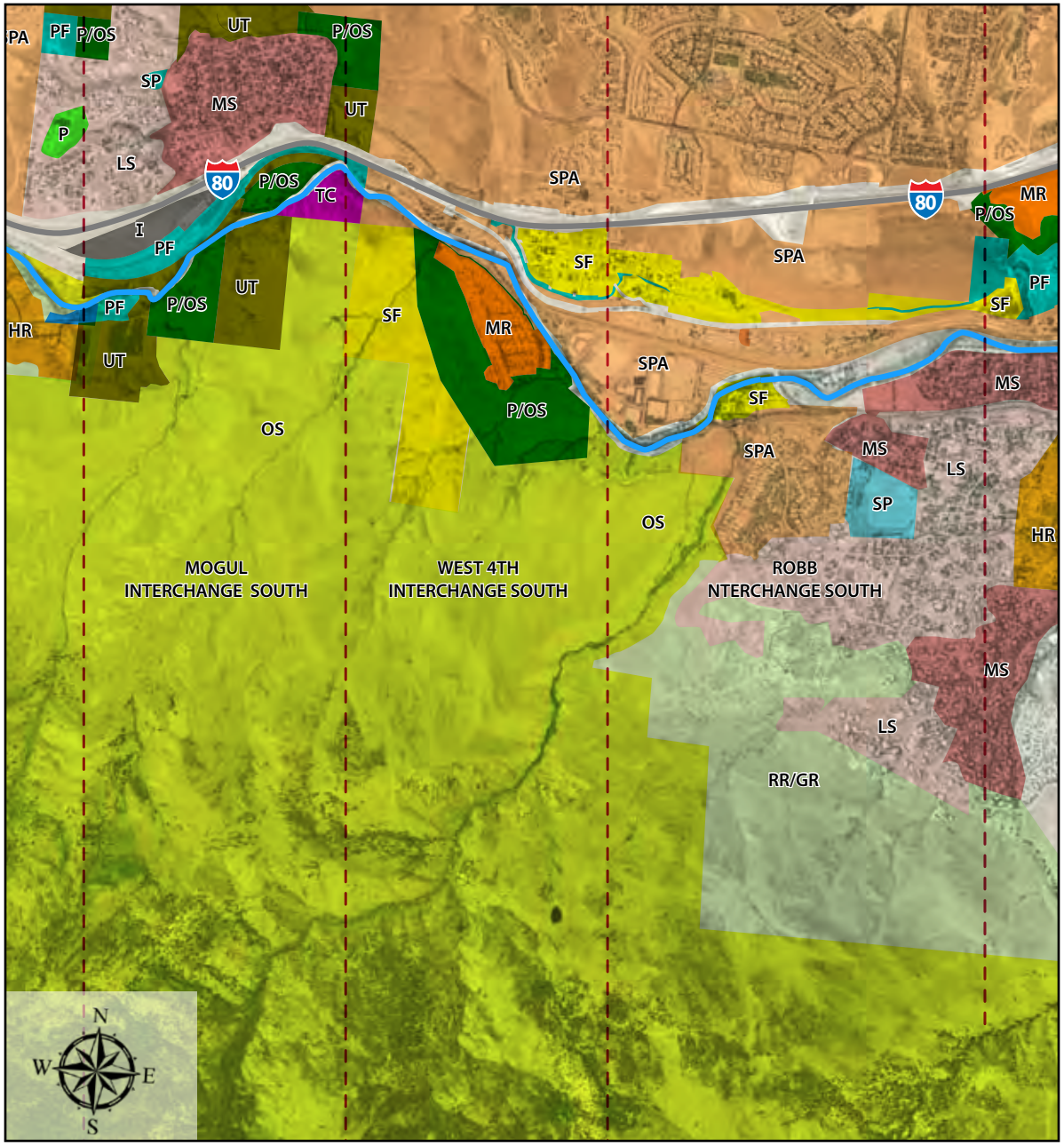
PHYSICAL	
Slope, Rock & Embankment	⊖
Frontage Road Constraint	◒
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	●
ENVIRONMENTAL*	⊖

CONSTRAINTS AND IMPACT RATINGS - ROBB

PHYSICAL	
Slope, Rock & Embankment	⊖
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	N/A
Bridge Constraint	●
ENVIRONMENTAL*	⊖

* See page 45-49 for details.

4 - Mogul Interchange South, West 4th Interchange South, Rob Interchange South



LEGEND: I-80 River Boundary Lines Corridor Limits

ECONOMIC VALUES - MOGUL

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

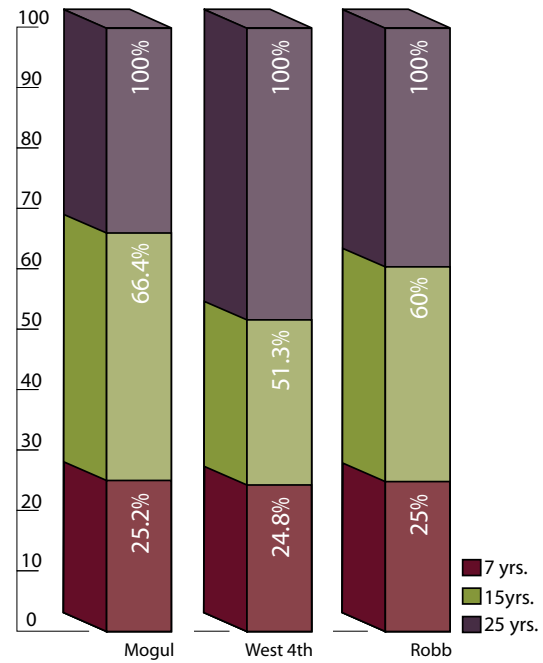
ECONOMIC VALUES - WEST 4TH

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

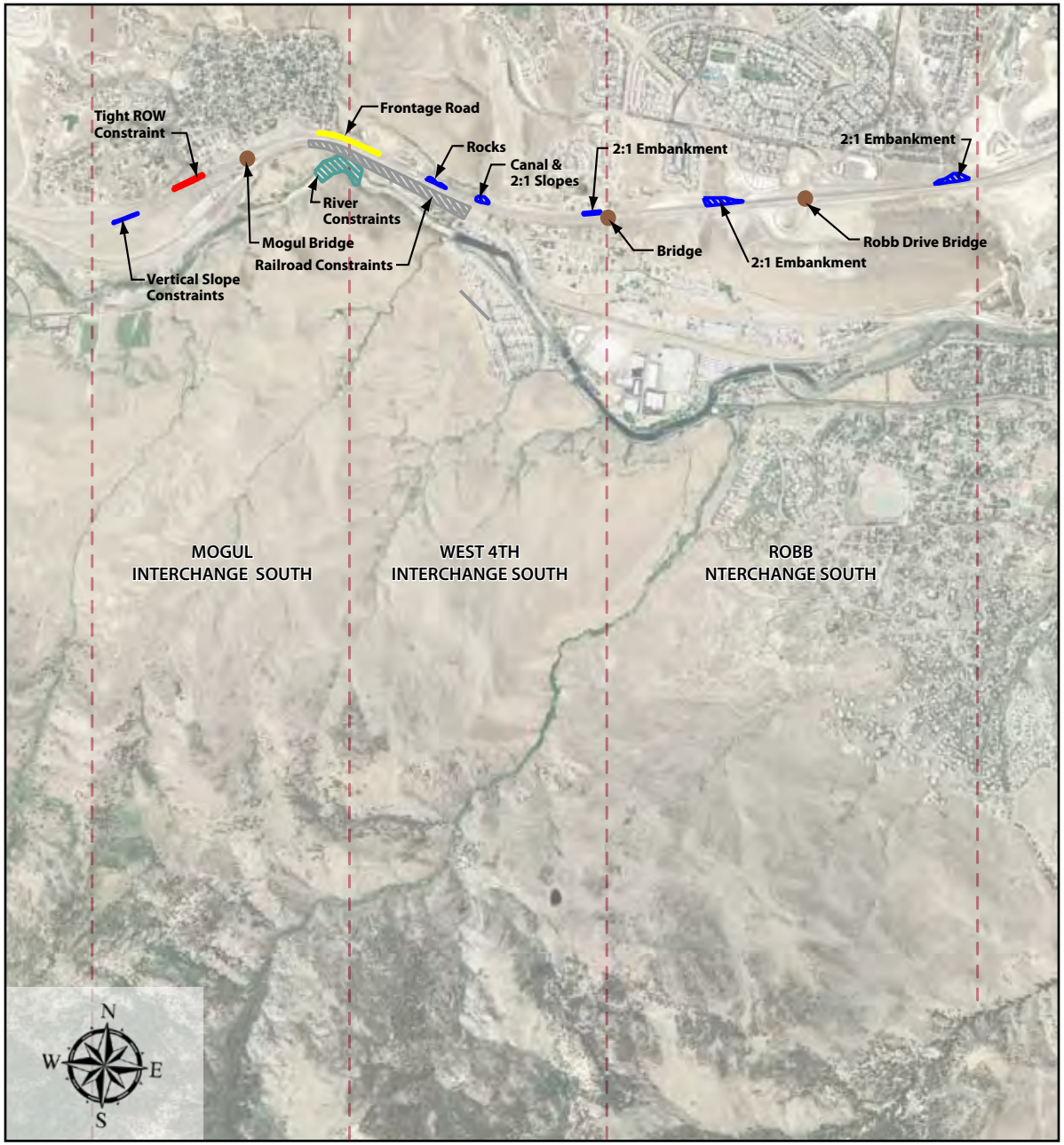
ECONOMIC VALUES - ROBB

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

REALIZED DEVELOPMENT



4 - Mogul Interchange South, West 4th Interchange South, Rob Interchange South



LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- ROW Constraint
- Bikepath Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- River Constraint
- Bridge Constraint
- Boundary Lines
- Corridor Limits

CONSTRAINTS AND IMPACT RATINGS - MOGUL

PHYSICAL	
Slope, Rock & Embankment	⊖
Frontage Road Constraint	◒
ROW Constraint	◒
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	●
ENVIRONMENTAL*	●

CONSTRAINTS AND IMPACT RATINGS - WEST 4TH

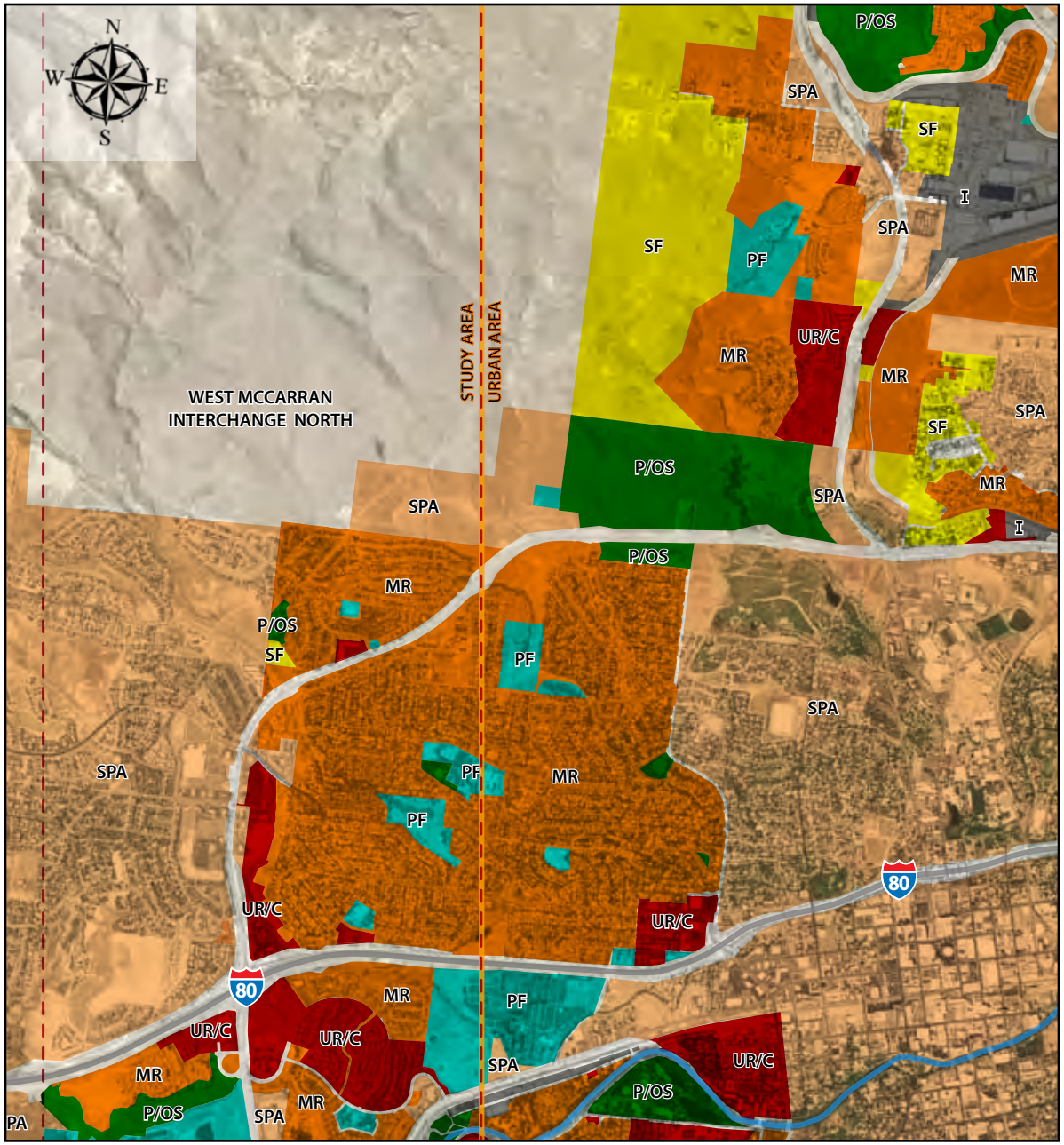
PHYSICAL	
Slope, Rock & Embankment	⊖
Frontage Road Constraint	◒
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	●
ENVIRONMENTAL*	●

CONSTRAINTS AND IMPACT RATINGS - ROBB

PHYSICAL	
Slope, Rock & Embankment	⊖
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	N/A
Bridge Constraint	●
ENVIRONMENTAL*	⊖

* See page 45-49 for details.

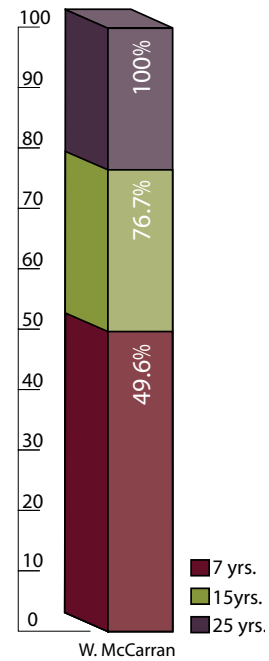
5 - West McCarran Interchange North



ECONOMIC VALUES - WEST McCARRAN

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

REALIZED DEVELOPMENT



5 - West McCarran Interchange North

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- ROW Constraint
- Bikepath Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- River Constraint
- Bridge Constraint
- Boundary Lines
- Corridor Limits

CONSTRAINTS AND IMPACT RATINGS - WEST McCARRAN

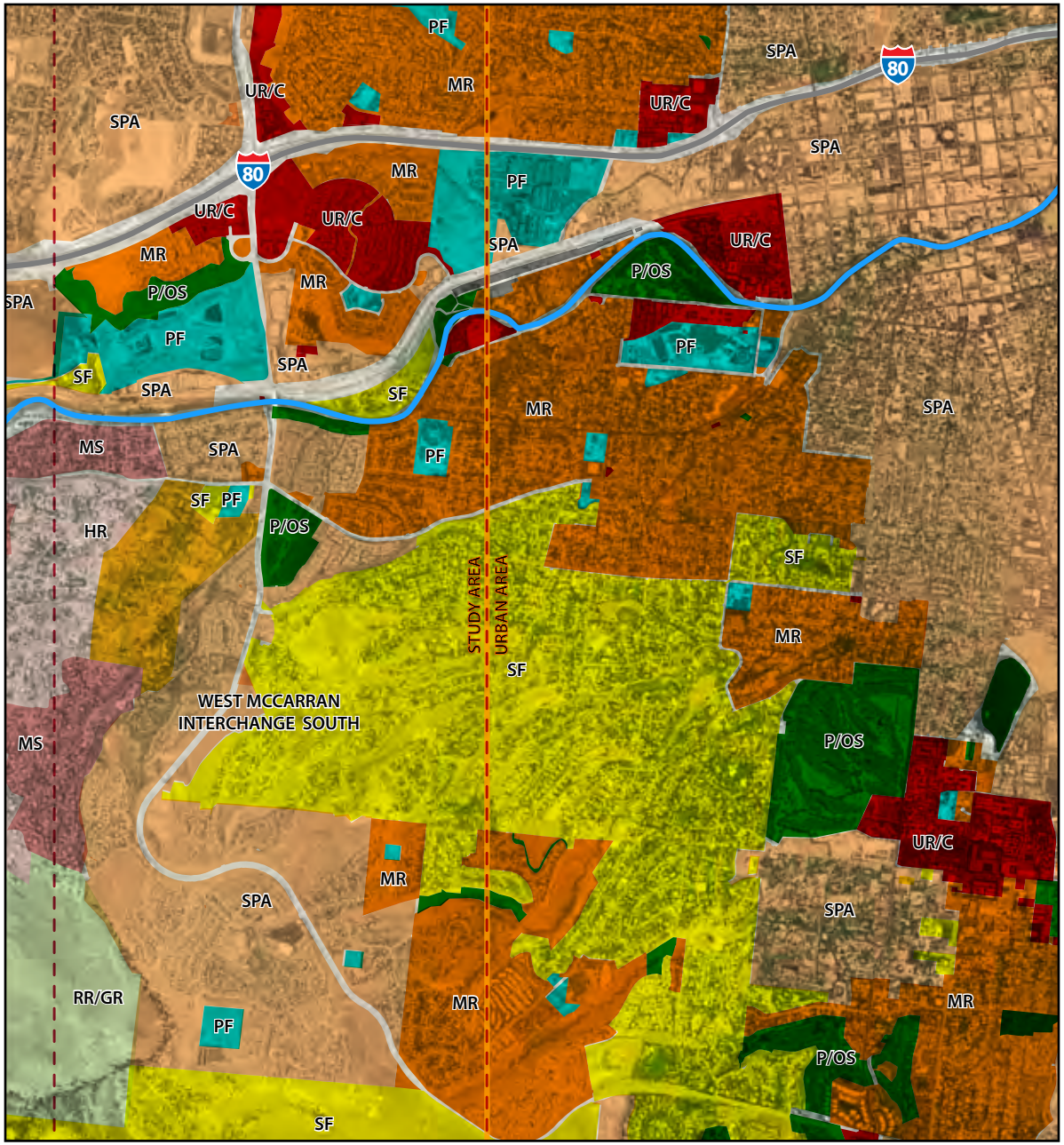
PHYSICAL

Slope, Rock & Embankment	⊖
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	N/A
Bridge Constraint	N/A

ENVIRONMENTAL* ○

* See page 45-49 for details.

6 - West McCarran Interchange South

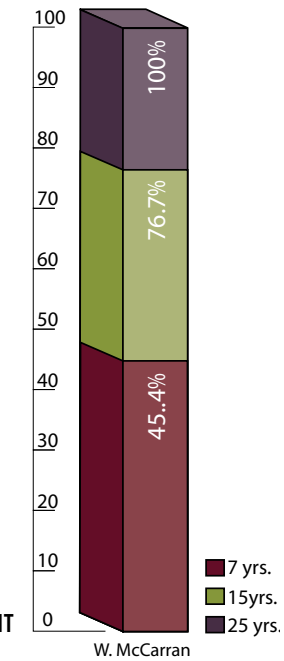


LEGEND: I-80 River Boundary Lines Corridor Limits

ECONOMIC VALUES - WEST McCARRAN

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

REALIZED DEVELOPMENT



6 - West McCarran Interchange South

LEGEND:

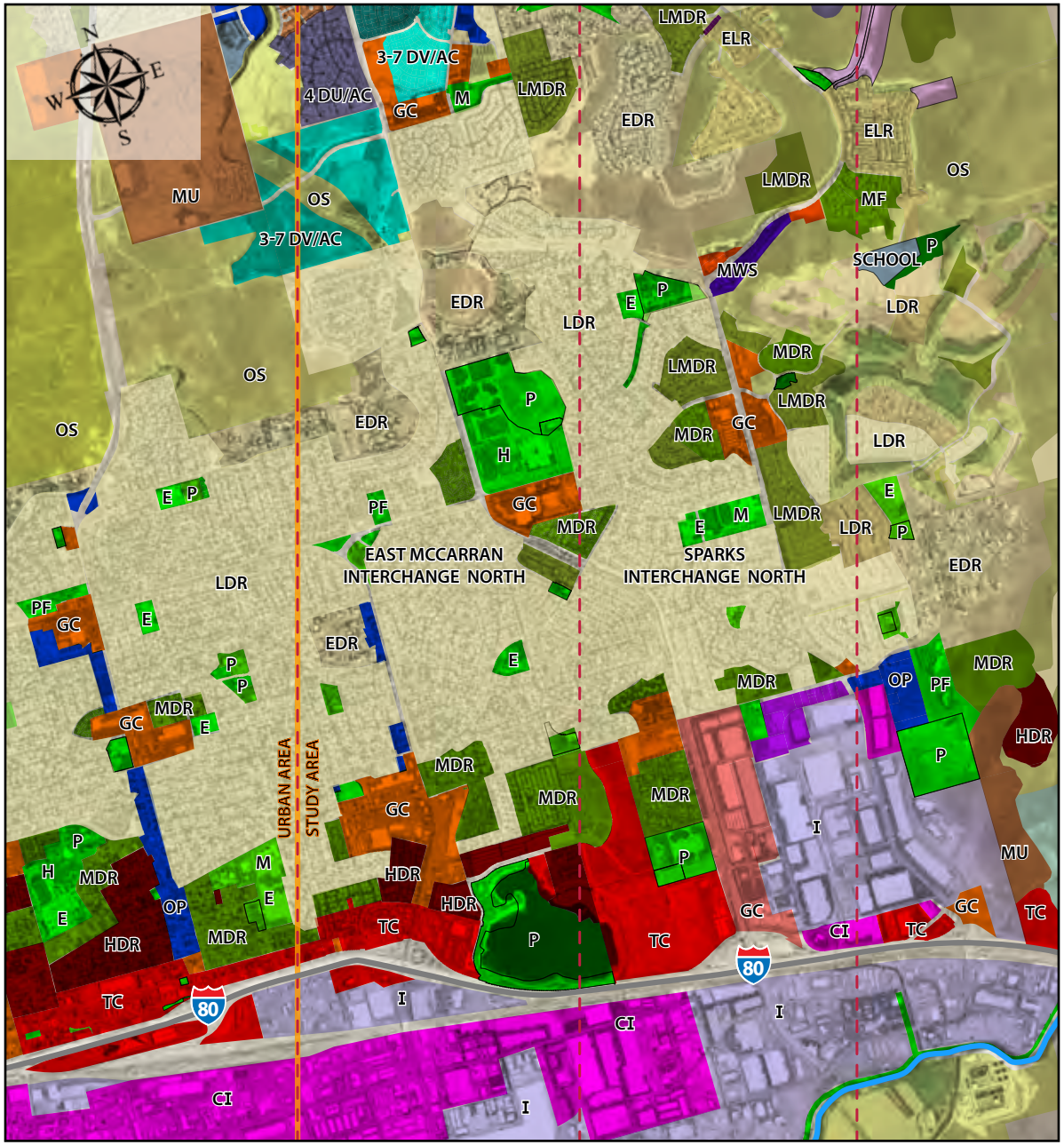
- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- ROW Constraint
- Bikepath Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- River Constraint
- Bridge Constraint
- Boundary Lines
- Corridor Limits

CONSTRAINTS AND IMPACT RATINGS - WEST McCARRAN

PHYSICAL	
Slope, Rock & Embankment	⊖
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	N/A
Bridge Constraint	N/A
ENVIRONMENTAL*	⊖

* See page 45-49 for details.

7 - East McCarran Interchange North, Sparks Interchange North



LEGEND: I-80 River Boundary Lines Corridor Limits

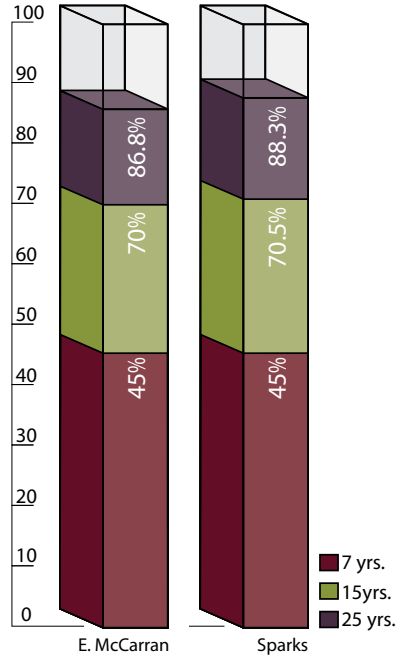
ECONOMIC VALUES - EAST McCARRAN

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

ECONOMIC VALUES - SPARKS

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

REALIZED DEVELOPMENT



7 - East McCarran Interchange North, Sparks Interchange North

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- ROW Constraint
- Bikepath Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- River Constraint
- Bridge Constraint
- Boundary Lines
- Corridor Limits

CONSTRAINTS AND IMPACT RATINGS - EAST McCARRAN

PHYSICAL

Slope, Rock & Embankment	N/A
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	N/A
Bridge Constraint	◒

ENVIRONMENTAL* ○

CONSTRAINTS AND IMPACT RATINGS - SPARKS

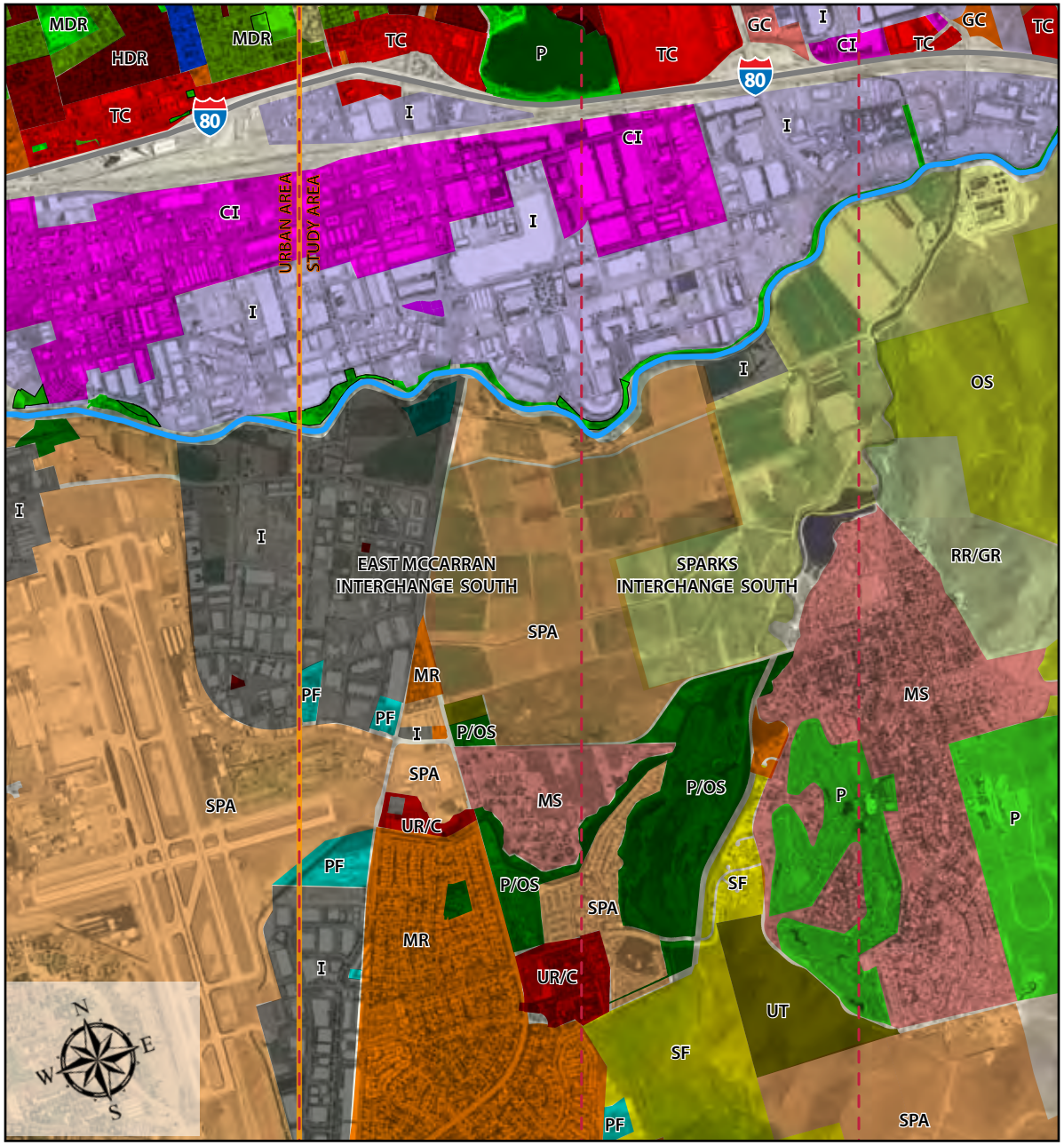
PHYSICAL

Slope, Rock & Embankment	N/A
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	N/A
Bridge Constraint	◒

ENVIRONMENTAL* ⊖

* See page 45-49 for details.

8 - East McCarran Interchange South, Sparks Interchange South



LEGEND: I-80 River Boundary Lines Corridor Limits

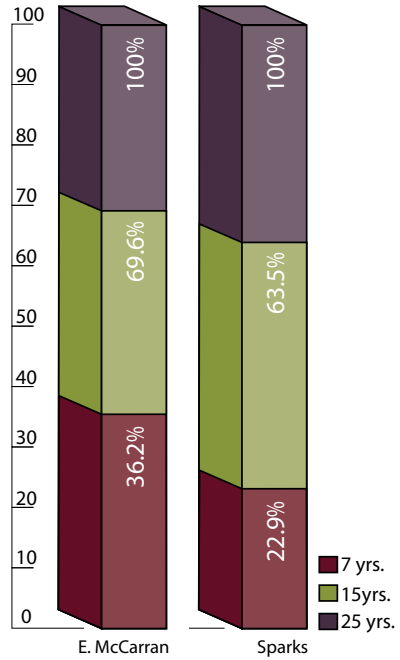
ECONOMIC VALUES - EAST McCARRAN

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

ECONOMIC VALUES - SPARKS

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

REALIZED DEVELOPMENT



8 - East McCarran Interchange South, Sparks Interchange South

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- ROW Constraint
- Bikepath Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- River Constraint
- Bridge Constraint
- Boundary Lines
- Corridor Limits

CONSTRAINTS AND IMPACT RATINGS - EAST McCARRAN

PHYSICAL

Slope, Rock & Embankment	N/A
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	N/A
Bridge Constraint	◒

ENVIRONMENTAL* ⊖

CONSTRAINTS AND IMPACT RATINGS - SPARKS

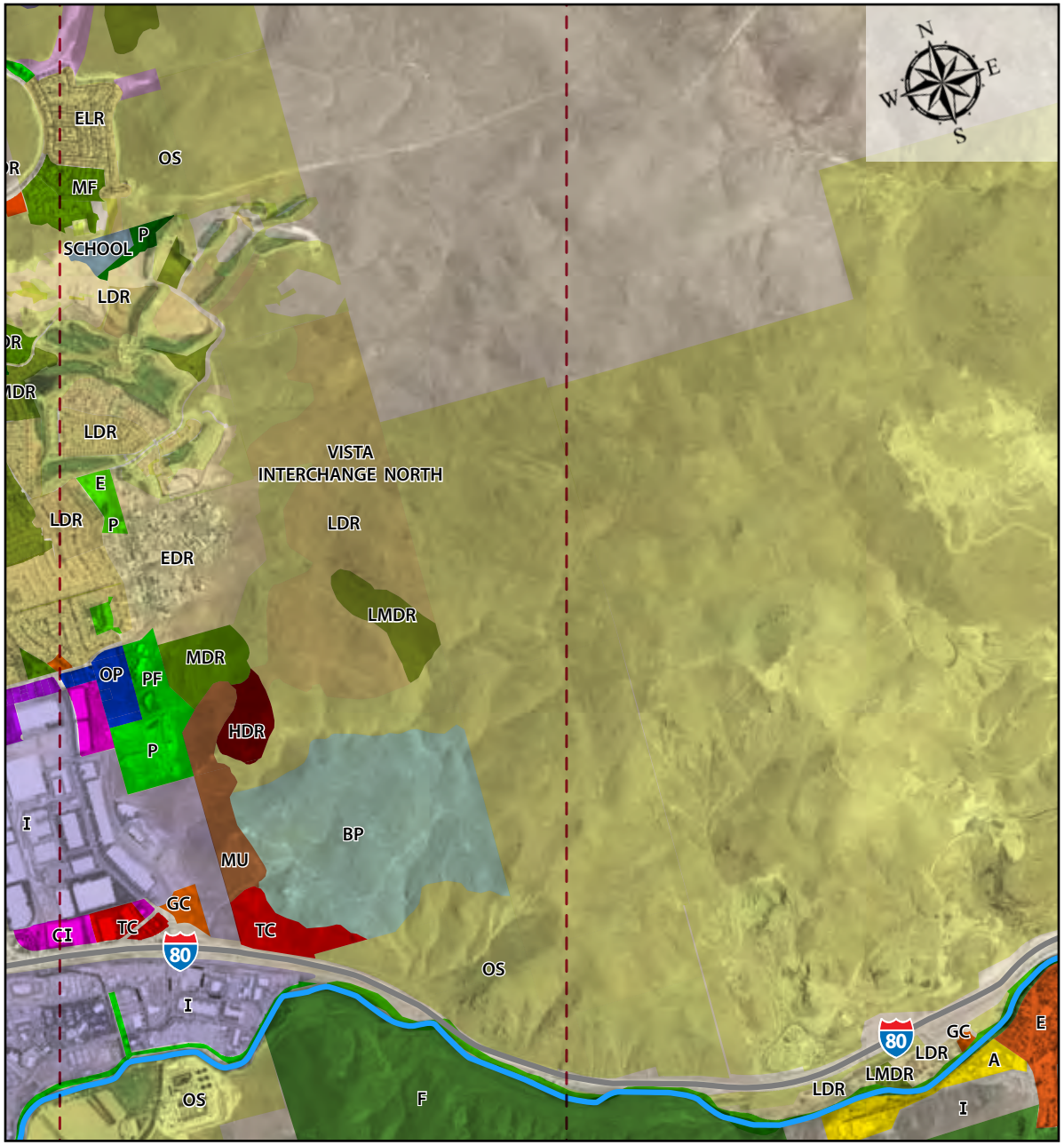
PHYSICAL

Slope, Rock & Embankment	N/A
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	N/A
Bridge Constraint	◒

ENVIRONMENTAL* ⊖

* See page 45-49 for details.

9 - Vista Interchange North

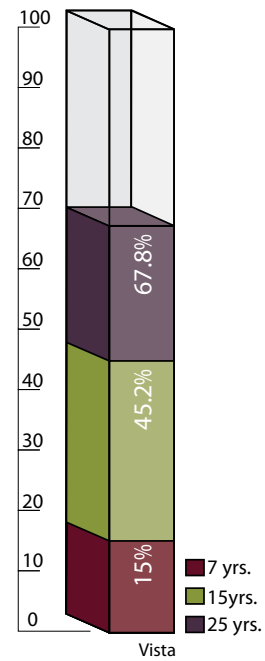


LEGEND: I-80 River Boundary Lines Corridor Limits

ECONOMIC VALUES - VISTA

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

REALIZED DEVELOPMENT



9 - Vista Interchange North

LEGEND:

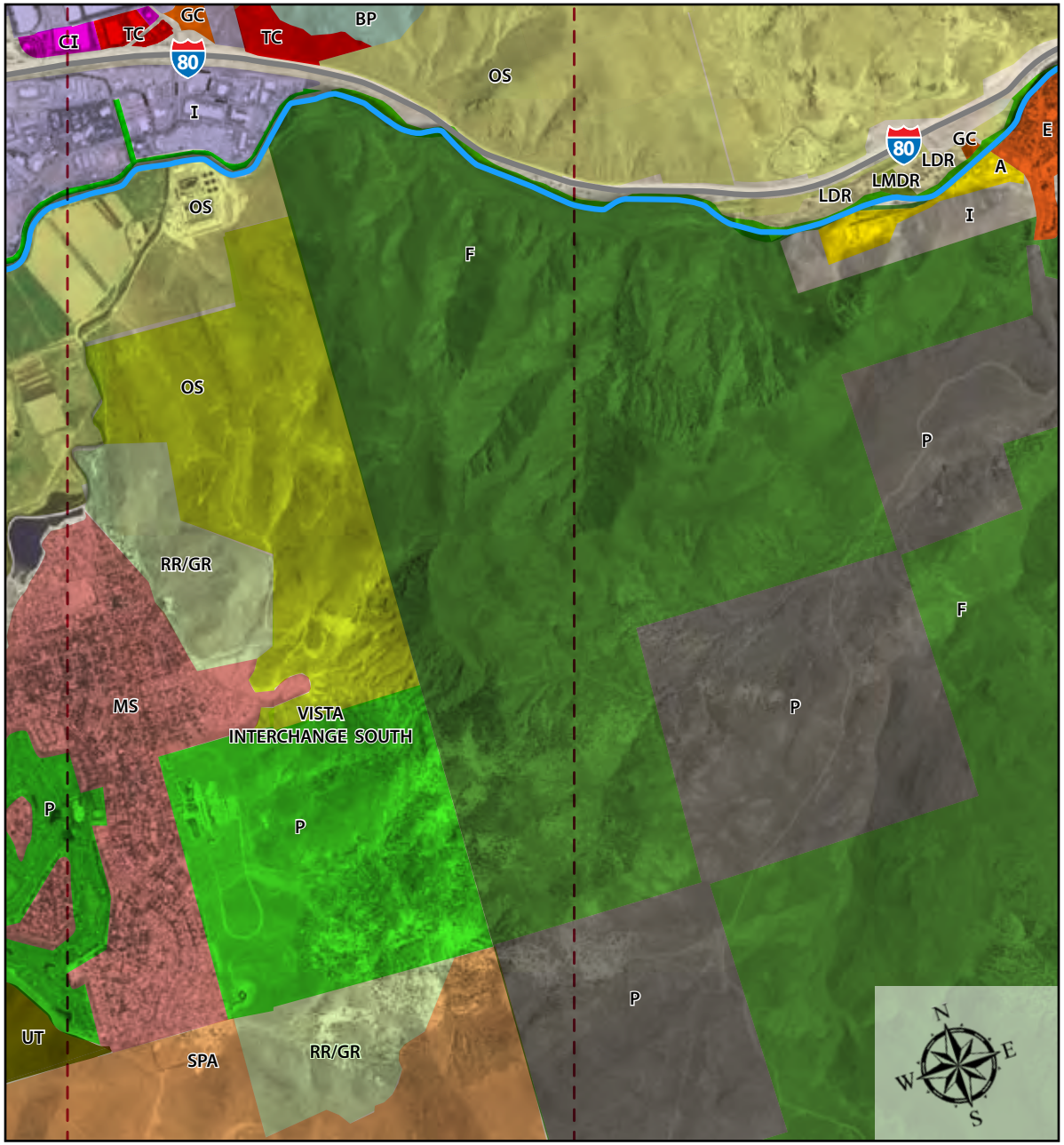
- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- ROW Constraint
- Bikepath Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- River Constraint
- Bridge Constraint
- Boundary Lines
- Corridor Limits

CONSTRAINTS AND IMPACT RATINGS - VISTA

PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	○

* See page 45-49 for details.

10 - Vista Interchange South

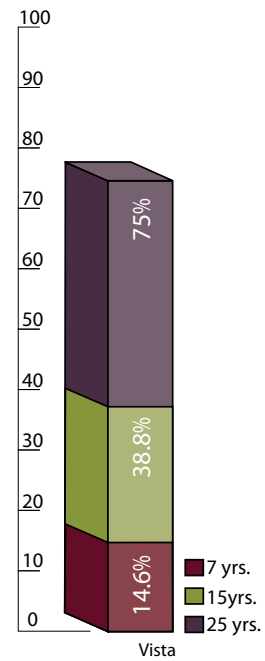


LEGEND: I-80 River Boundary Lines Corridor Limits

ECONOMIC VALUES - VISTA

Market	◒
Attractiveness	◒
Employment	●
Developable Land	○

REALIZED DEVELOPMENT



10 - Vista Interchange South

LEGEND:

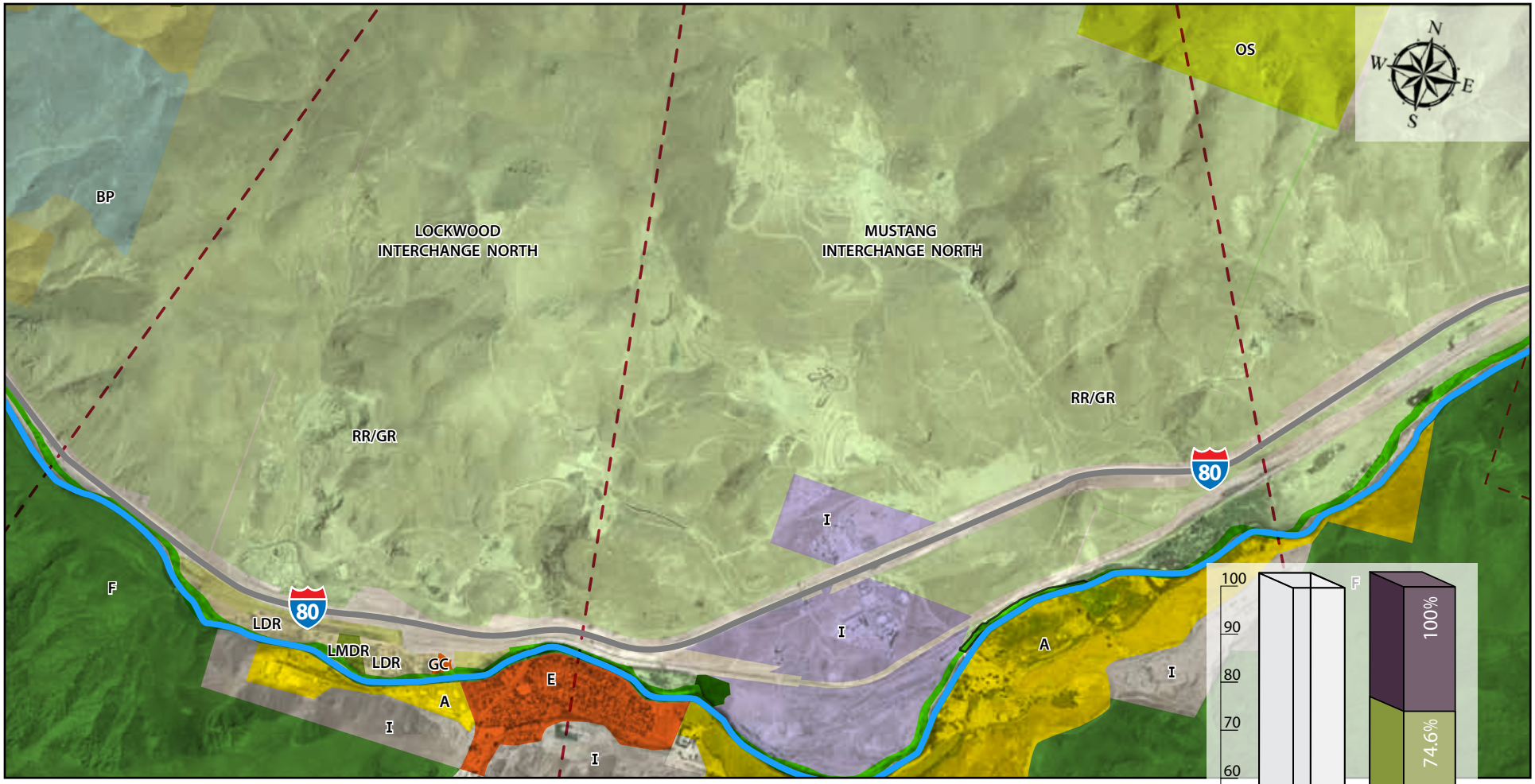
- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- ROW Constraint
- Bikepath Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- River Constraint
- Bridge Constraint
- Boundary Lines
- Corridor Limits

CONSTRAINTS AND IMPACT RATINGS - VISTA

PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	●

* See page 45-49 for details.

11 - Lockwood Interchange North, Mustang Interchange North



LEGEND: I-80 River Boundary Lines Corridor Limits

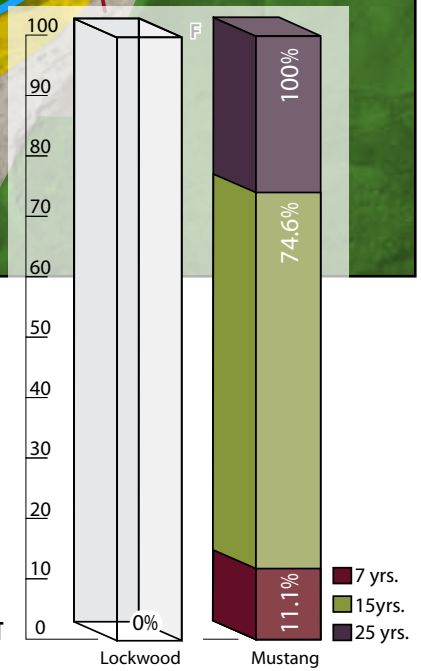
ECONOMIC VALUES - LOCKWOOD

Market	◒
Attractiveness	⊖
Employment	◒
Developable Land	◒

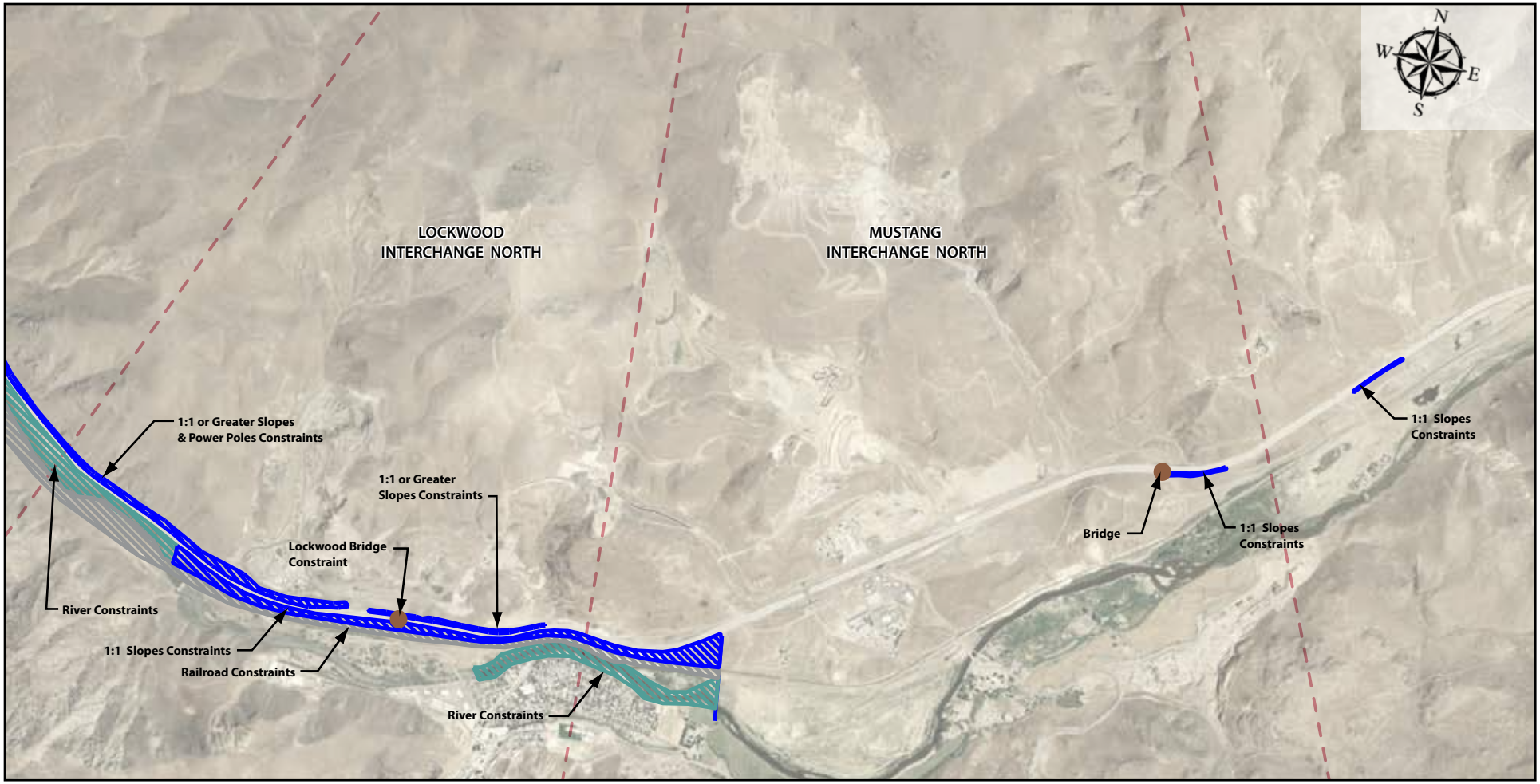
ECONOMIC VALUES - MUSTANG

Market	◒
Attractiveness	⊖
Employment	◒
Developable Land	◒

REALIZED DEVELOPMENT



11 - Lockwood Interchange North, Mustang Interchange North



CONSTRAINTS AND IMPACT RATINGS - LOCKWOOD

PHYSICAL	
Slope, Rock & Embankment	●
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	⊖

CONSTRAINTS AND IMPACT RATINGS - MUSTANG

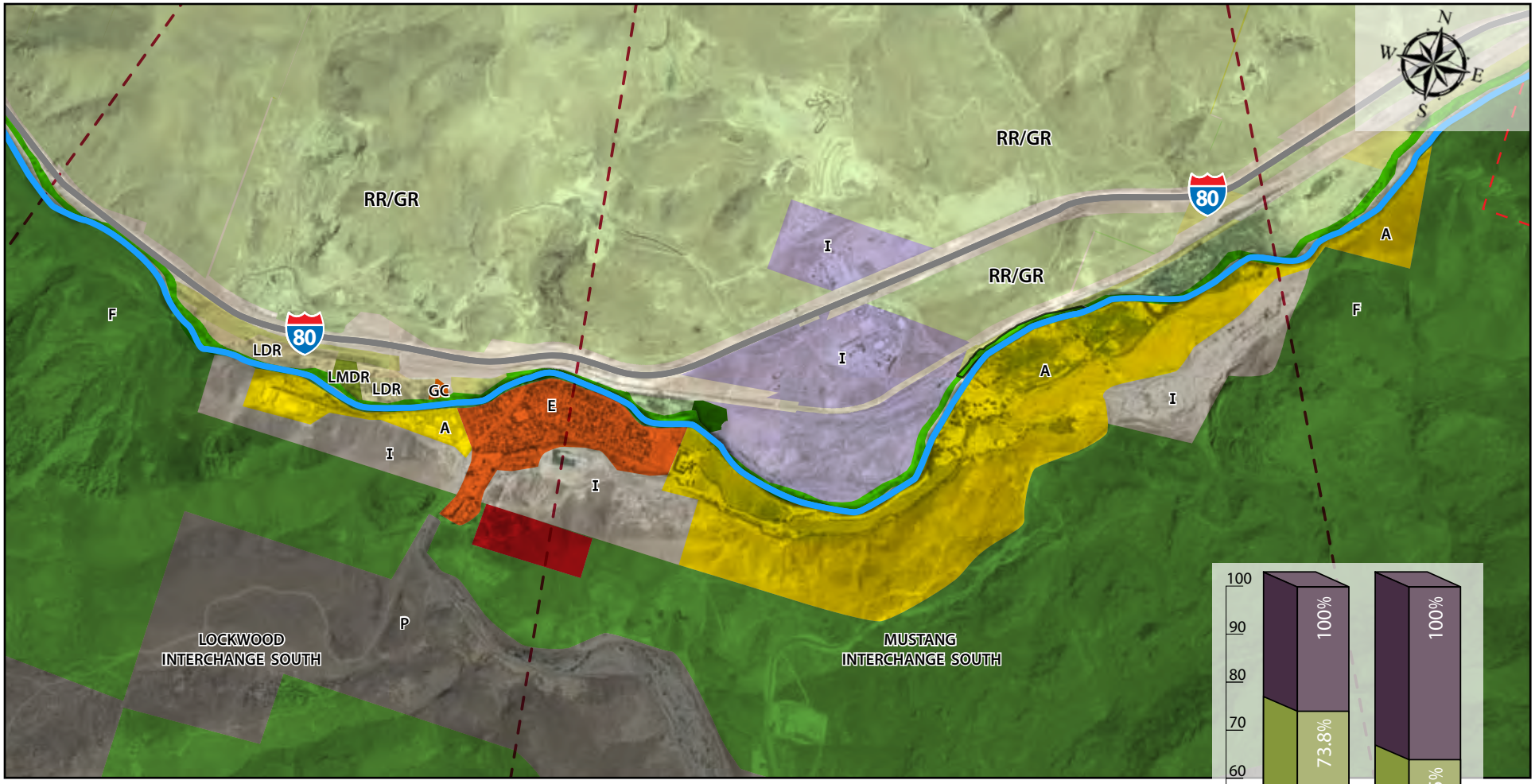
PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	○

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- Boundary Lines
- ROW Constraint
- Bikepath Constraint
- River Constraint
- Bridge Constraint
- Corridor Limits

* See page 45-49 for details.

12 - Lockwood Interchange South, Mustang Interchange South



LEGEND: I-80 River Boundary Lines Corridor Limits

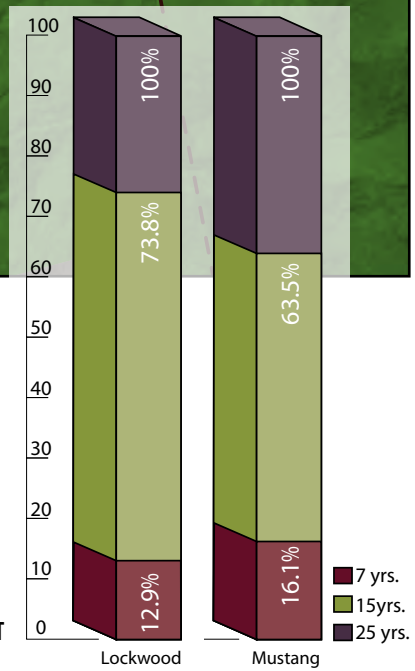
ECONOMIC VALUES - LOCKWOOD

Market	◒
Attractiveness	⊖
Employment	◒
Developable Land	◒

ECONOMIC VALUES - MUSTANG

Market	◒
Attractiveness	⊖
Employment	◒
Developable Land	◒

REALIZED DEVELOPMENT



12 - Lockwood Interchange South, Mustang Interchange South

CONSTRAINTS AND IMPACT RATINGS - LOCKWOOD

PHYSICAL	
Slope, Rock & Embankment	●
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	◒

CONSTRAINTS AND IMPACT RATINGS - MUSTANG

PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	◒

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- Boundary Lines
- ROW Constraint
- Bikepath Constraint
- River Constraint
- Bridge Constraint
- Corridor Limits

* See page 45-49 for details.

13 - Patrick Interchange North

PATRICK
INTERCHANGE NORTH

OS

RR/GR

TC

I

RR/GR

RR/GR

80

5-10 AC/DU

I

80

RR/GR

F

A

A

OS

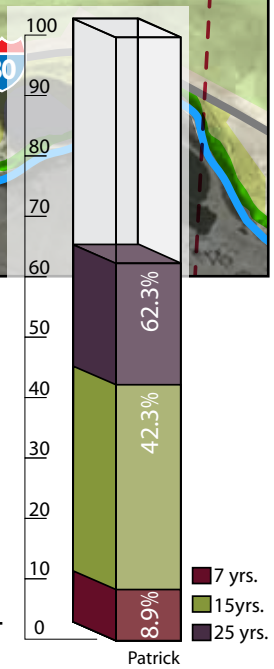
P

LEGEND: I-80 River Boundary Lines Corridor Limits

ECONOMIC VALUES - PATRICK

Market	◒
Attractiveness	⊖
Employment	◒
Developable Land	◒

REALIZED DEVELOPMENT



13 - Patrick Interchange North

CONSTRAINTS AND IMPACT RATINGS - PATRICK

PHYSICAL

Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒

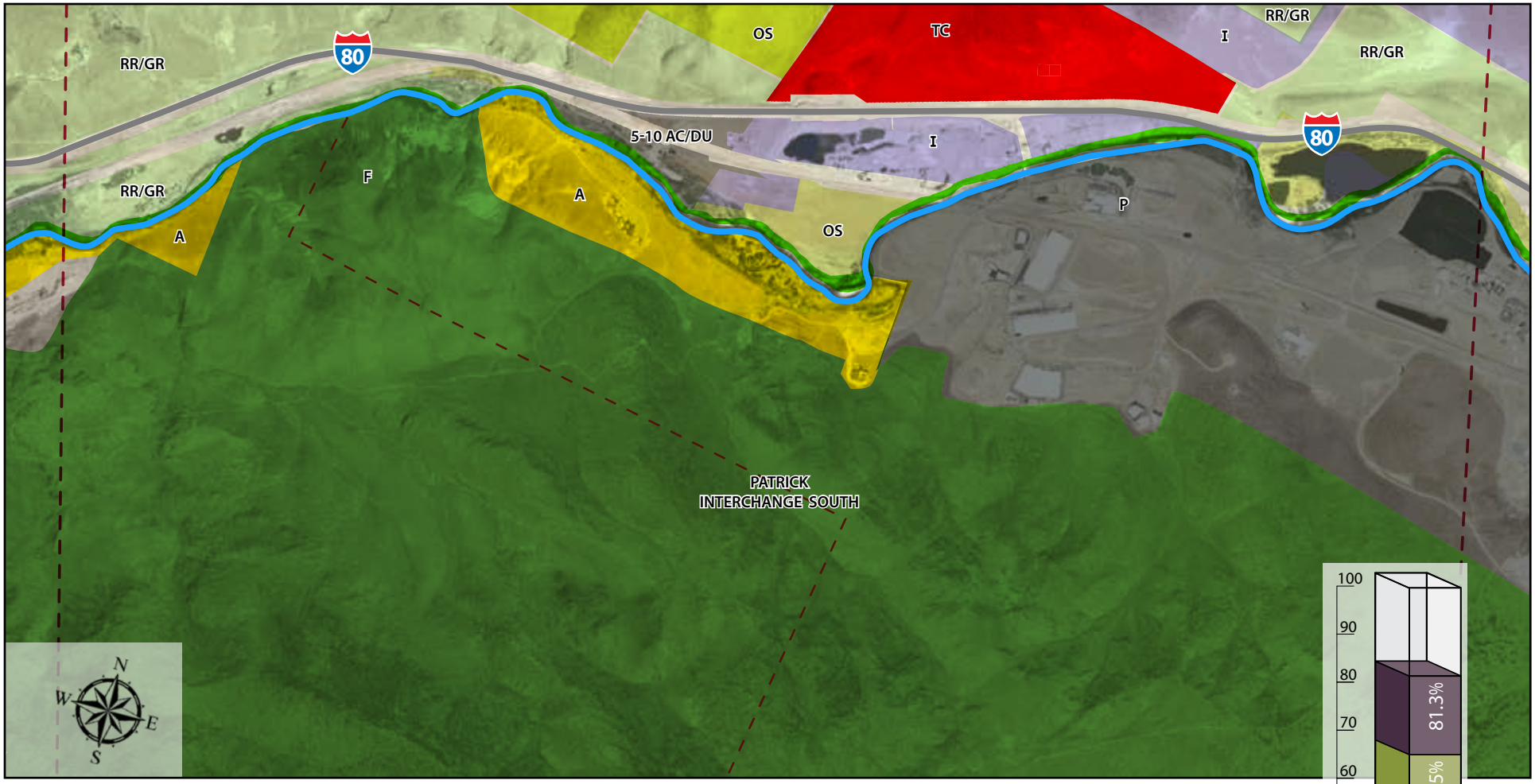
ENVIRONMENTAL* ○

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- Boundary Lines
- ROW Constraint
- Bikepath Constraint
- River Constraint
- Bridge Constraint
- Corridor Limits

* See page 45-49 for details.

14 - Patrick Interchange South

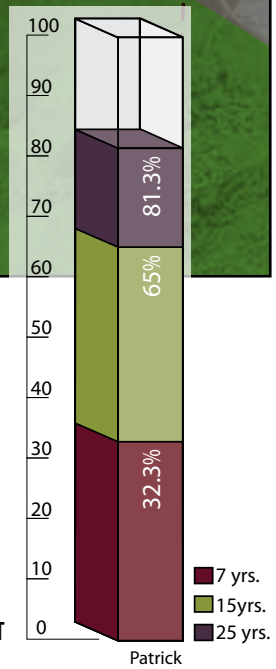


LEGEND: I-80 River Boundary Lines Corridor Limits

ECONOMIC VALUES - PATRICK

Market	◒
Attractiveness	⊖
Employment	◒
Developable Land	◒

REALIZED DEVELOPMENT



14 - Patrick Interchange South

CONSTRAINTS AND IMPACT RATINGS - PATRICK

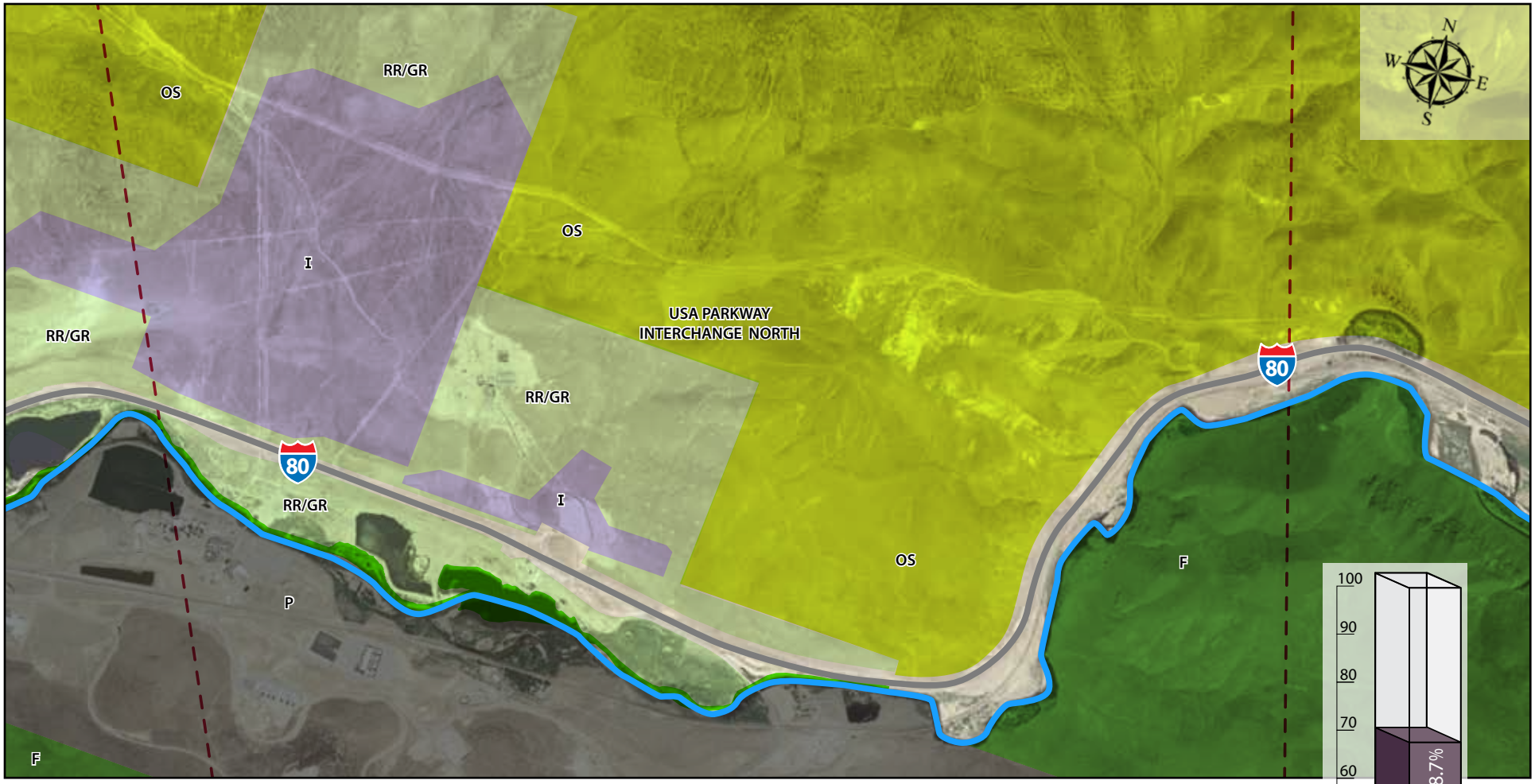
PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	◒

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- Boundary Lines
- ROW Constraint
- Bikepath Constraint
- River Constraint
- Bridge Constraint
- Corridor Limits

* See page 45-49 for details.

15 - USA Parkway Interchange North

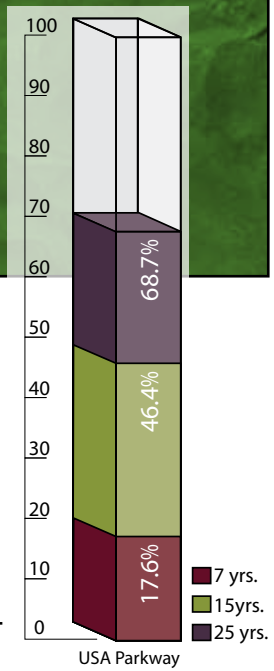


LEGEND: I-80 River Boundary Lines Corridor Limits

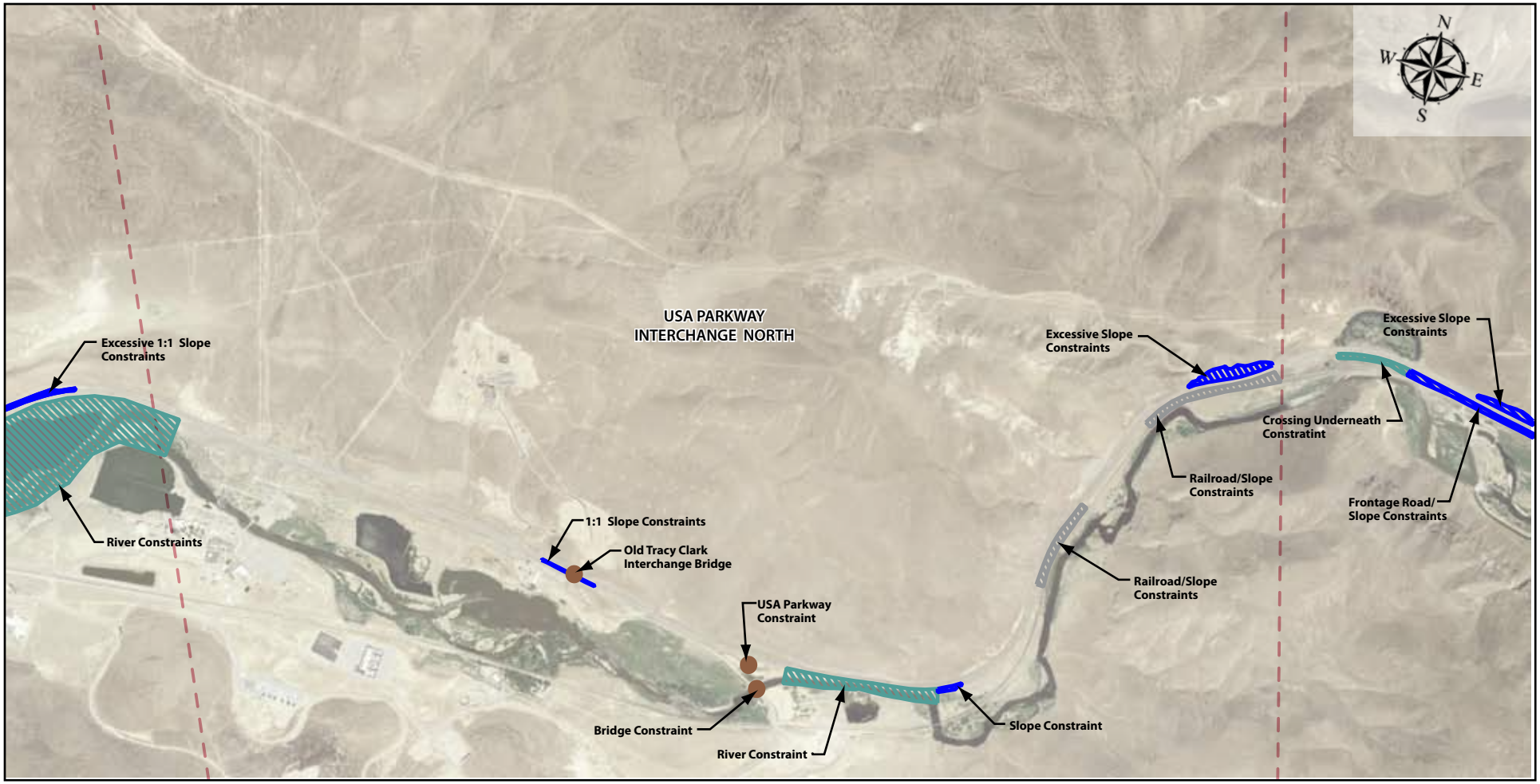
ECONOMIC VALUES - USA PARKWAY

Market	◒
Attractiveness	◒
Employment	◒
Developable Land	◒

REALIZED DEVELOPMENT



15 - USA Parkway Interchange North



CONSTRAINTS AND IMPACT RATINGS - USA PARKWAY

PHYSICAL

Slope, Rock & Embankment	◒
Frontage Road Constraint	◒
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	◒
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒

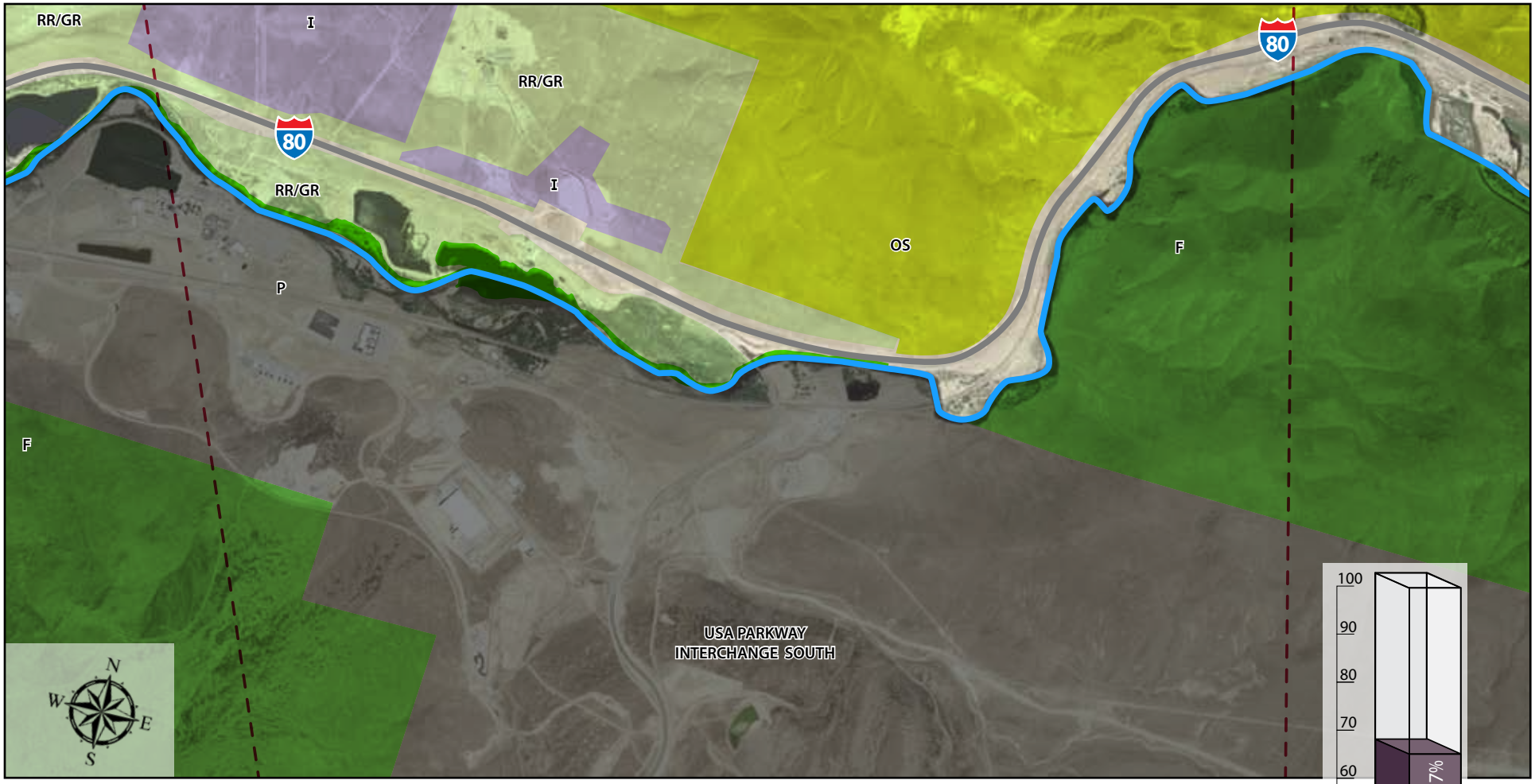
ENVIRONMENTAL* ○

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- Boundary Lines
- ROW Constraint
- Bikepath Constraint
- River Constraint
- Bridge Constraint
- Corridor Limits

* See page 45-49 for details.

16 - USA Parkway Interchange South

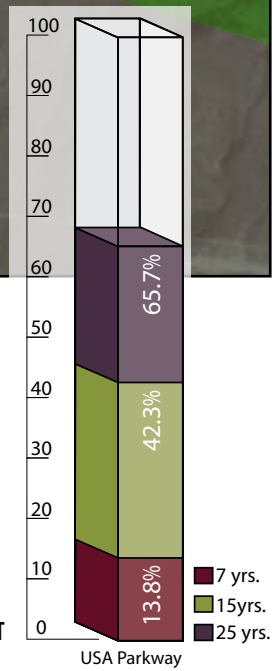


LEGEND: I-80 River Boundary Lines Corridor Limits

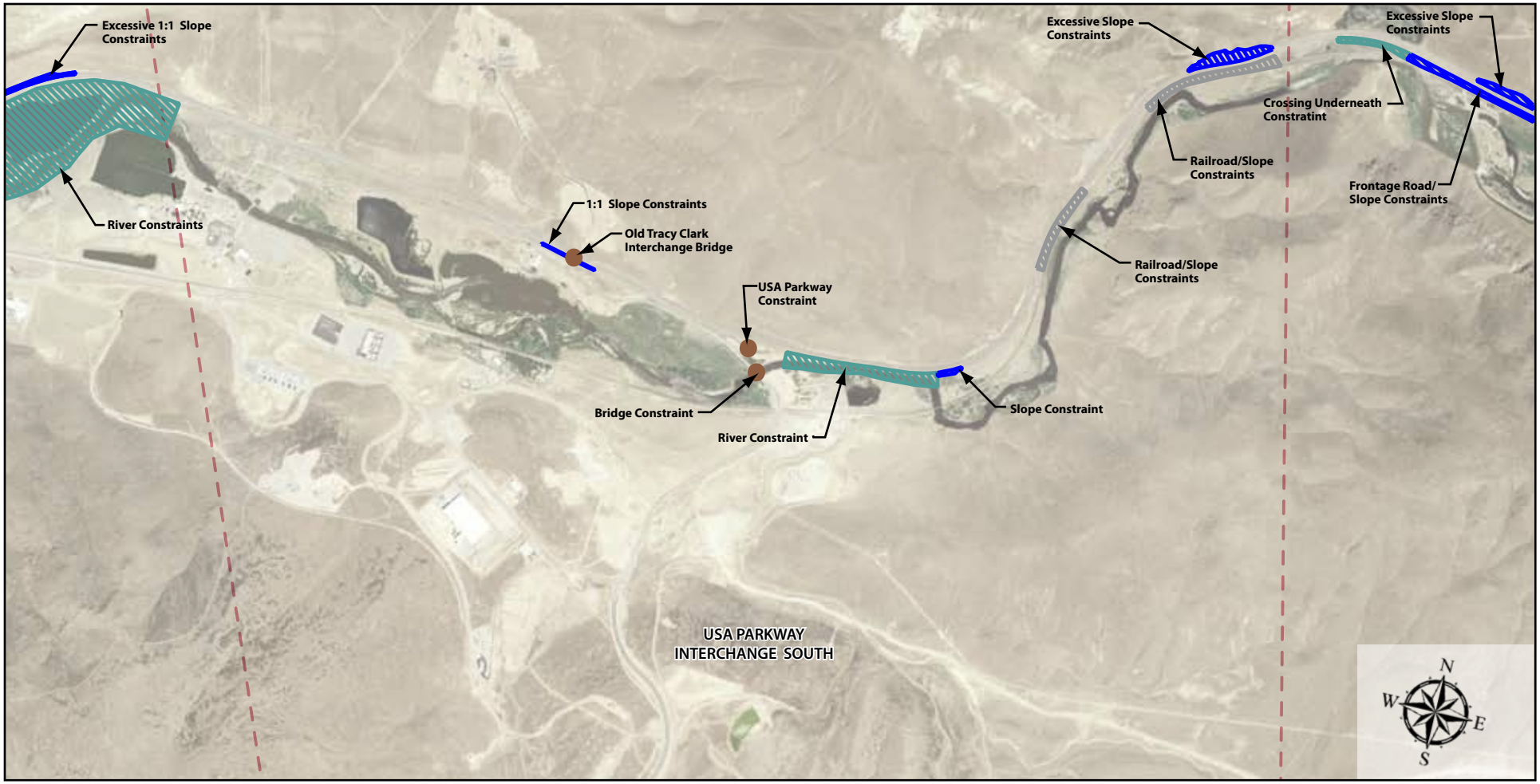
ECONOMIC VALUES - USA PARKWAY

Market	◒
Attractiveness	◒
Employment	◒
Developable Land	◒

REALIZED DEVELOPMENT



16 - USA Parkway Interchange South



CONSTRAINTS AND IMPACT RATINGS - USA PARKWAY

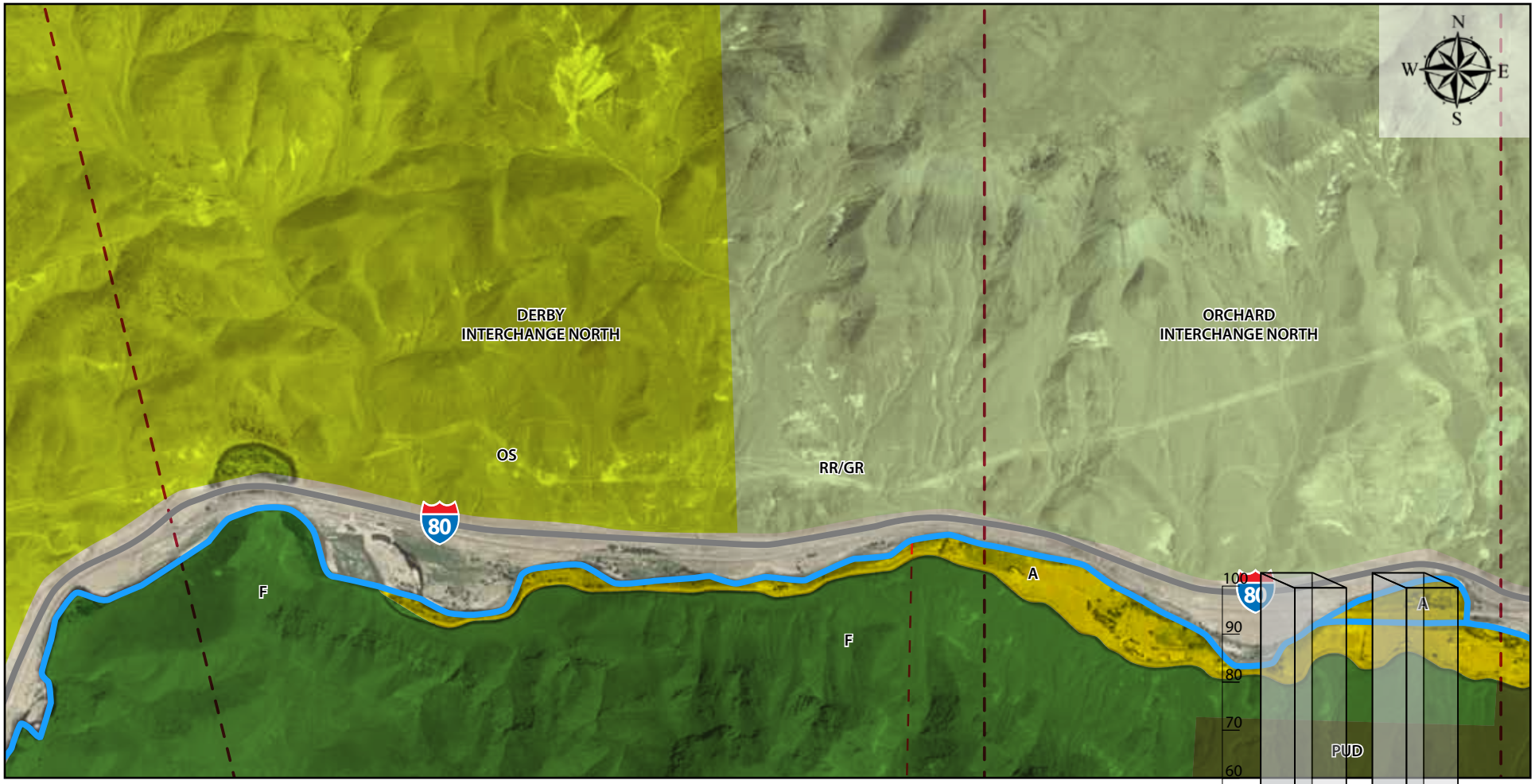
PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	◒
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	◒
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	⊖

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- Boundary Lines
- ROW Constraint
- Bikepath Constraint
- River Constraint
- Bridge Constraint
- Corridor Limits

* See page 45-49 for details.

17 - Derby Interchange North, Orchard Interchange North



LEGEND: I-80 River Boundary Lines Corridor Limits

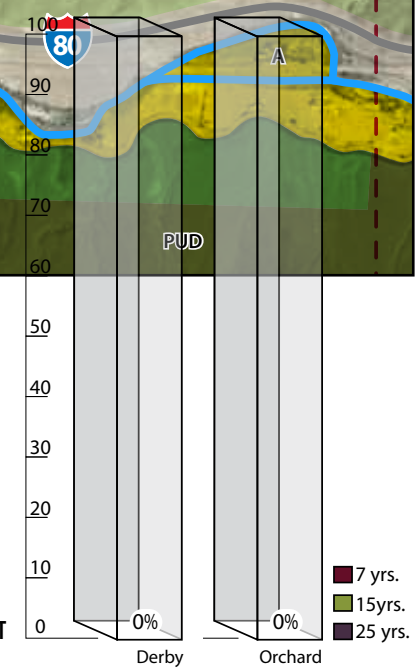
ECONOMIC VALUES - DERBY

Market	◒
Attractiveness	◒
Employment	⊖
Developable Land	◒

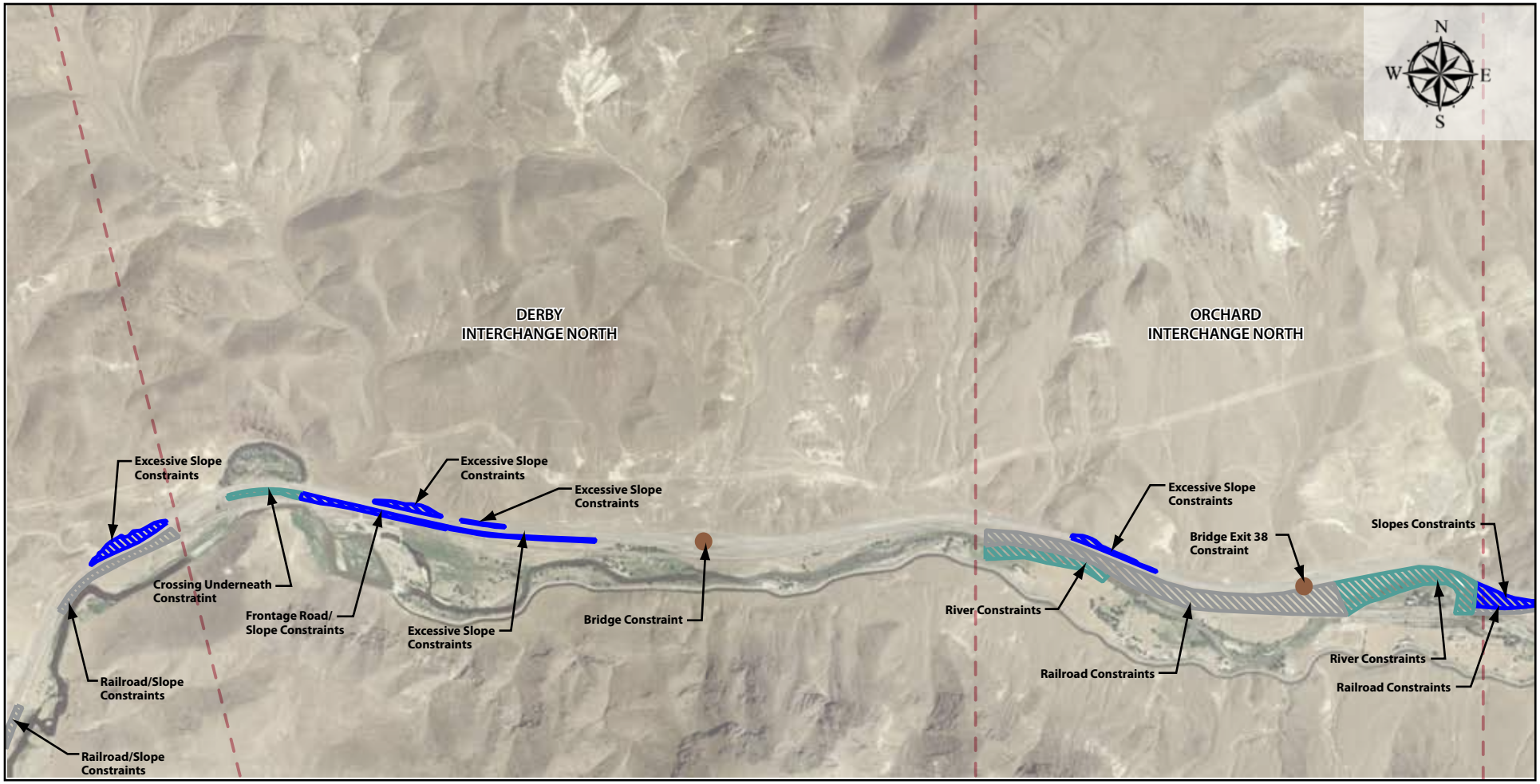
ECONOMIC VALUES - ORCHARD

Market	◒
Attractiveness	◒
Employment	⊖
Developable Land	◒

REALIZED DEVELOPMENT



17 - Derby Interchange North, Orchard Interchange North



CONSTRAINTS AND IMPACT RATINGS - DERBY

PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	◒
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	◒
Railroad Constraint	N/A
River Constraint	◒
Bridge Constraint	◒
ENVIRONMENTAL*	○

CONSTRAINTS AND IMPACT RATINGS - ORCHARD

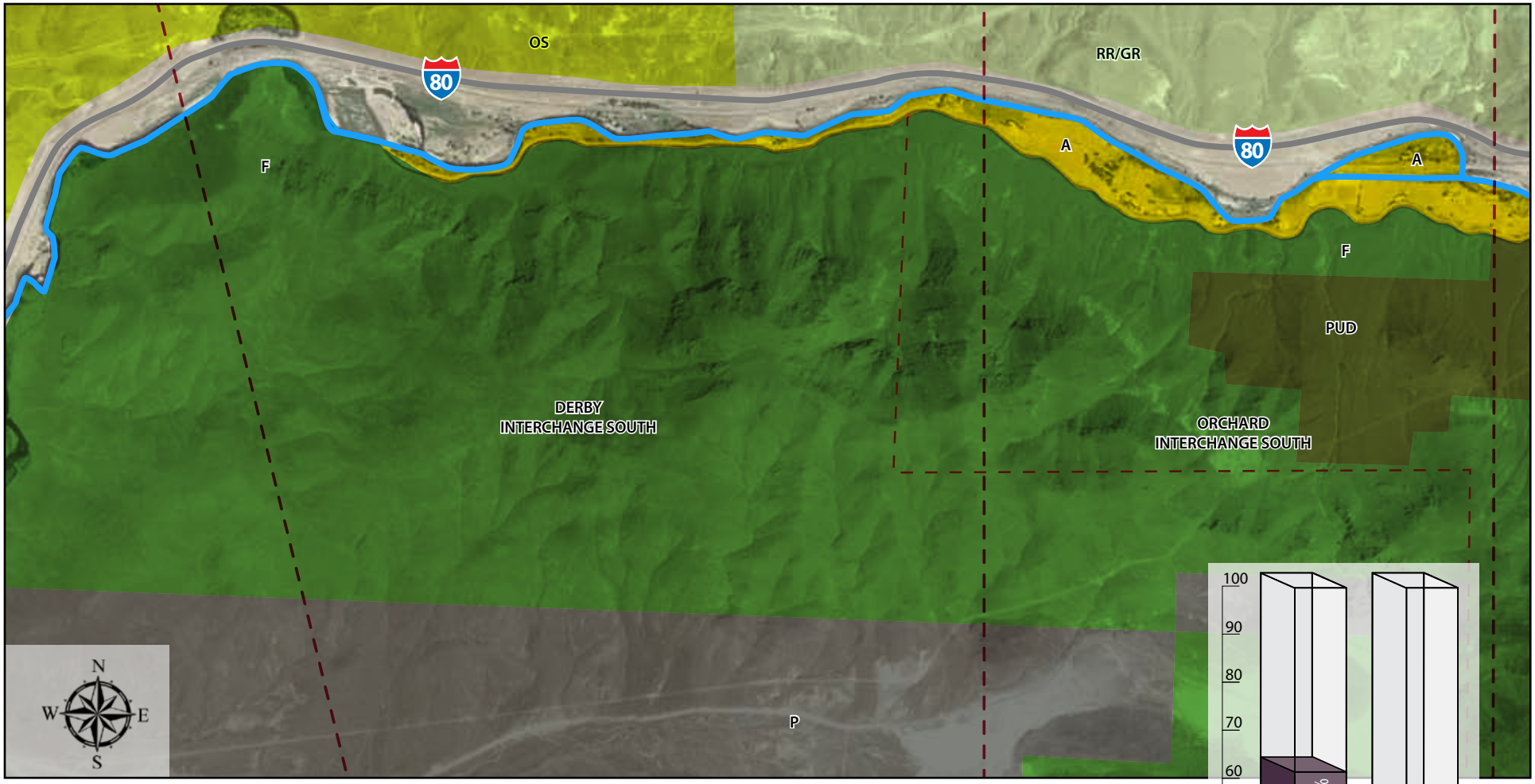
PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	○

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- Boundary Lines
- ROW Constraint
- Bikepath Constraint
- River Constraint
- Bridge Constraint
- Corridor Limits

* See page 45-49 for details.

18 - Derby Interchange South, Orchard Interchange South



LEGEND: I-80 River Boundary Lines Corridor Limits

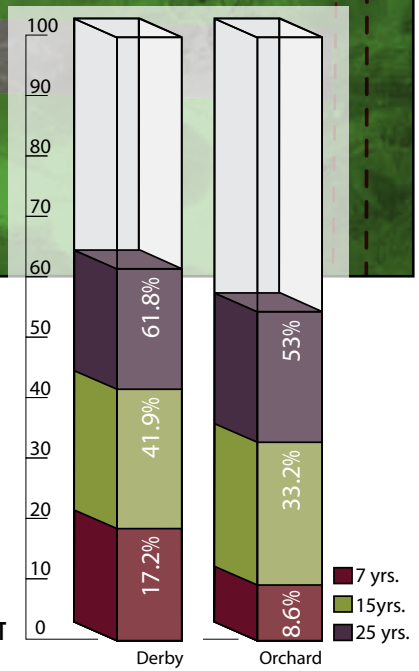
ECONOMIC VALUES - DERBY

Market	◒
Attractiveness	◒
Employment	⊖
Developable Land	◒

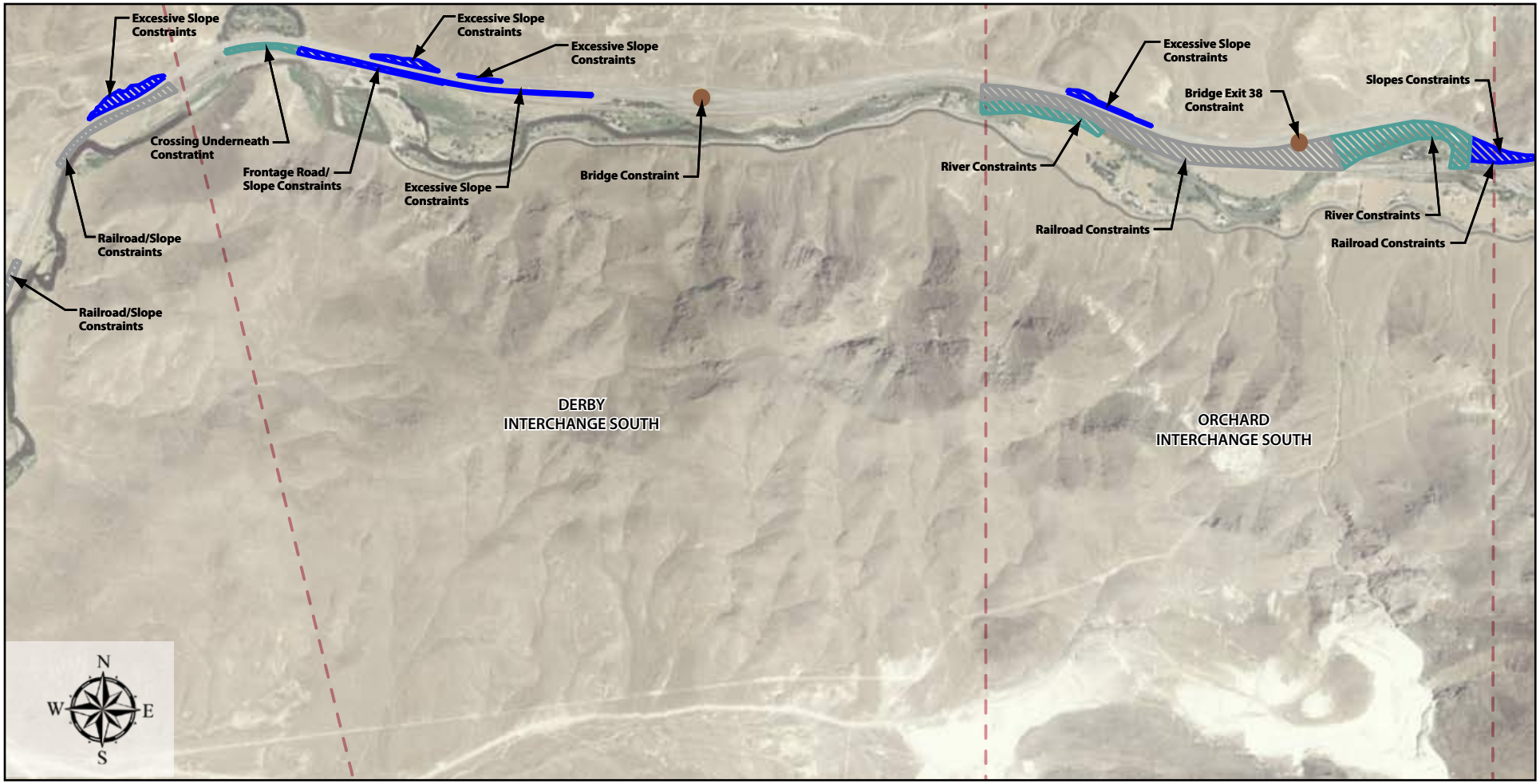
ECONOMIC VALUES - ORCHARD

Market	◒
Attractiveness	◒
Employment	⊖
Developable Land	◒

REALIZED DEVELOPMENT



18 - Derby Interchange South, Orchard Interchange South



CONSTRAINTS AND IMPACT RATINGS - DERBY

PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	◒
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	◒
Railroad Constraint	N/A
River Constraint	◒
Bridge Constraint	◒
ENVIRONMENTAL*	●

CONSTRAINTS AND IMPACT RATINGS - ORCHARD

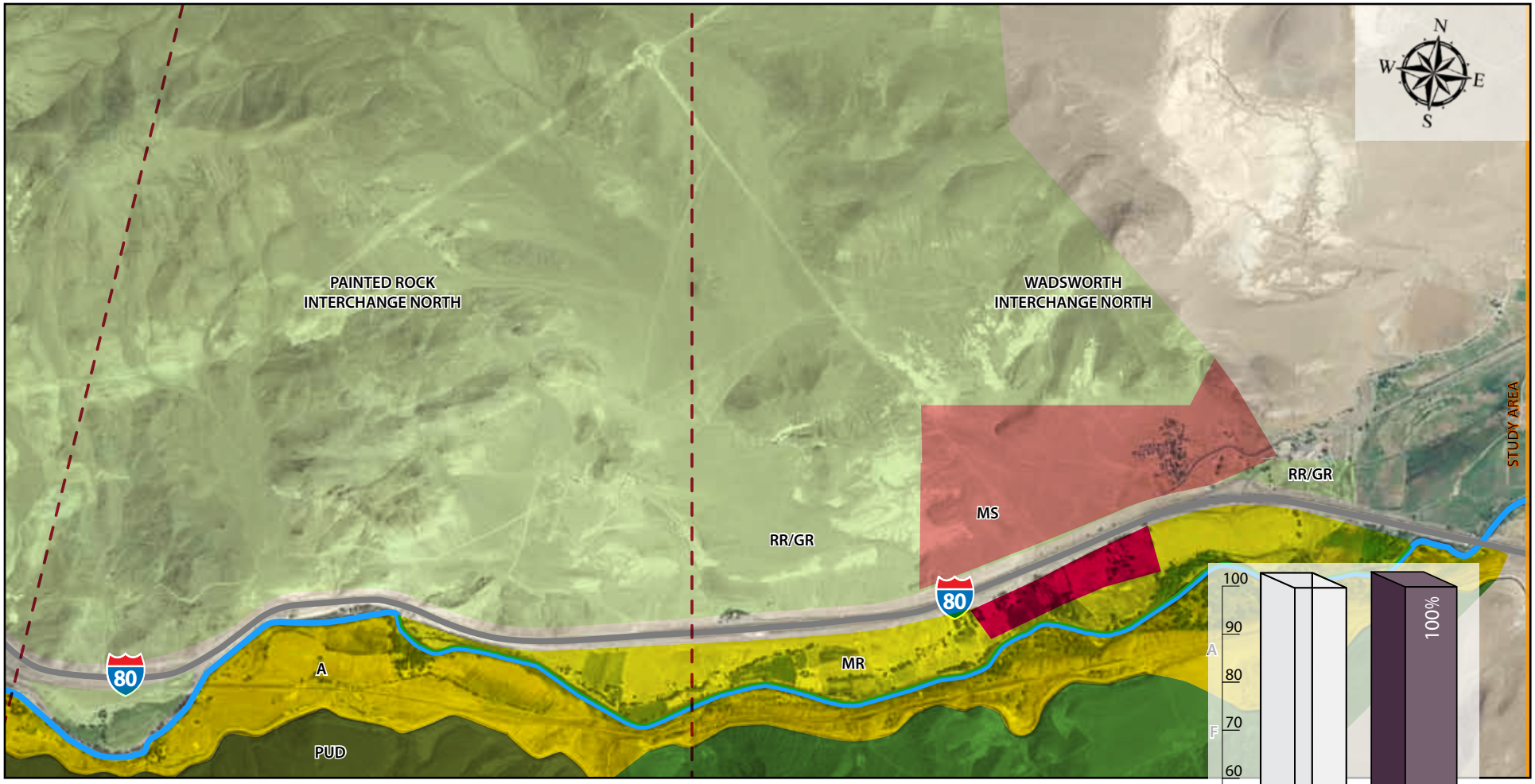
PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	◒
ENVIRONMENTAL*	⊖

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- Boundary Lines
- ROW Constraint
- Bikepath Constraint
- River Constraint
- Bridge Constraint
- Corridor Limits

* See page 45-49 for details.

19 - Painted Rock Interchange North, Wadsworth Interchange North



LEGEND: I-80 River Boundary Lines Corridor Limits

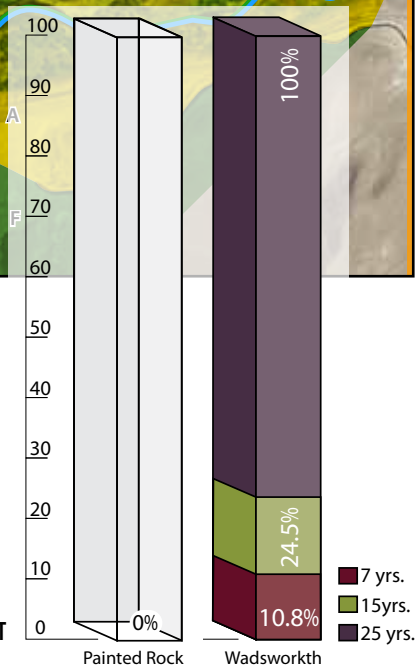
ECONOMIC VALUES - PAINTED ROCK

Market	◒
Attractiveness	◒
Employment	⊖
Developable Land	◒

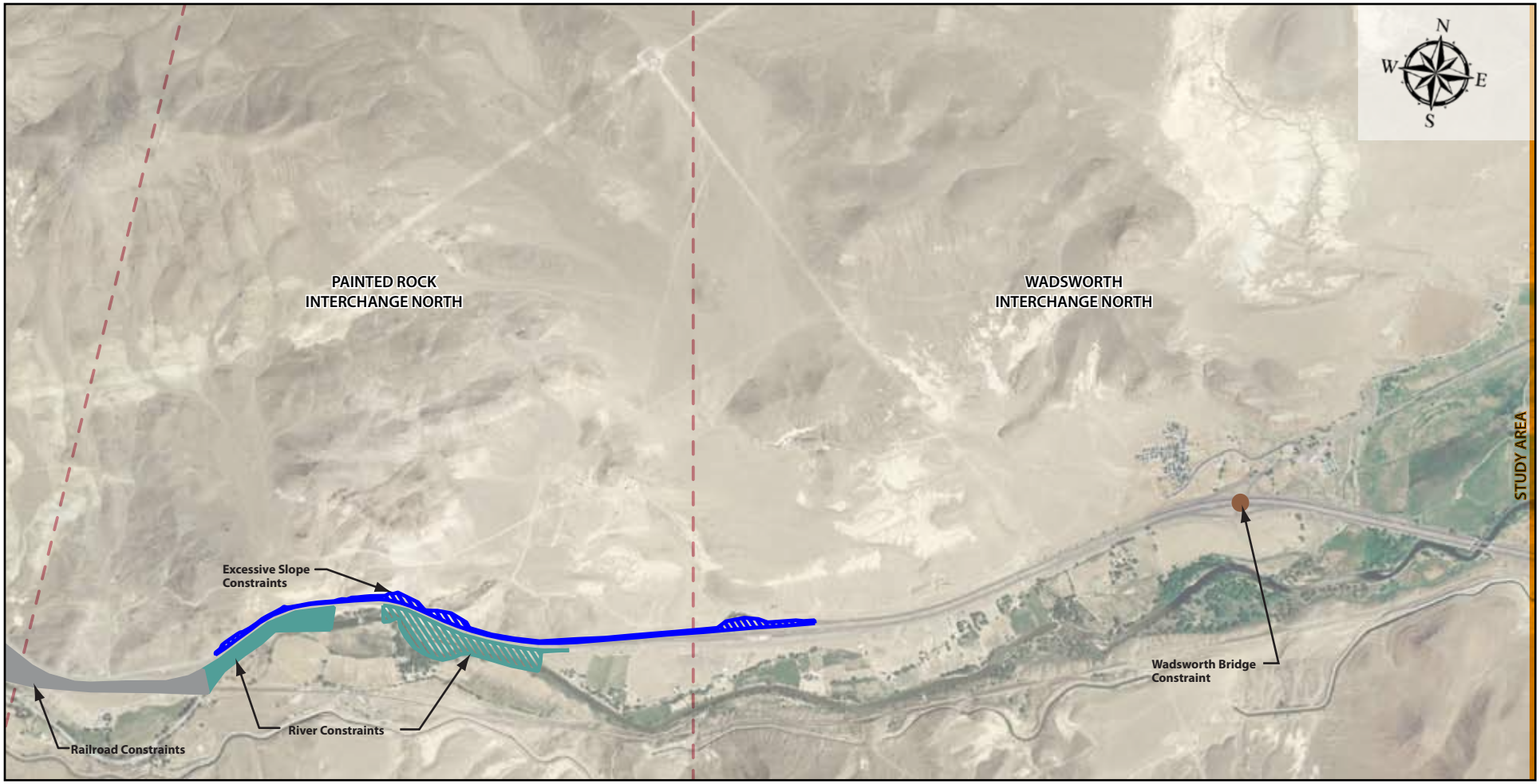
ECONOMIC VALUES - WADSWORTH

Market	◒
Attractiveness	◒
Employment	⊖
Developable Land	◒

REALIZED DEVELOPMENT



19 - Painted Rock Interchange North, Wadsworth Interchange North



CONSTRAINTS AND IMPACT RATINGS - PAINTED ROCK

PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	N/A
ENVIRONMENTAL*	○

CONSTRAINTS AND IMPACT RATINGS - WADSWORTH

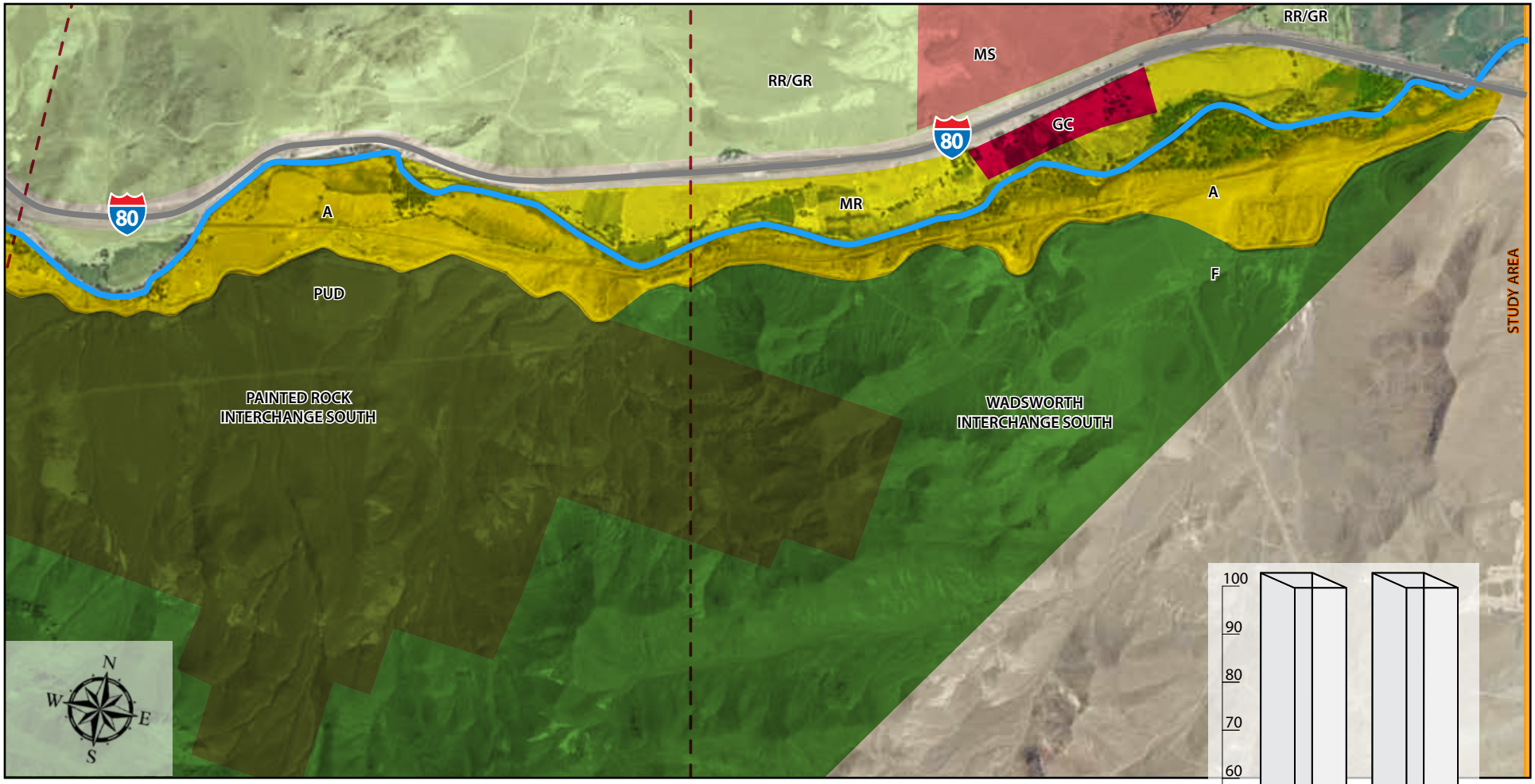
PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	N/A
Bridge Constraint	◒
ENVIRONMENTAL*	○

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- Boundary Lines
- ROW Constraint
- Bikepath Constraint
- River Constraint
- Bridge Constraint
- Corridor Limits

* See page 45-49 for details.

20 - Painted Rock Interchange South, Wadsworth Interchange South



LEGEND: I-80 River Boundary Lines Corridor Limits

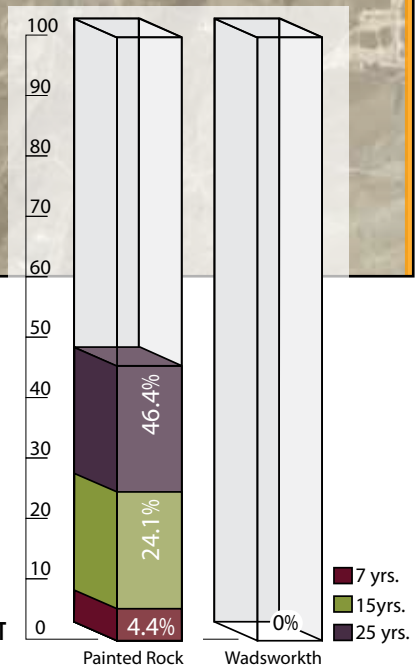
ECONOMIC VALUES - PAINTED ROCK

Market	◒
Attractiveness	◒
Employment	⊖
Developable Land	◒

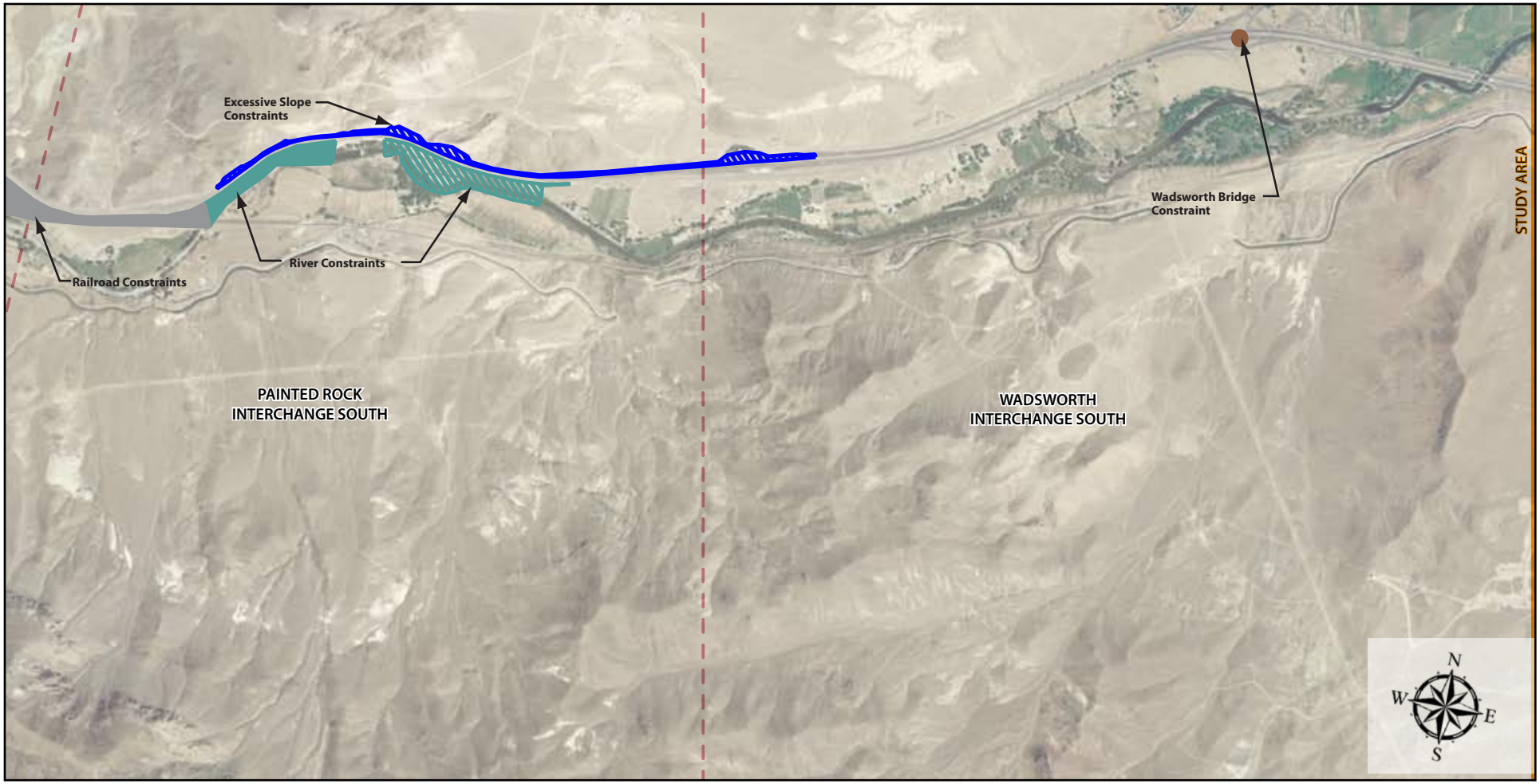
ECONOMIC VALUES - WADSWORTH

Market	◒
Attractiveness	◒
Employment	⊖
Developable Land	◒

REALIZED DEVELOPMENT



20 - Painted Rock Interchange South, Wadsworth Interchange South



CONSTRAINTS AND IMPACT RATINGS - PAINTED ROCK

PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	●
River Constraint	●
Bridge Constraint	N/A
ENVIRONMENTAL*	◒

CONSTRAINTS AND IMPACT RATINGS - WADSWORTH

PHYSICAL	
Slope, Rock & Embankment	◒
Frontage Road Constraint	N/A
ROW Constraint	N/A
Bike Path Constraint	N/A
Culvert & Pipe Constraint	N/A
Railroad Constraint	N/A
River Constraint	N/A
Bridge Constraint	◒
ENVIRONMENTAL*	◒

LEGEND:

- Slope, Rock & Embankment Constraints
- Frontage Road Constraint
- Culvert & Pipe Constraints
- Railroad Constraint
- Boundary Lines
- ROW Constraint
- Bikepath Constraint
- River Constraint
- Bridge Constraint
- Corridor Limits

* See page 45-49 for details.

NICHOLS CONSULTING ENGINEERS, Chtd.
Engineering and Environmental Services

P.O. Box 1760 • Zephyr Cove, NV 89448 • 775.588.2505 • FAX 775.588.2607

ENVIRONMENTAL CONSTRAINT RANKING MEMORANDUM

For the:
NEVADA DEPARTMENT OF TRANSPORTATION
I-80 CORRIDOR STUDY

Prepared For:
Nevada Department of Transportation
1263 South Stewart Street
Carson City, Nevada 89712

Prepared by:
Nichols Consulting Engineers, Chtd.
Engineering & Environmental Services
P.O. Box 1760
Zephyr Cove, NV 89448

PURPOSE

To facilitate transportation planning in the I-80 Corridor between West Verdi and Fernley, and identify areas that could potentially encounter the highest level of environmental constraints due to corridor improvements, a ranking scheme has been developed and applied to resources of concern within the study area. These resources were initially identified in the Nevada Department of Transportation (NDOT) I-80 Corridor Study, Draft Environmental Resources Technical Memo prepared by Nichols Consulting Engineers in February 2008. This memo explains the process and assumptions used to rank environmental constraints and impacts.

ASSUMPTIONS

Vegetation, fisheries and wildlife, water, air, cultural, scenic and recreational resources were examined in this analysis. Research conducted for the Environmental Resources Technical Memo did not yield any Superfund, National Priority Listed (NPL), or Brownfield hazardous waste sites. As a result, this resource was not included in this analysis. It should be noted that underground leaking tanks are present throughout the project area, but these sites were not a part of this investigation, and will need to be examined when NDOT completes a Phase 1 Environmental Investigation for hazardous and contaminated sites. In addition, geological resources were not included in this evaluation because no general growth restraints were found to exist in the project study area based on the level of analysis completed for the Environmental Technical Memo. Again, site-specific investigations will need to be completed on a project level in order to adequately assess the potential implications of geologic resources.

This analysis also assumes that the environmental setting within each interchange area is constant; it does not account for a project's proximity to the Truckee River. A close proximity to the Truckee River or other major water sources such as wetlands, springs, and confluences will increase the environmental constraint and impact due to development. This can be applied to all resources but is especially significant when examining wetlands and floodplains, fisheries, and cultural resources. NDOT will need to need to consider a project's distance to the Truckee River when assessing environmental constraints and impacts.

PROCEDURE

Resources for each interchange area were ranked based on a qualitative comparison to each other. To

quantify the importance of each resource for this scale of study, a point system was developed. Environmental constraint and impact rankings considered the regulatory, financial, and time investment unique to each resource and its associated mitigation. Such considerations were quantified based on three categories: compliance, effort, and mitigation. These are defined below:

Compliance

To account for the difference in regulatory demands between resources, a **compliance score** was applied. This score is based on the amount of regulation, plans, permits, and level of protection in place for this resource.

Effort

To account for the variation in time and costs required to evaluate impacts, conducts studies, and report analysis, an **effort score** was applied.

Mitigation

To account for the range in mitigation measures, a **mitigation score** was applied. This score is based on the scale, complexity, and the potential area of impact to the resource in question.

The scoring matrix shown in Table 1 defines how compliance, effort, and mitigation scores were determined. The sum of these scores is referred to as the **resource index**. To relate resource significance to density at each interchange area, a **weighted value** was calculated by multiplying the resource index by the rate of occurrence. This weighted comparison accounts for areas that contain many occurrences of low-scoring resources. An example of this process is as follows:

Nevada Department of Wildlife (NDOW) game mammals (big horn, mule deer, and pronghorn) have relatively few compliance measures, mitigation, and time/costs investments when compared to the federally endangered Cui-ui. For this reason, NDOW game mammals received a score of one each for compliance, effort, and mitigation. The resource index for game mammals is three (1+1+1). By itself, this score is not a significant value, but if there are several occurrences in one area, then the weighted value is increased. At the North Patrick Interchange, for instance, there are three game mammal habitat areas. This would make the weighted value equal nine (3 x 3), which accounts for density, as well as significance.

Table 1. Resource Scoring Matrix

Level	Compliance	Effort	Mitigation
3	Substantial regulation exists for this resource.	Time and costs are expected to be high.	Mitigation measures are substantial.
2	Moderate levels of regulation exist for this resource.	Time and costs are expected to be moderate.	Mitigation measures are moderate.
1	Little to no regulation exists for this resource.	Time and costs are expected to be low.	Mitigation measures are low.

To assess the environmental constraint and impact ranking at each interchange area, the calculated totals were compared to each other using the ranking scale shown in Table 2.

Table 2. Environmental Constraint and Impact Ranking Scale

Level	Range (32-172)	Description
High	100-172 points	Indicates that the environmental impact or the cost of the physical constrains is extremely high and cause corridor improvements to become prohibitive.
Medium High	85-99 points	Indicates that the environmental impact or the cost of physical constraints is significant in implementing corridor improvements. Mitigation measures can be cost prohibitive.
Medium Low	52-84 points	Indicates that the environmental impact or the cost of physical constraints is of secondary importance to the need for corridor improvements. Mitigation measures are acceptable.
Low	32-51 points	Indicates that the environmental impact or the cost of physical constraints is only remotely significant in implementing corridor improvements.

EXCEPTIONS

Based on the unique constraints of cultural and floodplain features, the following exceptions were made to calculate these ranking indices:

Cultural

Exact cultural site locations and descriptions are not legally allowed for public review, but generalizations can be made based on existing studies, proximity to water, and mapped culturally significant resources. General Land Office (GLO) maps attempt to define areas that would likely contain historic period cultural resources, and can be used to estimate sensitivity. The corridor was examined for evidence of a) agriculture and industry, b) communication, c) settlement, and d) transportation. One point is given for each cultural resources found in each area. The highest occurrence value possible for a given interchange is 4, indicating that evidence of agriculture and industry, communication, settlement, and transportation are all shown there.

Floodplain

Flood Insurance Rate Maps (FIRMs) were obtained and used to identify floodplains within the NDOT I-80 Corridor Study Area. A FIRM depicts the spatial extent of Special Flood Hazard Areas (SFHAs) and other thematic features related to flood risk assessment. SFHAs are areas subject to inundation by a flood having a one-percent or greater probability of being equaled or exceeded during any given year. Flood risk is defined as low, medium, and high as shown on the FIRM. Occurrence values used to asses the environmental constraint and impact ranking range from 1 (low flood risk) to 3 (high flood risk).

RESULTS

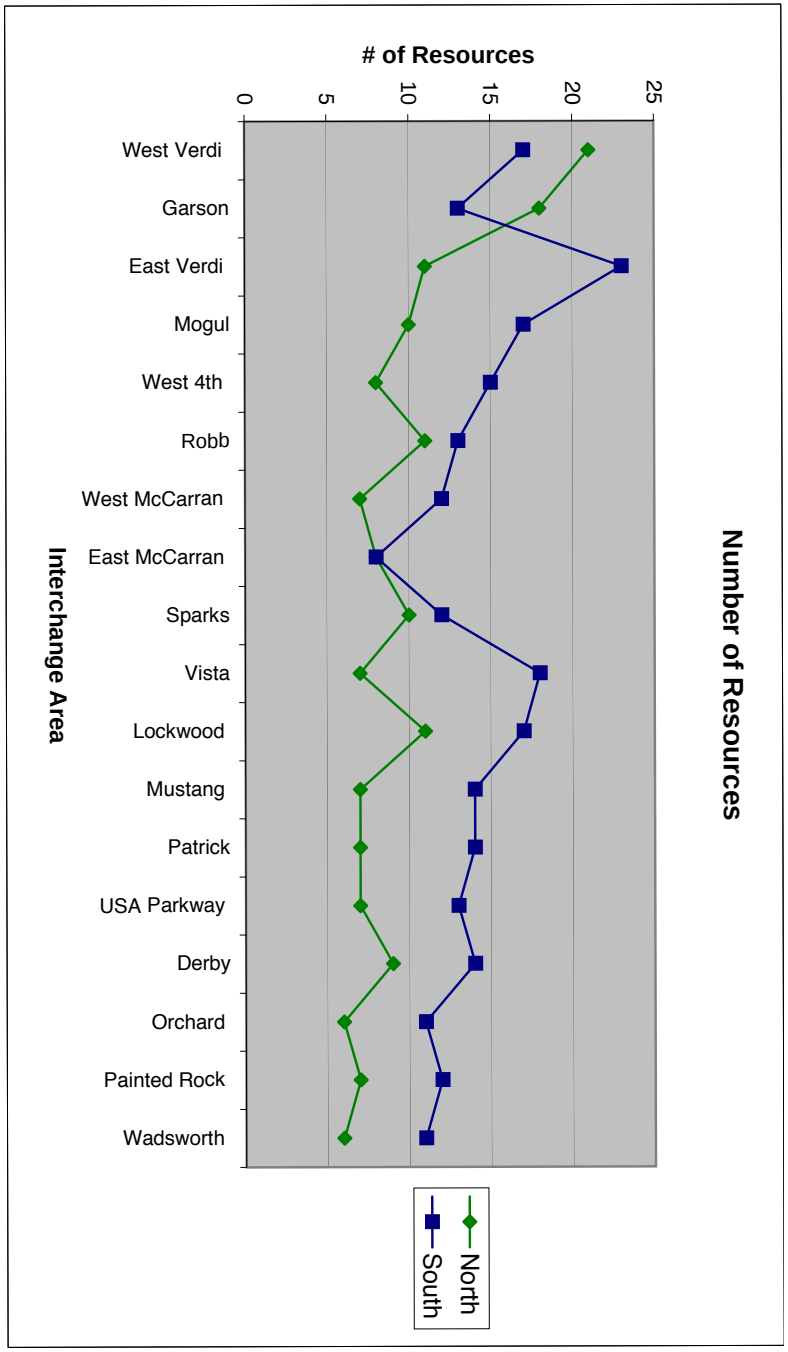
It was found that interchange areas located in the western portion of the I-80 corridor have resources with high environmental constraint and impact rankings. Rankings tend to be moderate east of Sparks. In general, the southern interchange areas have higher rankings than the northern areas. This in part due to the Truckee River which runs south of I-80 for most of corridor (crosses I-80 near the Garrison Interchange). Table 3 shows the environmental constraint and impact ranking for each interchange area.

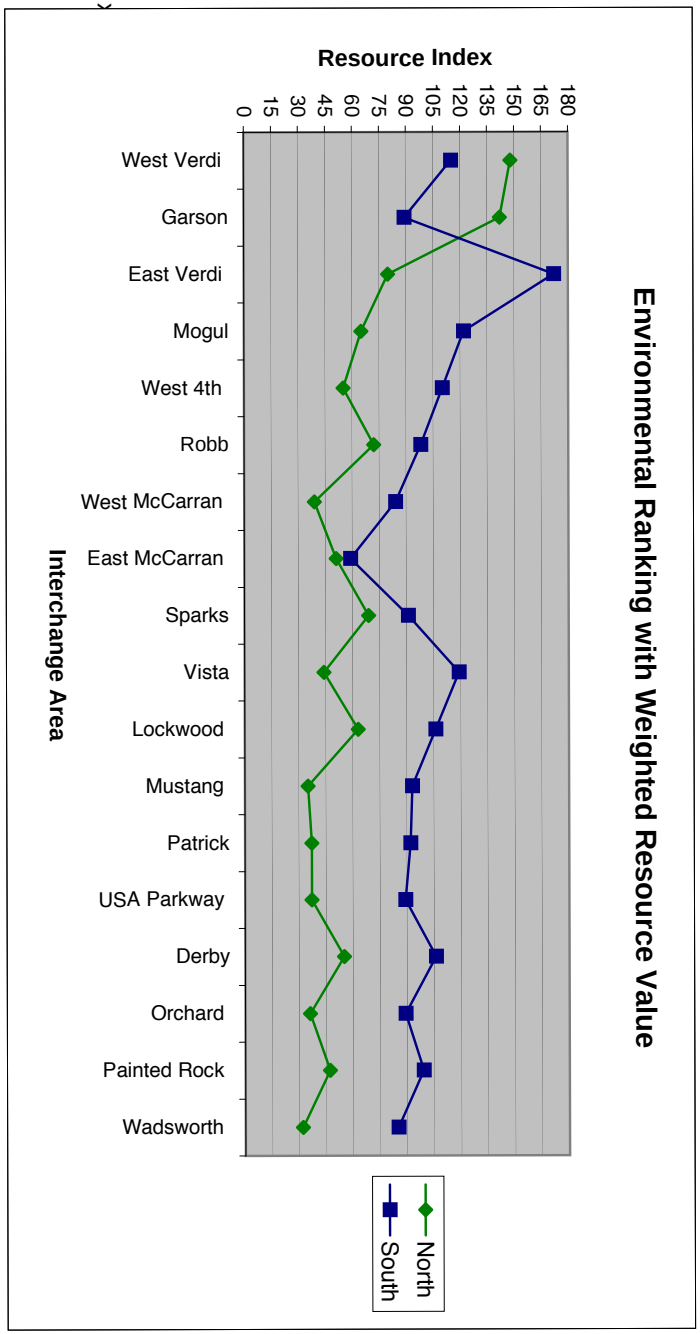
Table 3. Environmental Constraint and Impact Rankings for Each Interchange Area

	Environmental Constraint and Impact Ranking	
Interchange Area	**North**	**South**
West Verdi	High	High
Garson	High	Medium High
East Verdi	Medium Low	High
Mogul	Medium Low	High
West 4th	Medium Low	High
Robb	Medium Low	Medium Low
West McCarran	Low	Medium Low
East McCarran	Low	Medium Low
Sparks	Medium Low	Medium Low
Vista	Low	High
Lockwood	Medium Low	Medium High
Mustang	Low	Medium High
Patrick	Low	Medium High
USA Parkway	Low	Medium Low
Derby	Low	High
Orchard	Low	Medium Low
Painted Rock	Low	Medium High
Wadsworth	Low	Medium High

Environmental Constraint Ranking Memorandum: Resource Analysis

| | | | | | INTERCHANGE AREAS | | | | |


Number of Resources
# of Resources
25
20
15
10
5
0
West Verdi
Garson
East Verdi
Mogul
West 4th
Robb
West McCarran
East McCarran
Sparks
Vista
Lockwood
Mustang
Patrick
USA Parkway
Derby
Orchard
Painted Rock
Wadsworth
Interchange Area
North
South


Environmental Ranking with Weighted Resource Value
Resource Index
180
165
150
135
120
105
90
75
60
45
30
15
0
West Verdi
Garson
East Verdi
Mogul
West 4th
Robb
West McCarran
East McCarran
Sparks
Vista
Lockwood
Mustang
Patrick
USA Parkway
Derby
Orchard
Painted Rock
Wadsworth
Interchange Area
North
South

PROVIDED ELECTRONICALLY ON ENCLOSED CD

APPENDIX 4-B

APPENDIX 4-C

Table 1. Summary of Workshop Results

Influence Area	RTC's Forecast			7 Year Estimate				15 Year Estimate				25 Year Estimate			
	Buid Out AADT	2005 AADT	Remaining AADT	% Average Realized Development	Likelihood of Occurrence			% Average Realized Development	Likelihood of Occurrence			% Average Realized Development	Likelihood of Occurrence		
					Average	Lower	Higher		Average	Lower	Higher		Average	Lower	Higher
West Verdi North	23,300	2,500	20,800	22.2	57%	30%	13%	40.4	69%	23%	8%	100			
West Verdi South				17.9	75%	7%	18%	39.2	50%	12%	38%	64	60%	20%	20%
Verdi North	18,900	1,900	17,000	22.2	57%	30%	13%	40.4	69%	23%	8%	100			
Verdi South				17.9	75%	7%	18%	39.2	50%	12%	38%	64	60%	20%	20%
Garson North	44,300	9,500	34,800	23.7	70%	22%	7%	49.2	58%	15%	27%	72.9	71%	14%	14%
Garson South				13.7	67%	22%	11%	47.3	50%	23%	27%	73.3	62%	19%	19%
East Verdi North	13,200	4,100	9,100	46.1	75%	11%	14%	70.8	50%	33%	17%	100			
East Verdi South				27.9	54%	14%	32%	87.6	52%	16%	32%	88.3	67%	11%	22%
Mogul North	3,300	4,000	-700	37.0	78%	7%	15%	76.4	28%	28%	44%	100.0			
Mogul South				25.2	74%	11%	15%	66.4	44%	24%	32%	100.0			
West 4th Street North	13,500	2,900	10,600	46.9	62%	12%	27%	74.0	32%	32%	36%	100.0			
West 4th Street South				24.8	70%	15%	15%	51.3	48%	30%	22%	100.0			
Robb North	32,200	17,300	14,900	45.0	71%	21%	7%	74.0	48%	24%	28%	100.0			
Robb South				25.0	69%	15%	15%	60.0	63%	4%	33%	100.0			
West McCarran North	31,700	33,400	-1,700	49.6	67%	7%	26%	76.7	71%	8%	21%	100.0			
West McCarran South				45.4	54%	19%	27%	76.7	75%	4%	21%	100.0			
East McCarran North	63,100	27,900	35,200	45.0	75%	11%	14%	70.0	63%	33%	4%	86.8	86%	0%	14%
East McCarran South				36.2	62%	15%	23%	69.6	71%	0%	29%	100.0			
Sparks North	40,900	19,100	21,800	45.0	75%	11%	14%	70.5	73%	23%	5%	88.3	91%	0%	9%
Sparks South				22.9	79%	14%	7%	63.5	65%	22%	13%	100.0			
Vista North	97,100	23,800	73,300	15.0	58%	21%	21%	45.2	78%	9%	13%	67.8	70%	9%	22%
Vista South				14.6	75%	13%	13%	38.8	67%	4%	29%	70.0	68%	5%	27%
Lockwood North	51,200	300	50,900	29.6	61%	11%	29%	100.0				100.0			
Lockwood South				12.9	79%	14%	7%	73.8	71%	21%	8%	100.0			
Mustang North[1]	64,900	1,100	63,800	11.1	68%	25%	7%	74.6	63%	21%	17%	100.0			
Mustang South[1]				16.1	75%	11%	14%	63.5	65%	22%	13%	100.0			
Patrick North[2*]	82,990	2,200	80,790	8.9	86%	0%	14%	42.3	68%	23%	9%	62.3	55%	27%	18%
Patrick South[2*]				32.3	58%	31%	12%	65.0	82%	9%	9%	81.3	52%	30%	17%
USA Parkway North[3*]	74,150	4,600	69,550	17.6	60%	12%	28%	46.4	64%	14%	23%	68.7	65%	9%	26%
USA Parkway South[3*]				13.8	77%	12%	12%	42.3	77%	18%	5%	65.7	65%	17%	17%
Derby North	42000	29,000	13,000	0.8	100%	0%	0%	100.0				100.0			
Derby South				1.2	100%	0%	0%	41.9	81%	19%	0%	61.8	64%	23%	14%
Orchard North	42000	29,200	12,800	0.4	100%	0%	0%	100.0				100.0			
Orchard South				8.9	81%	0%	19%	33.2	73%	18%	9%	53.0	70%	22%	9%
Painted Rock North	55000	38,000	17,000	0.7	100%	0%	0%	100.0				100.0			
Painted Rock South				4.4	96%	0%	4%	21.8	68%	23%	9%	46.4	64%	23%	14%
Wadsworth North	173000	119,200	53,800	10.8	69%	23%	8%	24.1	86%	9%	5%	100			
Wadsworth South				7.6	84%	0%	16%	24.5	75%	15%	10%	100			

(*) Future volume adjusted to reflect additonal information regarding growth in the area

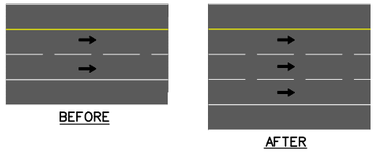
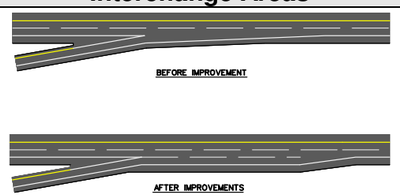
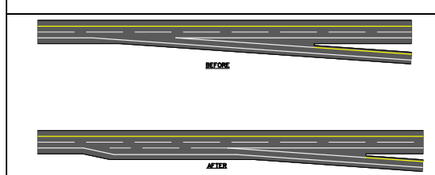
1. The demand at this interchange includes also the demand of the future Spanish Springs Connector

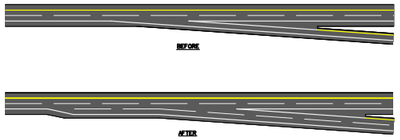
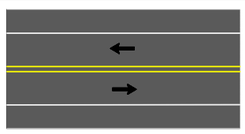
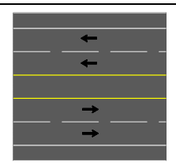
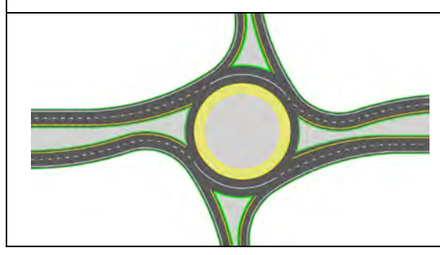
2. The demand at this interchange includes 20% of the demand of the future Tracy Clark Interchange

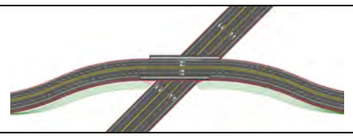
3. The demand at this interchange includes 80% of the demand of the future Tracy Clark Interchange

MINDEN
GARDNERVILLE
LAMPSON
LAMPSON

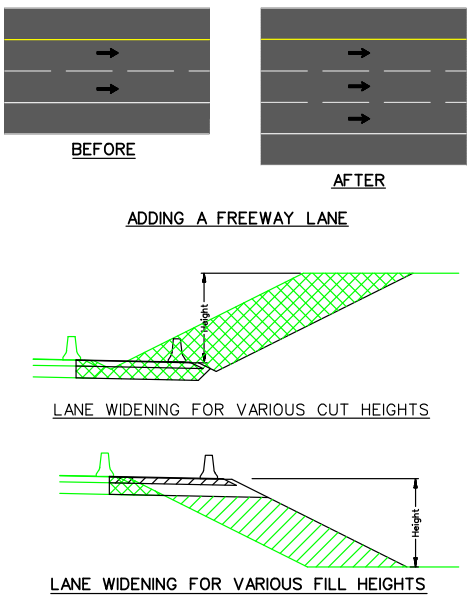
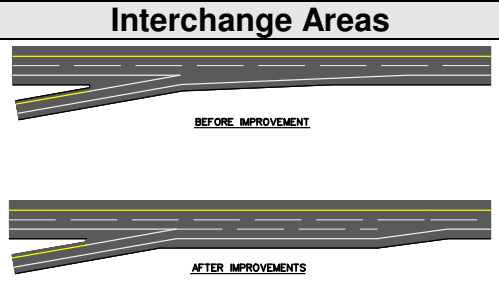
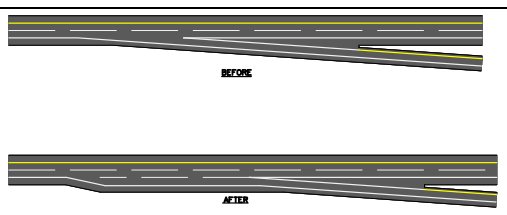
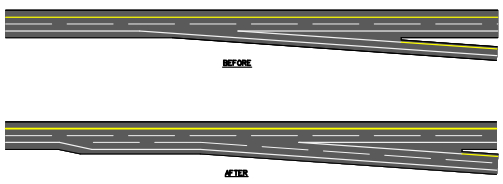
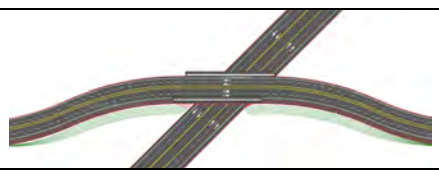
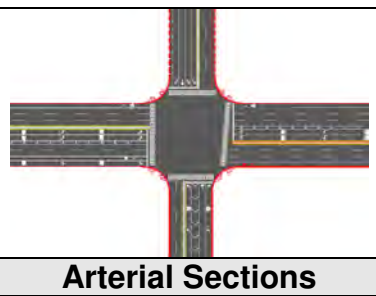
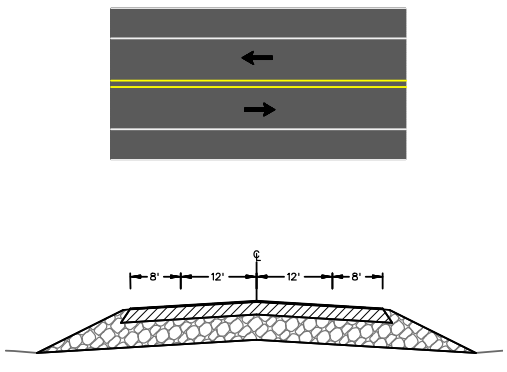
I80 Corridor Study Improvement Triggers and Indicators Matrix

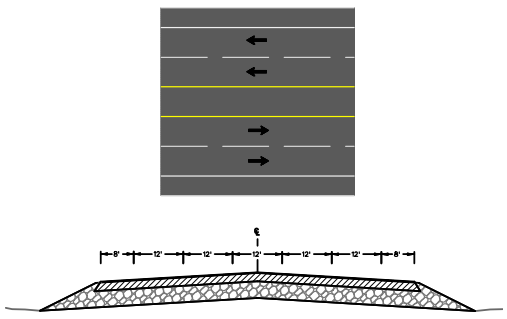
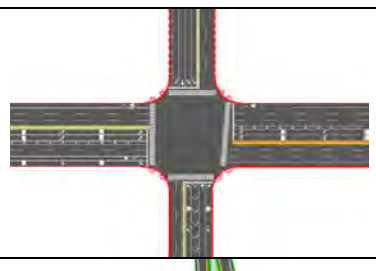
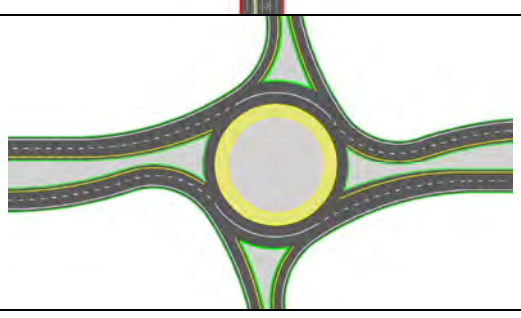
Improvement / Treatment		Improvement Triggers and Indicators		
		Trigger	Indicator	Remarks
Basic Freeway Sections				
	Freeway Lane Addition	▪ Mainline speed reduction due to high demand ▪ Freeway bottlenecks due to insufficient capacity	LOS D density between 26–35 pc/mi/ln *Freeway density as calculated by HCM Chapter 23 methodology*	Used to comply with capacity needs. Recommended minimum length of freeway lane addition is 2 miles. Existing freeway density should be calculated from speed loops.
	Auxilliary Lane Addition	▪ Mainline speed reduction due to high number of speed change maneuvers and weaving of traffic entering and leaving the freeway. ▪ High Accident Rate	LOS D density between 28-35 pc/mi/ln *Freeway density as calculated by HCM Chapters 23 and 24 methodology*	Used to satisfy lane balance or capacity needs. Depending on need, auxiliary lane(s) can be extended to adjacent ramp or dropped 2,500 feet downstream or developed 1,500 feet upstream of ramp gore. Freeway density calculated from speed loops.
Interchange Areas				
	Freeway Acceleration Lane For Taper and Parallel Design	▪ Mainline speed reduction ▪ High Accident Rate	LOS D density between 28-35 pc/mi/ln *Merge density as calculated by HCM Chapter 25 methodology*	Operational and safety benefits of long acceleration lanes provided by parallel type entrances are well recognized. Parallel acceleration lanes are desirable when anticipated freeway and ramp volumes approach the design capacity of the merge area. Outside freeway lane density calculated from speed loops.
	Freeway Deceleration Lane for Taper and Parallel Design	▪ Mainline speed reduction and queuing ▪ High Accident Rate	LOS D density between 28-35 pc/mi/ln *Diverge density as calculated by HCM Chapter 25 methodology*	In locations where both mainline and ramp carry high volumes of traffic, the deceleration lane provided by the parallel type exit provides storage for vehicles that would reduce speed causing queuing. Outside freeway lane density calculated from speed loops.

		Improvement Triggers and Indicators		
	Freeway Ramp Widening	▪ High delay on the ramp terminal due to insufficient capacity of the off-ramp. ▪ Speed reduction and queuing on the freeway due to insufficient capacity of the off-ramp ▪ High delays on the arterial due to insufficient capacity of freeway on-ramp.	Ramp Capacity Maximum capacity of single lane ramp roadway is 2,200 pc/h Maximum capacity of dual lane ramp roadway is 4,400 pc/h	Use to comply with capacity needs in freeway on and off ramps.
	Ramp Terminal Geometrical Modification	▪ High delays in the left and right turn movements.	Turning Volumes If left turn volumes exceed 300 vehicles per hour, dual lefts required. If right turn volumes exceed 150 vehicles per hour a separate right turn lane required.	Used to comply with capacity needs and to reduce storage requirements.
	Ramp Terminal Intersection Control Modificaiton	▪ High intersection delays due to insufficient capacity ▪ High accident rate	LOS D delay between 35-55 sec/veh *Intersection delay as calculated by HCM Chapters 16 and 17 methodology* MUTCD 4C.04 Warrant 3 – Peak Hour Volume met	Intersection control is often combined with geometrical control to comply with capacity needs.
	Two Lane Arterial	▪ Demand for travel	LOS D delay between 35-55 sec/veh Intersection delay as calculated by HCM Chapters 16 and 17 methodology	The capacity of the arterial is generally dictated by the capacity of its individual signalized intersections.
	Arterial Widening	▪ Speed reduction due to insufficient capacity.	LOS D delay between 35-55 sec/veh *Intersection delay as calculated by HCM Chapters 16 and 17 methodology*	The capacity of the arterial is generally dictated by the capacity of its individual signalized intersections. Used to comply with capacity needs.
	Replacing Stop Controlled Intersection with a Roundabout	▪ Delays due to insufficient intersection capacity. ▪ High accident rates	LOS D delay between 35-55 sec/veh Capacity of Circulating Flow Capacity of single lane roundabout = 1,800 circulating flow Capacity of dual lane roundabout = 3,400 circulating flow	Roundabouts are generally safer than other forms of at-grade intersections. Right-of-way costs may be higher for roundabout designs.

		Improvement Triggers and Indicators		
	New Interchange	▪ Development and demand for travel.	LOS D or higher at adjacent interchanges. Alternative routes are not feasible. *Operations in ramp gore areas and at ramp terminals as determined from HCM methodologies*	Used when modifications to the existing area's interchanges can't maintain LOS D.
	Grade Separation	▪ Development and demand to cross the freeway ▪ Access management		Used when interchange minimum spacing criteria can't be achieved, and existing area interchanges can be mitigated to LOS D.

I80 Corridor Study Associated Improvement Costs Matrix

Treatment		Description	Cost
Basic Freeway Sections			
	Freeway Lane Addition	Adding a Freeway Lane (Per 100ft) No Additional Earthwork Asphalt Concrete 10' Cut Height Asphalt Concrete 50' Cut Height Asphalt Concrete 100' Cut Height Asphalt Concrete 10' Fill Height Asphalt Concrete 30' Fill Height Asphalt Concrete 50' Fill Height Asphalt Concrete	 $23,400 $32,300 $41,800 $50,700 $103,900 $112,800 $181,500 $190,400 $34,800 $43,700 $63,000 $71,900 $91,200 $100,100
	Auxilliary Lane Addition		
Interchange Areas			
	Freeway Acceleration Lane For Taper Design vs. Parallel Design	Freeway Acceleration Lane No Additional Earthwork Asphalt Concrete 10' Cut Height Asphalt Concrete 10' Fill Height Asphalt Concrete	 $340,200 $461,300 $622,000 $743,100 $513,500 $634,700
	Freeway Deceleration Lane Modification for Taper Design vs. Parallel Design	Freeway Deceleration Lane No Additional Earthwork Asphalt Concrete 10' Cut Height Asphalt Concrete 10' Fill Height Asphalt Concrete	 $145,000 $193,500 $270,200 $318,700 $222,000 $270,500
	Freeway Ramp Widening	Widening a Freeway Ramp No Additional Earthwork-Asphalt 10' Cut Height-Asphalt 10' Fill height-Asphalt	 $755,100 $1,363,000 $1,129,100
	Freeway Interchange Modification	Bridges	$200 - $250 / SF
	Ramp Terminal Geometrical Modification	Intersection Improvement Adding a Turn Pocket	$73,700
	Ramp Terminal Intersection Control Modification	Replacing a Stop Controlled Intersection with a Signalized Intersection	$650,000
Arterial Sections			
	Two Lane Arterial	Two Lane Arterial (Per 100ft)	$53,100

Treatment		Description	Cost
	Arterial Widening	Four Lane Arterial (Per 100ft) Six Lane Arterial (Per 100ft)	$92,500 $
	Intersection Geometrical Improvements	Intersection Improvement Adding a Turn Pocket	$73,700
	Intersection Control Modification (not including roadway widening or intersection geometrical improvements)	Replacing a Stop Controlled Intersection with a Signalized Intersection	$650,000
	Roundabout	Replacing a Stop Controlled Intersection with a Roundabout	$1.5 million
		Bridges	$200 - $250 / SF
		Retaining Walls	$70 / SF
		Freeway Re-Striping (Per 100ft) Existing Three Lanes to Four Lanes	$2,700
	New Interchange	Adding a New Interchange	$13 million - $57 million

WASHOE CO
LYON CO
MINERAL CO
EMMONS
LAMPSON
WASHOE
LAKE
MINERAL
EMMONS
LAMPSON
EMMONS
LAMPSON
EMMONS
LAMPSON

MEMORANDUM

TO:	Emily Kubovchik, Perry Gross
PREPARED BY:	Danja Petro
DATE:	February 17, 2009

The purpose of this memo is to summarize the methodology for estimating the 2040 AADT along USA Parkway and the assumptions made for developing a low, medium and high estimate for the traffic that will be generated by USA Parkway.

USA Parkway is a new proposed arterial that will connect US 50 at Ramsey-Weeks cutoff with the existing USA Parkway Interchange in I-80. To date seven miles of approximately seventeen miles of USA Parkway have been graded by the developers and approximately four miles of the road have been paved with utilities. The biggest developments currently anticipated to occur along USA Parkway include Tahoe-Reno Industrial Center (TRIC), which is located south if I-80 USA Parkway interchange, and Highlands Development which is located within Lyon County between TRIC and US 50.

Information provided by Storey County indicates that TRIC has currently sold 2100 acres and about 70% or 1470 acres has been currently developed. The developed area consists of 8,538,384 square feet of buildings and the total number of employees in the industrial center is 3,240 or 1.54 employees per acre. Projected total acreage in the industrial area is 8,900 acres and the projected total employment is 13,350. The industrial area will be build in the areas located west and east of USA Parkway. For the purpose of this analysis the area on the west is considered Area 1 and the area on the east is Area 2.

Highlands Development is a proposed development along USA Parkway in Lyon County that includes approximately 20,250 acres with an existing zoning RR-5. This zoning allows 20 acres parcels minimum which accommodates 1012 residential units. The developer is in the process of proposing a development much larger in size that will include up to 29,000 dwelling units. However, if the development of this size will ever be build, the impacts need to be evaluated by separate studies due to the regional significance of the development.

The USA Parkway future traffic projections were performed using a simplified version of a four step travel demand model. This model assumed that two major industrial areas will be developed in the northern section of USA Partway with a total 8900 acres and a major mixed residential area (Highlands Development) located within Lyon County with a total of 20250 acres.

The first step of the model is the Trip Generation that calculates the total number of trips generated from each area. The trip generation rates employed in this analysis were obtained from the Institute of Transportation Engineers *Trip Generation*, *Seventh Edition*. These generation rates were used to estimate the number of trips made to and from each site during the day and at peak AM and PM hours. The following land uses were used for each specific area.

1. Industrial area: ITE-120, General Heavy Industrial land use that calculates the number of trips based on the number of acres.
2. Residential Area: ITE-210, Single Family Detached Housing that calculates the number of trips based on the number of acres

Nevada Department of Transportation provided 2008 traffic count information on USA parkway. Based on this information the AADT generated by TRIC in 2008 is 6800vpd.

Storey County Planning Department provided information regarding the total number of employees currently working at TRIC and the total number of acres build out to date.

When compared to the existing counts along USA Parkway the ITE trip generation rate for General heavy Industrial overestimates the number of trips generated, therefore a calibration coefficient was included in the calculations that adjust the trip generation rates for acres of development to reflect the existing conditions. The calculated calibration coefficient is 0.6853.

The second step in the trip estimation model is the trip distribution. The distribution of trips was based on the population of major population areas that surround TRIC and their distance. The population data was obtained from American Survey 2005. The areas included in the trip distribution include Reno-Sparks urban area, Fernley, Fallon, Dayton, Carson City, Yerington, Silver Springs and Stagecoach. Using the 2000 Census figure of 2.63 person per household, the population estimated in the Highlands residential area will be 2661.

The estimated growth rate for each of these areas is included in the summary sheet of the travel forecasting workbook. The trip distribution takes into consideration only the trips generated or attracted by three major areas along USA Parkway. Due to lack of information and considering that the trip estimation is performed to identify the number of trips between the industrial area and USA Parkway Interchange, the number of trips between urban areas was not included in the analysis. Depending on the number of trips that would be generated by the Highland Development and attracted by TRIC the trip distribution table has

the flexibility of redistributing the number of trips. This feature provides us with the opportunity of performing a sensitivity analysis based on the scale of the residential development and the most likely attraction rate of TRIC.

The trip distribution was aggregated for each area and each segment of USA parkway. One shortfall of the trip distribution is the lack of flexibility to calculate the distribution of trips under existing conditions when USA Parkway and Highlands Development are inexistent. The purpose of this trip estimation is to calculate the most likely number of trips under the build-out conditions; therefore this lack of flexibility does not affect the ultimate goal of the trip estimation.

The mode split was calculated on the third step of trip estimation. ITE trip generation rates provide trip estimates in vehicles per hour therefore a vehicle occupancy rate of 1.2 was used to convert the vehicle trips in person trips. The mode split estimation was not performed using a 3% share for transit.

The fourth and the last step of the trip estimation model assigns the projected number of peak hour trips to different segments of USA Parkway based on the trip distribution table. The total number of peak hour trips is then converted to AADT using a k factor and a distribution factor obtained from ITE trip generation tables and weighted by type of development(industrial vs. residential).

Information obtained from Storey County Planning Department indicates that the projected total acreage for TRIC will be 8900 acres and the projected total employment is anticipated 13350.

While TRIC projections were based on the amount of land available for sale and on the current development and employment data, the information for Highlands Development is less certain. There is no information available regarding what type of development Highlands will be and what percentage of work trips will be linked to TRIC. However for the purpose of this analysis the number of dwelling units calculated based on the existing zoning was taken into consideration.

The existing traffic counts indicate that the traffic generated along USA Parkway will be distributed to I-80 through USA Parkway Interchange and Patrick Interchange. A distribution share of 75% to 25% was assumed will occur in the future with a directional distribution of 75% on the West and 25% on the East

The following is a summary table of the estimated trips for each scenario and their distribution to USA Parkway and Patrick Interchange

USA PARKWAY TRAVEL FORECASTING

1. BACKGROUND DATA

The forecasting process assumes that 3 major major areas will be developed along the future USA Parkway. The assumptions regarding the land use and the acreage in these areas is summarized in the following table:

	Area 1	Area 2	Area 3	
Acre	6000	2900	20250	
Land Use	Heavy Industrial*	Heavy Industrial*	Mixed Residential	
			Single Family	*Multi Family*

Area 1	TRIC West of USA
Area 2	Tric East of USA
Area 3	Highlands development

2. VARIABLES

Community	% Developed Area	Usage	Growth Rate	% Transit Share	% Share of Employment at TRIC	
Area 1	68.53%					
Area 2	68.53%					
Area 3	100.00%			3.00%	0%	Highest 10%
Single Family		100.00%				
Multi-Family		0.00%				
Reno - Sparks			0.99	3.00%		calculated from TDM
Fernley			1.42	3.00%		3% a year for 30 years (from 2005)
Fallon			1.42	3.00%		3% a year for 30 years (from 2005)
Dayton			1.42	3.00%		3% a year for 30 years (from 2005)
Carson City			1.42	3.00%		3% a year for 30 years (from 2005)
Yerington			1.42	3.00%		3% a year for 30 years (from 2005)
Silver Springs			1.42	3.00%		3% a year for 30 years (from 2005)
Sagecoach			1.42	3.00%		3% a year for 30 years (from 2005)

Vehicle Occupancy (passenger/vehicle)	1.2	
Buss Occupancy (passenger/bus)	40	
Residential Area K-Factor	10.50%	(Generated from Trip Generation)
Residential D	37%	(Generated from Trip Generation)
Industrial Area K - Factor	32%	(Generated from Trip Generation)
D	50%	(Generated from Trip Generation)

3. TRAVEL FORECASTING PROCESS

STEP 1 : TRIP GENERATION

Traffic Volume\Location	Area 1		Area 2		Area3			
					Single Family		Multi Family	
Daily Volume (veh/hour)	27755		13415		9690		0	
	Area 1 and Area 2				Area3			
	AM		PM		AM		PM	
Peak Hour Volume (person/hour)	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
	4885	4884	5329	5328	2362	2360	2576	2575
	9769		10657		4722		5152	

STEP 2: TRIP DISTRIBUTION

USA PARKWAY		% Traffic Area 1	% Traffic Area 2	% Traffic Area 3
Link 1	Stage Coach to Area 3	10.74%	20.44%	43.25%
Link 2	Area 3 to Area 2	10.74%	20.44%	56.75%
Link 3	Area 2 to Area 1	10.74%	79.56%	56.75%
Link 4	Area 1 to Tracey Clark Interchange	89.26%	79.56%	56.75%

STEP 3: MODE SPLIT

USA PARKWAY		% Traffic Area 1	% Traffic Area 2	% Traffic Area 3
Link 1	Stage Coach to Area 3	0.32%	0.61%	1.30%
Link 2	Area 3 to Area 2	0.32%	0.61%	1.70%
Link 3	Area 2 to Area 1	0.32%	0.61%	1.70%
Link 4	Area 1 to Tracey Clark Interchange	2.68%	2.39%	1.70%

STEP 4: TRIP ASSIGNMENT

USA PARKWAY		Total				AADT
		AM		PM		
		NB	SB	NB	SB	
Link 1	Stage Coach to Area 3	895	1054	1160	1048	9,652
Link 2	Area 3 to Area 2	1129	919	1098	1244	14,688
Link 3	Area 2 to Area 1	2291	2083	2366	2513	22,621
Link 4	Area 1 to Tracey Clark Interchange	5360	5153	5714	5862	43,553

STEP 1 : TRIP GENERATION

	Area 1				Area 2					Area 3		
Acre	6000				2900				20250			
Land Use	**Heavy Industrial***				**Heavy Industrial***				**Mixed Residential**			
									Single Family		***Multi Family***	
Developed area	69%				69%				100%			
									100%		0%	
Area in Acres	4111.8				1987.37				20250		0	
d.u/Acre	N/A				N/A				0.05		15	
Dwelling Units									1013		0	
Daily Volume	27755				13415				9690		0	
Peak Hour Volume pveh/hour	AM		PM		AM		PM		AM		PM	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
	4071	**4070**	**4441**	**4440**	**1968**	**1967**	**2147**	**2146**	**190**	**569**	**644**	**379**
Peak Hour Volume person/hour	AM		PM		AM		PM		AM		PM	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
	4885	**4884**	**5329**	**5328**	**2362**	**2360**	**2576**	**2575**	**228**	**683**	**773**	**455**

* ITE Land Use No.120 - Heavy industrial facilities usually have a high number of employees per indusrial plant and could also be categorized as manufacturing facilities (Land Use 140). The distinction between heavy industrial and manufacturing is vague. However heavy industrial uses are limited to the manufacturing of large items. General Light Industrial (Land Use 110), Industrial Park (Land Use 130) amd Manufacturing (Land Use 140) are related uses.

Gen Heavy Ind

Summary of Average Vehicle Trip Generation

For 4111.8 acres

June 4, 2006

Driveway Volumes	24-Hour Two-Way Volume	7-9 AM Peak Hour		4-6 PM Peak Hour	
		Enter	Exit	Enter	Exit
Average Weekday	27755	4071	4070	4441	4440

	24-Hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	0	0	0
Sunday	0	0	0

Note: A zero rate indicates no rate data available

Source: Institute of Transportation Engineers Trip Generation, 7th Edition.

Gen Heavy Ind

Summary of Average Vehicle Trip Generation

For 1987.4 acres

June 4, 2006

Driveway Volumes	24-Hour Two-Way Volume	7-9 AM Peak Hour		4-6 PM Peak Hour	
		Enter	Exit	Enter	Exit
Average Weekday	13415	1968	1967	2147	2146

	24-Hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	0	0	0
Sunday	0	0	0

Note: A zero rate indicates no rate data available

Source: Institute of Transportation Engineers Trip Generation, 7th Edition.

Single Family

Summary of Average Vehicle Trip Generation

For 1012.5 dwelling units

April 1, 2008

Driveway Volumes	24-Hour Two-Way Volume	7-9 AM Peak Hour		4-6 PM Peak Hour	
		Enter	Exit	Enter	Exit
Average Weekday	9690	190	569	644	379

	24-Hour Two-Way Volume	Peak Hour	
		Enter	Exit
Saturday	10226	514	438
Sunday	8890	462	409

Note: A zero rate indicates no rate data available

Source: Institute of Transportation Engineers Trip Generation, 7th Edition.

STEP 2: TRIP DISTRIBUTION

Travel Time Table

From \To	Area1	Area2	Area 3	Reno-Sparks	Fernley	Fallon	Dayton	Carson City	Yerington	Silver Spring	Stagecoach
Area 1	0	5	10	25	25	53	35	49	68	27	15
Area 2	5	0	5	30	30	58	30	44	63	22	10
Area 3	10	5	0	35	35	63	25	39	58	17	5
Reno - Sparks	25	30	35	0	40	70	54	40	105	56	67
Fernley	25	30	35	40	0	30	46	61	65	22	32
Fallon	53	58	63	70	30	0	61	75	75	30	40
Dayton	35	30	25	54	46	61	0	14	77	32	20
Carson City	49	44	39	40	61	75	14	0	91	46	34
Yerington	68	63	58	105	65	75	77	91	0	45	53
Silver Springs	27	22	17	56	22	30	32	46	45	0	12
Sagecoach	15	10	5	67	32	40	20	34	53	12	0

Pi*growth/ti^2

From \To	Area1	Area2	Area 3	Reno-Sparks	Fernley	Fallon	Dayton	Carson City	Yerington	Silver Spring	Stagecoach	**Total**	Population
Area 1	0	0	52	909	44	7	13	57	2	17	23	1124	0
Area 2	0	0	207	631	30	6	17	70	2	26	53	1043	0
Area 3	27	106	0	464	22	5	25	89	3	43	210	994	2661
Reno - Sparks	909	631	464	0	0	0	0	0	0	0	0	2005	285601
Fernley	44	30	22	0	0	0	0	0	0	0	0	97	11342
Fallon	7	6	5	0	0	0	0	0	0	0	0	18	8103
Dayton	13	17	25	0	0	0	0	0	0	0	0	55	6474
Carson City	57	70	89	0	0	0	0	0	0	0	0	216	56062
Yerington	2	2	3	0	0	0	0	0	0	0	0	6	3486
Silver Springs	17	26	43	0	0	0	0	0	0	0	0	86	5160
Sagecoach	23	53	210	0	0	0	0	0	0	0	0	286	2171
Total	1098	942	1121	2005	97	18	55	216	6	86	286	**5930**	381060

Population 2005	0	0	5184	285601	11342	8103	6474	56062	3486	5160	2171

	Internal Trips			External Trips										
From \To	**Area1**	**Area2**	**Area 3**	**Reno/Sparks**	**Fernley**	**Fallon**	**Dayton**	**Carson City**	**Yerington**	**Silver Springs**	**Stagecoach**			
Area 3	20.00%	80%		53.86%	2.60%	0.57%	2.91%	10.35%	0.29%	5.02%	24.40%			
Total	100.00%			100.00%										
% Share of Internal Employment	**0.00%**			**100.00%**										
Area 3 % Share	**0.00%**	**0.00%**		**53.86%**	**2.60%**	**0.57%**	**2.91%**	**10.35%**	**0.29%**	**5.02%**	**24.40%**	100.00%		
Area 1				84.84%	4.10%	0.65%	1.19%	5.27%	0.17%	1.60%	2.18%			
% Share of External Employment				**100.00%**										
Area 1 % Share				**84.84%**	**4.10%**	**0.65%**	**1.19%**	**5.27%**	**0.17%**	**1.60%**	**2.18%**	100.00%		
% Share of External Employment				**100.00%**										
Area 2				75.56%	3.65%	0.70%	2.08%	8.38%	0.25%	3.09%	6.29%			
Area 2 % Share				**75.56%**	**3.65%**	**0.70%**	**2.08%**	**8.38%**	**0.25%**	**3.09%**	**6.29%**	100.00%		

TRIP DISTRIBUTION

From \To	Area1	Area2	Area 3	Reno-Sparks	Fernley	Fallon	Dayton	Carson City	Yerington	Silver Spring	Stagecoach			
Area 1			0.00%	84.84%	4.10%	0.65%	1.19%	5.27%	0.17%	1.60%	2.18%	100.00%		
Area 2			0.00%	75.56%	3.65%	0.70%	2.08%	8.38%	0.25%	3.09%	6.29%	100.00%		
Area 3	0.00%	0.00%		53.86%	2.60%	0.57%	2.91%	10.35%	0.29%	5.02%	24.40%	100.00%		
Reno - Sparks	84.84%	75.56%	53.86%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
Fernley	4.10%	3.65%	2.60%	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
Fallon	0.65%	0.70%	0.57%	0.00%	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%			
Dayton	1.19%	2.08%	2.91%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%	0.00%			
Carson City	5.27%	8.38%	10.35%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%			
Yerington	0.17%	0.25%	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%			
Silver Springs	1.60%	3.09%	5.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%			
Sagecoach	2.18%	6.29%	24.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				

Mode Split

From \To	Area1	Area2	Area 3	Reno-Sparks	Fernley	Fallon	Dayton	Carson City	Yerington	Silver Spring	Stagecoach
Area 1			0.00%	2.55%	0.12%	0.02%	0.04%	0.16%	0.01%	0.05%	0.07%
Area 2			0.00%	2.27%	0.11%	0.02%	0.06%	0.25%	0.01%	0.09%	0.19%
Area 3	0.00%	0.00%		1.62%	0.08%	0.02%	0.09%	0.31%	0.01%	0.15%	0.73%
Reno - Sparks	2.55%	2.27%	1.62%								
Fernley	0.12%	0.11%	0.08%								
Fallon	0.02%	0.02%	0.02%								
Dayton	0.04%	0.06%	0.09%								
Carson City	0.16%	0.25%	0.31%								
Yerington	0.01%	0.01%	0.01%								
Silver Springs	0.05%	0.09%	0.15%								
Sagecoach	0.07%	0.19%	0.73%								

TRIP ASSIGNMENT (PERSON/HOUR) - TOTAL

USA PARKWAY		Area 1				Area 2				Area 3			
		AM		PM		AM		PM		AM		PM	
		Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Link 1	Stage Coach to Area 3	525	524	572	572	483	483	527	526	99	295	334	197
Link 2	Area 3 to Area 2	525	524	572	572	483	483	527	526	129	387	439	258
Link 3	Area 2 to Area 1	525	524	572	572	1879	1878	2050	2049	129	387	439	258
Link 4	Area 1 to Tracey Clark Interchange	4361	4360	4757	4756	1879	1878	2050	2049	129	387	439	258

TRIP ASSIGNMENT (PERSON/HOUR) - TOTAL

USA PARKWAY		Area 1				Area 2				Area 3			
		AM		PM		AM		PM		AM		PM	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Link 1	Stage Coach to Area 3	525	524	572	572	483	483	527	526	99	295	334	197
Link 2	Area 3 to Area 2	525	524	572	572	483	483	527	526	387	129	258	439
Link 3	Area 2 to Area 1	525	524	572	572	1878	1879	2049	2050	387	129	258	439
Link 4	Area 1 to Tracey Clark Interchange	4360	4361	4756	4757	1878	1879	2049	2050	387	129	258	439

TRIP ASSIGNMENT TRANSIT (Passenger/hour)

USA PARKWAY		Area 1				Area 2				Area 3			
		AM		PM		AM		PM		AM		PM	
		Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Link 1	Stage Coach to Area 3	16	16	17	17	14	14	16	16	3	9	10	6
Link 2	Area 3 to Area 2	16	16	17	17	14	14	16	16	4	12	13	8
Link 3	Area 2 to Area 1	16	16	17	17	14	14	16	16	4	12	13	8
Link 4	Area 1 to Tracey Clark Interchange	131	131	143	143	56	56	61	61	4	12	13	8

TRIP ASSIGNMENT TRANSIT (Passenger/hour)

USA PARKWAY		Area 1				Area 2				Area 3			
		AM		PM		AM		PM		AM		PM	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Link 1	Stage Coach to Area 3	16	16	17	17	14	14	16	16	3	9	10	6
Link 2	Area 3 to Area 2	16	16	17	17	14	14	16	16	12	4	8	13
Link 3	Area 2 to Area 1	16	16	17	17	14	14	16	16	12	4	8	13
Link 4	Area 1 to Tracey Clark Interchange	131	131	143	143	56	56	61	61	12	4	8	13

TRIP ASSIGNMENT TRANSIT (veh/hour)

USA PARKWAY		Area 1				Area 2				Area 3			
		AM		PM		AM		PM		AM		PM	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Link 1	Stage Coach to Area 3	0	0	0	0	0	0	0	0	0	0	0	0
Link 2	Area 3 to Area 2	0	0	0	0	0	0	0	0	0	0	0	0
Link 3	Area 2 to Area 1	0	0	0	0	0	0	0	0	0	0	0	0
Link 4	Area 1 to Tracey Clark Interchange	3	3	4	4	1	1	2	2	0	0	0	0

TRIP ASSIGNMENT (net pass/hour for vehicles)

USA PARKWAY		Area 1				Area 2				Area 3			
		AM		PM		AM		PM		AM		PM	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Link 1	Stage Coach to Area 3	509	509	555	555	468	468	511	511	96	286	324	191
Link 2	Area 3 to Area 2	509	509	555	555	468	468	511	511	376	125	250	425
Link 3	Area 2 to Area 1	509	509	555	555	1863	1864	2033	2034	376	125	250	425
Link 4	Area 1 to Tracey Clark Interchange	4229	4230	4613	4614	1822	1822	1987	1988	376	125	250	425

TRIP ASSIGNMENT (net veh/hour for vehicles)

USA PARKWAY		Area 1				Area 2				Area 3			
		AM		PM		AM		PM		AM		PM	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Link 1	Stage Coach to Area 3	424	424	463	462	390	390	426	426	80	239	270	159
Link 2	Area 3 to Area 2	424	424	463	462	390	390	426	426	313	105	209	354
Link 3	Area 2 to Area 1	424	424	463	462	1553	1554	1694	1695	313	105	209	354
Link 4	Area 1 to Tracey Clark Interchange	3524	3525	3844	3845	1518	1519	1656	1657	313	105	209	354

TRIP ASSIGNMENT TOTAL (veh/hour)

USA PARKWAY		Area 1				Area 2				Area 3			
		AM		PM		AM		PM		AM		PM	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Link 1	Stage Coach to Area 3	424	424	463	463	391	390	426	426	80	239	270	159
Link 2	Area 3 to Area 2	424	424	463	463	391	390	426	426	313	105	209	355
Link 3	Area 2 to Area 1	424	424	463	463	1553	1554	1695	1695	313	105	209	355
Link 4	Area 1 to Tracey Clark Interchange	3527	3528	3848	3849	1519	1520	1658	1658	313	105	209	355

USA PARKWAY		Total					
		AM		PM			
		NB	SB	NB	SB	Industrial	Residential
Link 1	Stage Coach to Area 3	895	1054	1160	1048	84.81%	15.19%
Link 2	Area 3 to Area 2	1129	919	1098	1244	71.47%	28.53%
Link 3	Area 2 to Area 1	2291	2083	2366	2513	85.88%	14.12%
Link 4	Area 1 to Tracey Clark Interchange	5360	5153	5714	5862	93.95%	6.05%

SOLAEGUI
ENGINEERS

Memorandum

Date: January 30, 2009

To: Vince Griffith, Reno Engineering

From: Paul Solaegui, Solaegui Engineers

RE: USA Parkway

NDOT memorandums dated January 9 and 21, 2009 indicate a projected traffic volume of 2,650 AADT on USA Parkway by 2010 and 4,120 AADT by 2030. The projections were determined based on the diversion of a percentage of traffic on U.S. 95A to USA Parkway. The projections assumed that one-third of the trips on U.S. 50 west, one-half of the trips on U.S. 95A south, and one-tenth of the trips on U.S. 50 east would have origins/destinations west of Fernley and would therefore divert to USA Parkway. We generally agree with NDOT's assumptions and methodology. However, we also estimated traffic volumes on USA Parkway based on a review of existing ADT's, projecting future growth of the Tahoe-Reno Industrial Center, and reviewing diverted and attracted traffic. Our traffic volume estimations are summarized below and illustrated on the attached figure.

1. Existing average daily traffic volumes (2007) were obtained from NDOT's 2007 Annual Traffic Report. The traffic volumes on USA Parkway and Waltham Way south of I-80 were estimated based on the total ramp volumes at each interchange.

2. Projected 2030 ADT volumes without the USA Parkway connection to U.S. 50 were subsequently reviewed based on the anticipated growth of the Tahoe-Reno Industrial Center (TRIC). The most recent 10 years of data at the Patrick and Tracy-Clark interchanges indicate a total growth of 4,670 ADT or 467 ADT per year which is assumed to be attributable to TRIC. Assuming that TRIC will follow the same pattern of growth results in an increase of 10,740 ADT for the 23 year period from 2007 to 2030. It is estimated that 75% of these additional trips will use the USA Parkway interchange and 25% will use the Patrick interchange resulting in an additional 8,060 ADT on USA Parkway south of I-80 and 2,680 ADT on Waltham Way south of I-80. Adding these additional trips to the existing volume results in 2030 ADT volumes of 11,760 on USA Parkway and 5,000 on Waltham Way. The 2030 ADT volume on U.S. 95A was estimated by applying a 2.23% average annual growth rate to the 2007 ADT volume. This growth rate was derived based on the 2010 and 2030 projected AADT's derived by NDOT.

3. The projected 2030 ADT volumes in step 2 were subsequently adjusted to account for the USA Parkway connection to U.S. 50 and the re-routing of TRIC traffic only. Existing traffic patterns indicate that approximately two-thirds of the traffic generated by TRIC arrives/departs from I-80 west and the remaining one-third arrives/departs from I-80 to the east. It is estimated that two-thirds of the traffic to the east has origins/destinations within

Solaegui Engineers Ltd. • 715 H Street • Sparks, Nevada 89431 • 775/358-1004 • FAX 775/358-1098
Civil & Traffic Engineers
e-mail: psolaegui@aol.com

Fernley or further east of Fernley and one-third has origins/destinations in the Silver Springs, Yerington, and Dayton areas. It was therefore assumed that 11% of the traffic volumes on USA Parkway and Waltham Way would re-route to USA Parkway to access U.S. 50. This amounts to a volume of approximately 1,840 ADT on the south section of USA Parkway.

4. The projected 2030 ADT volumes in step 3 were further adjusted to account for traffic on U.S. 95A, U.S. 50 west, and U.S. 50 east that may have origins/destinations west of Fernley and therefore would divert to USA Parkway from U.S. 95A. Per the NDOT methodology, it was assumed that one-third of the trips on U.S. 50 west, one-half of the trips on U.S. 95A south, and one-tenth of the trips on U.S. 50 east would have origins/destinations west of Fernley and would therefore divert to USA Parkway resulting in an additional 4,000 ADT on USA Parkway. Adding the 4,000 ADT to the 1,840 ADT from step 3 amounts to a total 2030 volume of 5,840 ADT on the south section of USA Parkway.

5. The projected 2030 ADT volumes in step 4 were further adjusted to account for the Highlands property located in Lyon County southeast of TRIC. The Highlands property includes 20,250 acres with an existing zoning of RR-5. This zoning allows 20 acre parcels which could accommodate 1,012 dwelling units. A conservative assumption of 6 trips per day per dwelling units would amount to a trip generation of 6,072 ADT for the Highlands property based on existing zoning. Assuming a directional distribution of 70% to the north and 30% to the south results in an additional 1,820 ADT on the south section of USA Parkway. Adding the 1,820 ADT to the 5,840 ADT from step 4 amounts to a total 2030 volume of 7,660 ADT on the south section of USA Parkway.

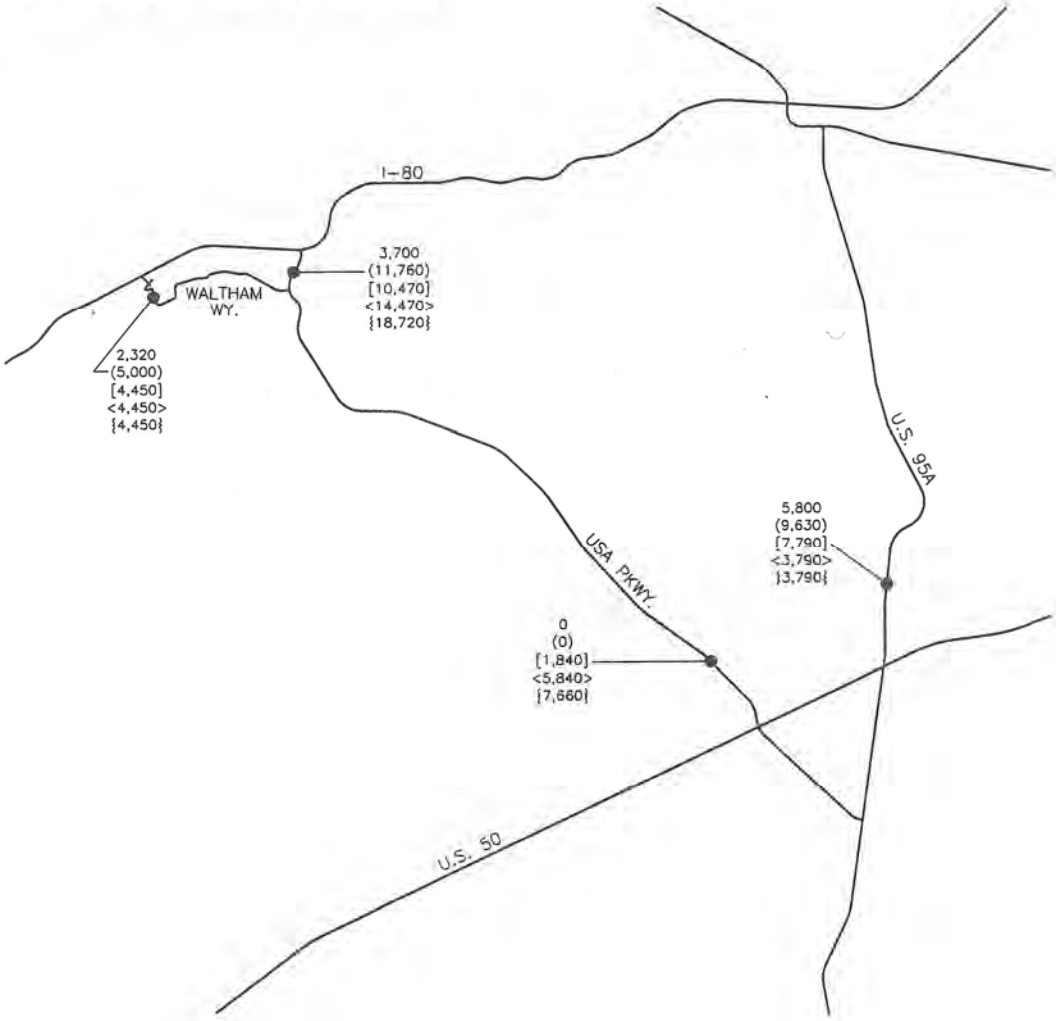
In summary, it is estimated that the section of USA Parkway just north of U.S. 50 will serve a projected 2030 volume of 7,660 ADT. This volume indicates that a two-lane roadway is needed. The traffic volumes presented above are based on existing zoning for the Highlands property. The Highlands Community Plan indicates that the property proposes much more intense land uses which appear to be reflected in the Lyon County Travel Demand Model study which shows a projected 2030 volume of 36,500 ADT on USA Parkway. This volume would indicate the need for a four-lane roadway, but this volume is not anticipated to be realized until after the year 2030.

SOLAEGUI
ENGINEERS LTD.

N.T.S.

LEGEND

- 2007 EXISTING
(-) 2030 W/O USA PKWY. CONNECTION
[-] 2030 W/USA PKWY. AND TRIC DIVERTED
<-> 2030 W/USA PKWY. AND CUT-THRU
{-} 2030 W/USA PKWY. AND HIGHLANDS



USA PARKWAY
TRAFFIC VOLUMES
FIGURE 1

Lawson, Mike W

From: Lawson, Mike W

Sent: Thursday, February 12, 2009 12:06 PM

To: PSOLAEGUI@aol.com

Cc: vince@recnv.com; Travis, Randy D; Larkin-Thomason, Tracy; Gibby, Adrain (Reed); Van Havel, Jason D; 'Tom Greco'; PGross@pbsj.com

Subject: Solaegui traffic study for USA Parkway extension

Attachments: USA Parkway.pdf

Hello Paul,

Thanks you for sending me your traffic memo (attached) for USA Parkway and for soliciting my comments. I concur with your methodology and assumptions with the following exception:

The additional volumes you assigned that are associated with TRIC employment were already accounted for in the trips I diverted from US 95A in my analysis. The following narrative is taken from my January 21, 2009 memorandum "Absent information to the contrary the new employment that will be attracted to the USA Parkway traffic analysis zone was assumed to mirror the current distribution of employees as reflected in existing travel patterns." The implication is that the existing TRIC work trips originating from the south are already captured on the US 95A link and were already reassigned 100 percent to the USA Parkway extension in my earlier analysis. The linear growth used for the total traffic on the link applies to the TRIC trips as well. Consequently, I do not agree with the additional 1,840 trips assigned in your analysis for these trips. However, given the variability in my own assumptions I would not argue with including this total for Design purposes.

Paul, I had advised proponents of this project last July that a traffic study was needed before NDOT could evaluate the Value of participating in this project. My concerns were ignored until December when I was instructed to perform a traffic study myself. Given that NDOT was pushed for an economic analysis for this project it has already been completed based on my traffic analysis. Considering there is only a minor increase in volumes associated with the "possible" Highland development we will not be adjusting our economic analysis at this late date to include them. Thanks for the opportunity to review and comment. Regards,

Michael W. Lawson
NDOT Traffic Information Division Chief
775-888-7443

Lawson, Mike W

From: Austin Osborne [aosborne@storeycounty.org]
Sent: Monday, January 05, 2009 8:29 AM
To: Lawson, Mike W
Subject: TRI Traffic Study

Hello Mike Lawson,
It's now the beginning of the new year and I have some materials pertaining to the TRI traffic study ready for your review. I have, however, had some issues with your e-mail address and don't want to send this information until I know you'll get it. I think I have the address correct this time. As I recall from our past discussions, I should have all materials from TRI in by the middle of January. There are still some companies at TRI straggling to get their information submitted. I will be contacting these companies by telephone and will submit what I attain from them as I received such. Please let me know what I can do further to help.
Sincerely,
Austin Osborne

Austin T. Osborne
Land Use Planner
Storey County Planning Department
Box 526 Virginia City, NV 89440
Office: 775.847.0966
Cell: 775.291.4693
Fax: 775.847.0935
aosborne@storeycounty.org

CONFIDENTIALITY DISCLAIMER:
This e-mail and any attachments are intended only for use by the addressee(s) named herein and may contain legally privileged and/or confidential information. If you are not the intended recipient, any dissemination, distribution or copying of this e-mail and any attachments is strictly prohibited. If you have received this e-mail in error, please immediately notify me and permanently delete the original and all copies and printouts of this e-mail and any attachments.

Employer Name	Addr	Street	Employees	Acres	Aver	Employees / Data Source / Date
AMERICO VENTURES	1280	Alexandria	21	1.84	11.41	21 / Manager / 01-02-08
THYCURB	711	Denmark	22	3.5	6.29	22 / Manager / 01-02-08
TACHIKARA	100	Ireland	39	2.00	19.50	39 / Manager / 01-02-08
FOOD BANK	550	Italy	12	9.04	1.33	12 / Manager / 01-02-08
EASY ROOTER	125	London	25	5.00	5.00	25 / Manager / 01-02-08
PPG Pittsburgh Paint	500/510/520	Pittsburgh	76	21.34	3.56	76 / Manager / 01-02-08
WAL*MART	2155	USA Parkway	750	140.00	5.36	750 / Manager / 12-27-/07
PETsMART	1200	Venice	425	57.08	7.45	425 / Manager / 06-01-08
MASTERFOODS USA (KalKan/Mars)	500	Waltham Way	96	109.84	0.87	96 / Manager / 01-02-08
1-800 FLOWERS / PLOW & HEARTH	625	Waltham Way	78	23.83	3.27	78 / Manager / 01-02-08
KUEHNE & NAGEL / Sprint	625	Waltham Way	23	23.83	0.97	23 / Manager / 01-02-08
RIVERS' END TRADING CO.	625	Waltham Way	53	23.83	2.22	53 / Manager / 01-02-08
STORMO	630	Waltham Way	3	3.00	1.00	
ROYAL SIERRA	710	Waltham Way	150	67.90	2.21	150 / Manager / 01-02-08
DELL	725	Waltham Way	350	17.44	20.07	
ACH FOAM	775	Waltham Way	67	15.78	4.25	67 / Manager / 01-02-08
ROYAL SIERRA	900	Waltham Way	350	17.44	20.07	350 / Manager / 01-02-08
ALCOA	1300	Waltham Way	23	21.04	1.09	23 / Manager / 01-02-08
SPPCo	1325	Waltham Way	112	8.32	13.46	
TEDESCO BUILDING	2920	Waltham Way	107	14.18	7.55	107 / Manager / 01-02-08
JAMES HARDIE	3000	Waltham Way	176	50.00	3.52	176 / Manager / 01-02-08
TIRE RACK	3300	Waltham Way	116	46.32	2.50	116 / Manager / 01-02-08
FNCB	610/620	Waltham Way	120	28.40	4.23	120 / Manager / 01-02-08
U.S. ORDINANCE	300	West Sydney	46	10.01	4.60	46 / Manager / 01-02-08
			3,240	**720.96**	**4.49**	
SEE JANE RUN	100	Ireland		2.00		
WELL, RENA M	150	Ireland		4.00		
ARROWHEAD ON EIGHTY	200	Ireland		4.01		
12 (MEPT USA Pkwy Dist Ctr)	201	Ireland		26.32		
TRI	300	Ireland		6.88		
TRI	425	Ireland		3.44		
MARLEHOD LLC	477	Ireland		3.04		
GOLDEN GATE / SET PETROLEUM	500	Ireland		5.79		
TRI	525	Ireland		5.06		

	125	London		5.00	
	131	London		3.65	
	235	London		5.00	
	375	London		7.72	
	485	London		9.95	
	589	London		14.84	
	703	London		14.84	
PROLOGIS	655	Waltham Way		18.36	
PROLOGIS	675	Waltham Way		13.48	
ROYBRIDGE / ROYAL EXTRUSIONS	710	Waltham Way		67.90	
PROLOGIS	1025	Waltham Way		25.93	
SHAW COMM	1170	Waltham Way		1.16	
FIRE STATION	1190	Waltham Way		0.94	
FIRE STATION	1200	Waltham Way		0.94	
GID WATER TANK	1250	Waltham Way		4.40	
ALCOA	1400	Waltham Way		51.84	
PROLOGIS	1500	Waltham Way		43.68	
SPPCo	2275	Waltham Way		2.39	
DURAFLEX	2355	Waltham Way		6.21	
SPPCo	2549	Waltham Way		16.00	
102 RANCH	2550	Waltham Way		15.44	
102 RANCH (Barrick)	2555	Waltham Way		15.00	
102 RANCH	2569	Waltham Way		15.00	
102 Ranch - BARRICK GOLDSTRIKE	2588	Waltham Way		10.57	
102 Ranch - WESTERN 102	2633	Waltham Way		12.83	
GOPHER CONSTRUCTION	2700	Waltham Way		111.08	
RIVER CANYON ENTRP	2729	Waltham Way		6.02	
RIVER CANYON ENTRP	2877	Waltham Way		6.02	
NDBS	2900	Waltham Way		5.88	
RIVER CANYON ENTRP	2903	Waltham Way		2.66	
TRI	2915	Waltham Way		18.60	
TRUCK & EQUIPMENT CTR	2920	Waltham Way		14.18	
PIONEER NUT	2955	Waltham Way		2.25	
PIONEER NUT	2999	Waltham Way		3.00	
TALL SALES INC	3033	Waltham Way		4.20	
PCMB GROUP	3135	Waltham Way		5.24	
WALTHAM WAY DEVELOPMENT	3225	Waltham Way		4.02	

102 RANCH	3275	Waltham Way		78.03		
WALTHAM WAY DEVELOPMENT	3315	Waltham Way		3.24		
USA PKWY DISTR CTR	3500	Waltham Way		5.96		
WALTHAM WAY DEVELOPMENT	3555	Waltham Way		28.03		**720.96**
102 RANCH - Blue Creek Venture	5575	Waltham Way		4.51		**814.43**
ROYBRIDGE / ROYAL EXTRUSIONS	710 a & b	Waltham Way		67.90		**1535.39**
						X 4.49
				814.43		**6893.90**

# of employees

Avg. employees @ $7.81

Tahoe Reno Industrial Center - Timeline

1997 - Alcoa and Kal Kan are constructed
1999 - TRI Center Development agreement signed
2002 - Sandmar and Nanawa are constructed
2006 to Present - Most of the development on USA Parkway is constructed including 1,000,000 square feet Wal-Mart distribution center and Pet-Smart distribution center

It has always been the TRI Center's desire that the I-80 to Hwy 50 connector (USA Parkway/805) would be the main solution for decreasing trips onto I-80. To date, 7 miles of the 17 total from the USA Parkway Interchange to the Ramsey-Weeks cutoff has been graded. Approximately 4 miles of the road have been paved with utilities.

Current Acreage (Sold)	**2,100**	**Current Employment**	**3,240**
*Current development includes 8,538,384 square feet of buildings *Of the 2,100 acres that have been sold about 70% (1,470) have been built out. *Figures are generated from 1999 thru 2008		*1.54 employees/acre	
Projected Additional Acreage	**6,800**	**Projected Additional Employment**	**10,200**
2,200 additional phase I not sold 4,600 recently rezoned buildable			
Projected Total Acreage	**8,900**	**Projected Total Employment**	**13,350**

TRI Park Bldg SQ FT

Date 1-22-08

	bldg sq ft w/ C of O
Crazy Chocolate Tear	19,580
Americo Ventures	31,196
Lambertson	30,715
Naniwa	24,800
TRI Sewer Plant	20,000
Thycurb MFG	35,604
Dis Plant	42,000
Associated Properties	13,820
	7,856
	13,820
	10,263
Ecocon	10,300
	10,300
	10,300
	10,300
Tachikara	30,000
Golden Gate Petroleum	2,400
Easy Rooter	12,250
vortex/viper steel	18,000
No. Nv rebar	15,000
RLC	11,961
Riverview comm. cntr	5,000
Tire Rack	310,960
PPG	98,591
Walmart	982,442
Walmart	1,000
Kal Kan	700,000
1st Nat.Collection Bureau	25,370
1-800-Flowers	100,000
Kuehne & Nagel	220,000
Rivers End	100,000
Frontier Fence	9,514
Eagle Global Logistics	300,000
Prologis NA3	180,000
ACH Foam	180,000
Royal Sierra	165,035
Able West	16,500
Alcoa	200,000
Barrick	300,000
Pioneer Nut	20,000
James Hardie Bldg Pro.	425,000
Penthouse Coaches	21,200
Bowen Investment	3,320
Fegert	4,000
Total	**4,748,397**

	under constr. Sq Ft
Petsmart	870,720
Food bank	62,000
McShane	556,000
West America Comm	690,000
Station #5 TRI	26,000
US Ordinance	65,000
Truck & Equip. Cnter	12,000
Golden Gate retail	15,000
Total	**2,296,720**

Now Finished

	Shell sq ft w/ C of O
TRIC 490	491,400
Prologis	601,000
Union Property	500,786
Total	**1,593,186**

	on Dean's Desk
Lainer	40,320
Kachina	30,000
Peru Point	20,000
Union Propety	600,000
???	300,000
Total	**990,320**

Bldg Sq Ft w/ C of O	4,748,397
Shell Sq Ft w/ C of O	1,593,186
under Constr. Sq Ft	2,296,720
on Dean Desk Sq FT	990,320
Total Bldg Sq Ft	**9,628,623**
Campus Conflicts	**4,000,000**
Total	**13,628,623**
Building Acres	312.8701331

- Trip generations
- Trucks
- Passenger vehicles
- Anticipate increase of truck & car increase
- When are expansions expected to open.
- Times of trip generations.
- At their convenience.
  - "Love to have be fine March"
  - Be.
- Counters here now.
- Logistics meeting by early '09

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

M E M O R A N D U M

January 9, 2009

PSD 4.00

TO: Jeff Lerud, Principal Traffic Engineer

FROM: Mike Lawson, Traffic Information Division Chief

SUBJECT: Design Designation for USA Parkway North of US 50

In response to a request from the Assistant Director-Planning, the following projected traffic values are provided for the subject project:

2010 AADT = 2,650

2030 AADT = 4,120

DHV = 390 (K-Factor = .095)

D = 57.0 %

T = 9 %

DHVT = 9 %

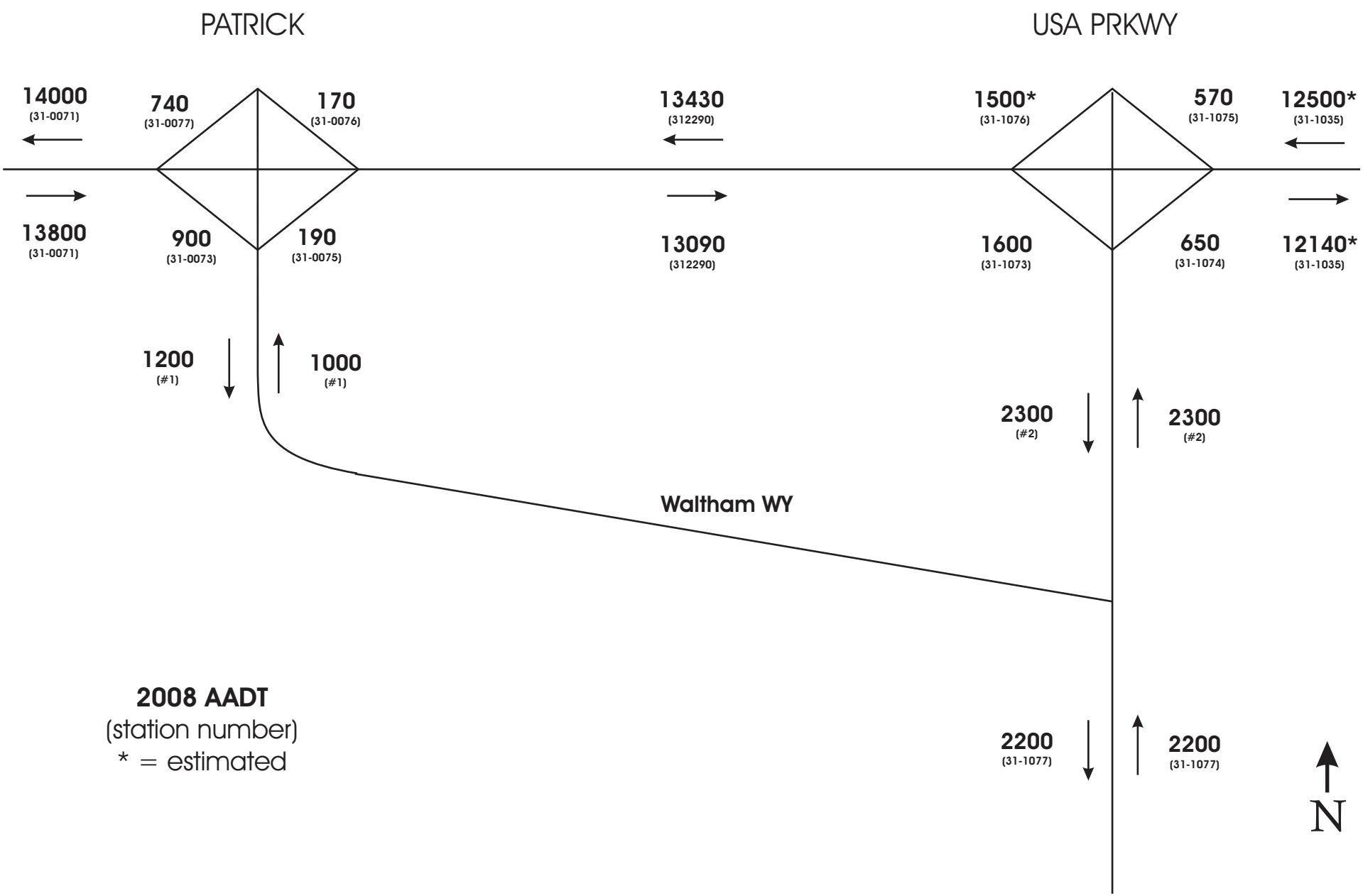
V = Design speed is not determined by The Traffic Information Division

The interim year AADT's are estimated below for the purpose of a rudimentary economic analysis of the potential benefits.

2011 = 2,720	2016 = 3,090	2021 = 3,460	2026 = 3,830
2012 = 2,800	2017 = 3,170	2022 = 3,530	2027 = 3,900
2013 = 2,870	2018 = 3,240	2023 = 3,610	2028 = 3,980
2014 = 2,940	2019 = 3,310	2024 = 3,680	2029 = 4,050
2015 = 3,020	2020 = 3,390	2025 = 3,750	

CC: Tracy Larkin-Thomason
Todd Montgomery
Reed Gibby
Paul Solaegui

I-80 @USA Prkwy



USA PARKWAY
South of I-80 USA Pkwy Int

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/04/08	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	0	112	42	3	6	7	0	1	14	0	1	0	3	4	193
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 PM	0	5	7	1	2	1	0	0	9	1	0	0	1	10	37
13:00	1	18	13	1	7	1	0	1	8	2	0	0	0	5	57
14:00	0	42	24	2	7	2	0	1	6	0	0	0	0	4	88
15:00	1	51	19	5	10	2	0	1	11	2	0	0	0	1	103
16:00	0	48	29	3	12	0	0	1	7	0	0	0	0	3	103
17:00	0	30	9	1	7	1	0	0	5	1	0	0	0	1	55
18:00	0	31	8	1	5	1	0	0	5	0	0	0	1	1	53
19:00	1	9	3	2	5	1	0	0	7	0	0	0	0	1	29
20:00	0	6	5	0	0	0	0	0	4	0	0	0	1	0	16
21:00	0	4	3	2	0	0	0	0	1	0	0	0	0	5	15
22:00	0	7	1	0	1	0	0	0	4	0	0	0	0	0	13
23:00	0	8	5	0	1	1	0	0	1	0	0	0	0	0	16
Total	3	371	168	21	63	17	0	5	82	6	1	0	6	35	778
Percent	0.4%	47.7%	21.6%	2.7%	8.1%	2.2%	0.0%	0.6%	10.5%	0.8%	0.1%	0.0%	0.8%	4.5%	
AM Peak		02:00	02:00	02:00	02:00	02:00		02:00	02:00		02:00		02:00	02:00	02:00
Vol.		112	42	3	6	7		1	14		1		3	4	193
PM Peak	13:00	15:00	16:00	15:00	16:00	14:00		13:00	15:00	13:00			12:00	12:00	15:00
Vol.	1	51	29	5	12	2		1	11	2			1	10	103

USA PARKWAY
South of I-80 USA Pkwy Int

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/05/08	0	15	3	1	1	1	0	0	2	0	0	0	0	0	23
01:00	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	15	2	1	1	0	0	0	1	0	0	0	0	0	20
04:00	0	7	2	0	1	0	0	0	7	0	0	0	0	1	18
05:00	0	5	2	1	0	1	0	0	2	1	0	0	0	3	15
06:00	0	5	5	0	0	2	0	0	8	1	0	0	1	1	23
07:00	0	6	1	2	6	2	0	1	7	0	0	0	0	3	28
08:00	0	10	6	1	5	0	1	1	1	0	0	0	0	2	27
09:00	1	4	8	0	2	0	0	0	4	1	0	0	1	2	23
10:00	0	8	6	1	4	1	0	1	15	0	0	0	1	2	39
11:00	0	9	9	1	2	0	0	0	13	0	0	0	0	1	35
12 PM	1	18	8	1	3	0	0	1	10	3	0	0	0	10	55
13:00	0	22	7	3	5	0	0	3	9	0	0	0	0	0	49
14:00	0	24	16	0	5	0	0	1	7	1	0	0	1	2	57
15:00	0	39	15	1	10	1	0	0	5	1	0	0	1	1	74
16:00	0	38	17	1	11	0	0	1	6	1	0	0	1	2	78
17:00	0	26	8	3	6	2	0	3	4	0	0	0	0	0	52
18:00	0	40	11	0	2	1	1	0	3	0	0	0	0	2	60
19:00	0	16	7	0	1	2	0	0	1	1	0	0	0	1	29
20:00	0	6	4	0	0	0	0	0	2	0	0	0	1	1	14
21:00	0	10	3	0	0	0	0	0	2	0	0	0	0	0	15
22:00	0	16	3	0	0	0	0	0	2	0	0	0	0	0	21
23:00	0	7	2	1	1	0	0	0	2	0	0	0	0	0	13
Total	2	352	146	18	66	14	2	12	113	10	0	0	7	34	776
Percent	0.3%	45.4%	18.8%	2.3%	8.5%	1.8%	0.3%	1.5%	14.6%	1.3%	0.0%	0.0%	0.9%	4.4%	
AM Peak	09:00	00:00	11:00	07:00	07:00	06:00	08:00	07:00	10:00	05:00			06:00	05:00	10:00
Vol.	1	15	9	2	6	2	1	1	15	1			1	3	39
PM Peak	12:00	18:00	16:00	13:00	16:00	17:00	18:00	13:00	12:00	12:00			14:00	12:00	16:00
Vol.	1	40	17	3	11	2	1	3	10	3			1	10	78

USA PARKWAY
South of I-80 USA Pkwy Int

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/06/08	1	11	1	1	0	1	0	0	1	0	0	0	0	1	17
01:00	0	1	3	0	1	1	0	0	0	0	0	0	0	0	6
02:00	0	2	2	0	0	0	0	0	2	0	0	0	0	0	6
03:00	0	6	0	0	0	0	0	0	4	0	0	0	0	0	10
04:00	0	0	3	0	0	0	0	0	1	0	0	0	0	0	4
05:00	0	3	0	2	0	1	0	0	3	0	0	0	0	1	10
06:00	1	6	3	1	1	2	0	1	4	0	0	0	0	3	22
07:00	0	3	1	0	3	0	0	0	4	0	0	0	2	0	13
08:00	0	9	4	1	1	0	0	0	5	0	0	0	0	0	20
09:00	0	5	4	2	1	1	0	1	9	1	0	0	0	1	25
10:00	0	6	4	0	3	1	0	0	7	0	0	0	0	0	21
11:00	0	9	9	1	1	0	0	1	5	2	0	0	0	4	32
12 PM	0	17	4	0	1	0	0	1	7	2	0	0	0	3	35
13:00	0	17	3	0	2	1	0	1	3	0	0	0	0	3	30
14:00	0	20	3	1	3	0	0	0	4	1	0	0	0	2	34
15:00	1	19	7	1	4	2	0	0	1	1	0	0	0	1	37
16:00	0	25	8	0	6	1	0	0	2	0	0	0	0	1	43
17:00	0	9	5	0	2	1	0	0	3	0	0	0	0	0	20
18:00	0	25	8	0	3	1	0	0	6	0	0	0	0	0	43
19:00	1	2	2	2	3	1	0	0	2	0	0	0	0	0	13
20:00	0	8	5	0	5	0	0	0	2	0	0	0	0	0	20
21:00	1	2	1	0	3	1	0	0	5	0	0	0	0	1	14
22:00	0	7	2	0	1	1	0	0	1	0	0	0	0	0	12
23:00	0	6	2	0	0	0	0	0	3	0	0	0	0	0	11
Total	5	218	84	12	44	16	0	5	84	7	0	0	2	21	498
Percent	1.0%	43.8%	16.9%	2.4%	8.8%	3.2%	0.0%	1.0%	16.9%	1.4%	0.0%	0.0%	0.4%	4.2%	
AM Peak	00:00	00:00	11:00	05:00	07:00	06:00		06:00	09:00	11:00			07:00	11:00	11:00
Vol.	1	11	9	2	3	2		1	9	2			2	4	32
PM Peak	15:00	16:00	16:00	19:00	16:00	15:00		12:00	12:00	12:00				12:00	16:00
Vol.	1	25	8	2	6	2		1	7	2				3	43

USA PARKWAY
South of I-80 USA Pkwy Int

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/07/08	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	4	2	0	0	1	0	0	1	0	0	0	0	0	8
02:00	0	3	3	0	0	2	0	0	0	0	0	0	0	0	8
03:00	0	2	1	1	1	1	0	0	0	0	0	0	0	0	6
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	1	3	1	1	0	1	0	0	1	0	0	0	0	0	8
06:00	0	4	2	1	0	0	0	0	2	0	0	0	0	1	10
07:00	0	3	1	1	0	0	0	0	3	0	0	0	0	1	9
08:00	0	3	2	2	2	0	0	1	6	0	0	0	0	3	19
09:00	0	6	5	1	1	1	0	0	3	0	0	0	0	0	17
10:00	1	3	2	0	0	0	0	0	7	0	0	0	1	2	16
11:00	0	4	3	0	1	1	0	0	7	0	0	0	1	3	20
12 PM	1	20	6	1	5	1	0	0	6	2	0	1	1	3	47
13:00	0	11	6	0	2	1	0	2	4	1	0	0	0	2	29
14:00	1	12	4	0	1	0	0	0	6	0	0	0	0	1	25
15:00	0	23	12	1	3	0	0	1	4	0	0	0	0	0	44
16:00	0	24	6	2	5	1	0	0	5	0	0	0	0	1	44
17:00	1	13	6	1	3	0	0	0	2	0	0	0	0	0	26
18:00	1	23	6	0	3	1	0	0	3	0	0	0	0	2	39
19:00	0	8	0	0	1	1	0	0	5	0	0	0	0	1	16
20:00	0	1	3	0	2	0	0	0	1	0	0	0	0	0	7
21:00	1	7	0	0	0	0	0	0	1	0	0	0	0	1	10
22:00	0	2	0	0	0	1	0	0	3	0	0	0	0	0	6
23:00	0	5	1	0	0	0	0	0	0	0	0	0	0	0	6
Total	7	193	72	12	30	13	0	4	70	3	0	1	3	21	429
Percent	1.6%	45.0%	16.8%	2.8%	7.0%	3.0%	0.0%	0.9%	16.3%	0.7%	0.0%	0.2%	0.7%	4.9%	
AM Peak	05:00	00:00	09:00	08:00	08:00	02:00		08:00	10:00				10:00	08:00	11:00
Vol.	1	7	5	2	2	2		1	7				1	3	20
PM Peak	12:00	16:00	15:00	16:00	12:00	12:00		13:00	12:00	12:00		12:00	12:00	12:00	12:00
Vol.	1	24	12	2	5	1		2	6	2		1	1	3	47

USA PARKWAY
South of I-80 USA Pkwy Int

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/08/08	0	5	4	0	0	2	0	0	3	0	0	1	0	1	16
01:00	0	2	0	0	0	1	0	0	1	0	0	0	0	0	4
02:00	0	1	2	0	0	0	0	0	2	0	0	0	0	0	5
03:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	3	0	0	1	1	0	0	0	0	0	0	0	0	5
05:00	0	3	2	1	0	0	0	0	0	0	0	0	0	2	8
06:00	1	5	6	2	1	0	0	0	5	1	0	0	1	2	24
07:00	0	2	3	0	4	0	0	2	11	0	0	0	0	5	27
08:00	2	2	4	2	5	1	0	1	10	0	0	0	0	5	32
09:00	0	8	6	1	2	1	0	1	14	0	2	0	0	2	37
10:00	1	11	5	5	3	0	0	3	9	0	6	1	1	5	50
11:00	1	10	8	2	5	3	0	2	11	3	1	0	1	5	52
12 PM	0	8	1	0	3	1	0	2	11	1	0	1	0	2	30
13:00	0	9	6	3	3	0	0	0	12	2	0	0	0	3	38
14:00	0	24	16	3	5	1	0	0	10	1	0	0	0	0	60
15:00	0	47	24	1	7	0	0	0	7	0	0	0	0	3	89
16:00	2	63	19	2	10	1	0	1	6	0	0	0	0	1	105
17:00	2	36	6	0	7	3	0	1	1	0	0	0	0	3	59
18:00	0	20	6	2	6	1	0	1	3	0	0	0	0	2	41
19:00	3	12	3	0	1	0	0	1	5	0	0	0	0	1	26
20:00	0	4	2	0	0	1	0	0	3	0	0	0	0	1	11
21:00	0	6	2	0	0	1	0	0	3	0	0	0	0	0	12
22:00	0	6	2	1	0	0	0	0	0	0	0	0	0	0	9
23:00	1	6	0	0	0	1	0	0	1	0	0	0	0	0	9
Total	13	293	129	25	63	19	0	15	128	8	9	3	3	43	751
Percent	1.7%	39.0%	17.2%	3.3%	8.4%	2.5%	0.0%	2.0%	17.0%	1.1%	1.2%	0.4%	0.4%	5.7%	
AM Peak	08:00	10:00	11:00	10:00	08:00	11:00		10:00	09:00	11:00	10:00	00:00	06:00	07:00	11:00
Vol.	2	11	8	5	5	3		3	14	3	6	1	1	5	52
PM Peak	19:00	16:00	15:00	13:00	16:00	17:00		12:00	13:00	13:00		12:00		13:00	16:00
Vol.	3	63	24	3	10	3		2	12	2		1		3	105

USA PARKWAY
South of I-80 USA Pkwy Int

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/09/08	0	6	2	0	0	1	0	0	2	0	0	0	0	1	12
01:00	1	4	0	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	5	2	2	0	1	0	1	1	0	0	0	0	3	15
03:00	0	1	1	1	0	1	0	2	1	0	0	0	0	3	10
04:00	0	18	2	0	2	1	0	0	0	0	0	0	0	0	23
05:00	0	6	2	0	1	1	0	0	3	1	0	0	0	4	18
06:00	0	12	6	0	4	1	0	5	0	2	0	0	0	4	34
07:00	0	5	4	1	3	1	0	3	2	0	0	0	0	4	23
08:00	0	8	8	4	4	0	0	4	7	1	0	0	0	6	42
09:00	0	7	11	4	3	0	0	5	8	1	1	0	0	9	49
10:00	0	10	4	3	4	2	0	2	5	0	0	0	0	3	33
11:00	0	20	6	2	4	2	0	1	10	0	2	0	0	3	50
12 PM	1	23	11	4	4	1	0	3	6	0	4	0	0	2	59
13:00	1	12	7	1	8	1	0	1	10	0	0	0	0	0	41
14:00	0	28	16	3	4	0	0	3	4	0	0	0	0	2	60
15:00	1	38	15	2	18	3	0	3	1	0	0	0	0	1	82
16:00	0	62	25	4	6	3	0	1	6	0	0	0	0	4	111
17:00	0	29	10	3	4	0	0	5	5	0	0	0	0	5	61
18:00	0	18	6	1	4	0	0	1	2	0	0	0	0	3	35
19:00	1	8	3	1	3	0	0	3	4	0	0	0	0	4	27
20:00	0	6	1	1	2	4	0	1	0	0	0	0	0	2	17
21:00	0	5	1	0	1	0	0	2	2	0	0	0	1	1	13
22:00	0	7	2	1	0	0	0	0	0	0	0	0	0	0	10
23:00	0	5	2	0	1	0	0	1	1	0	0	0	0	1	11
Total	5	343	147	38	80	23	0	47	80	5	7	0	1	65	841
Percent	0.6%	40.8%	17.5%	4.5%	9.5%	2.7%	0.0%	5.6%	9.5%	0.6%	0.8%	0.0%	0.1%	7.7%	
AM Peak	01:00	11:00	09:00	08:00	06:00	10:00		06:00	11:00	06:00	11:00			09:00	11:00
Vol.	1	20	11	4	4	2		5	10	2	2			9	50
PM Peak	12:00	16:00	16:00	12:00	15:00	20:00		17:00	13:00		12:00		21:00	17:00	16:00
Vol.	1	62	25	4	18	4		5	10		4		1	5	111

USA PARKWAY
South of I-80 USA Pkwy Int

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/10/08	0	11	2	0	0	0	0	1	1	0	0	0	0	1	16
01:00	0	4	0	0	0	0	0	1	2	0	0	0	0	2	9
02:00	0	14	3	0	0	0	0	0	1	0	0	0	0	0	18
03:00	0	8	2	1	0	0	0	0	0	0	0	0	0	1	12
04:00	1	4	3	1	0	0	0	3	0	0	0	0	0	3	15
05:00	0	5	2	0	0	1	0	2	2	0	0	0	0	4	16
06:00	0	7	5	0	2	1	0	1	1	0	0	0	0	1	18
07:00	0	8	3	0	4	0	0	3	5	1	0	0	0	5	29
08:00	2	12	3	1	2	0	0	1	4	0	0	0	1	3	29
09:00	1	3	4	3	6	1	0	6	8	0	0	0	0	5	37
10:00	1	8	6	1	3	0	0	3	12	0	0	0	0	1	35
11:00	0	14	7	2	8	0	0	5	5	1	0	0	0	10	52
12 PM	0	13	10	2	4	2	0	4	9	1	0	0	1	2	48
13:00	0	20	8	1	5	1	0	2	6	0	0	0	0	4	47
14:00	0	32	15	0	1	1	0	1	6	0	0	0	0	1	57
15:00	1	56	22	1	11	1	0	4	8	1	0	0	0	2	107
16:00	1	66	26	1	9	1	0	4	3	0	0	0	1	9	121
17:00	0	31	6	0	0	1	0	2	2	0	0	0	0	4	46
18:00	2	103	35	6	23	8	1	4	35	3	0	0	1	5	226
19:00	0	64	34	7	11	10	0	8	27	0	0	0	0	4	165
20:00	1	38	26	3	10	2	0	5	21	0	0	0	2	12	120
21:00	1	99	24	7	5	5	0	4	16	0	0	0	1	5	167
22:00	0	35	10	0	8	3	0	3	16	0	0	0	0	5	80
23:00	0	16	6	0	4	5	0	1	8	0	0	0	0	1	41
Total	11	671	262	37	116	43	1	68	198	7	0	0	7	90	1511
Percent	0.7%	44.4%	17.3%	2.4%	7.7%	2.8%	0.1%	4.5%	13.1%	0.5%	0.0%	0.0%	0.5%	6.0%	
AM Peak	08:00	02:00	11:00	09:00	11:00	05:00		09:00	10:00	07:00			08:00	11:00	11:00
Vol.	2	14	7	3	8	1		6	12	1			1	10	52
PM Peak	18:00	18:00	18:00	19:00	18:00	19:00	18:00	19:00	18:00	18:00			20:00	20:00	18:00
Vol.	2	103	35	7	23	10	1	8	35	3			2	12	226

USA PARKWAY
South of I-80 USA Pkwy Int

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/11/08	1	16	6	3	1	4	0	0	9	0	0	0	0	2	42
01:00	0	15	9	2	1	2	0	1	14	0	0	0	0	2	46
02:00	0	15	1	2	0	4	0	1	20	0	0	0	0	0	43
03:00	0	30	5	2	2	2	0	1	15	0	0	0	0	2	59
04:00	0	7	3	4	1	0	0	0	10	0	0	0	0	1	26
05:00	0	8	5	0	0	2	0	0	8	0	0	0	1	3	27
06:00	0	19	8	4	5	0	0	1	16	0	1	0	1	4	59
07:00	0	77	19	2	4	2	0	2	13	0	0	0	0	6	125
08:00	0	106	33	2	9	2	0	3	13	1	0	0	0	9	178
09:00	2	120	40	3	9	1	0	7	23	0	0	0	1	10	216
10:00	0	133	77	2	31	2	0	5	26	0	3	0	4	10	293
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	3	546	206	26	63	21	0	21	167	1	4	0	7	49	1114
Percent	0.3%	49.0%	18.5%	2.3%	5.7%	1.9%	0.0%	1.9%	15.0%	0.1%	0.4%	0.0%	0.6%	4.4%	
AM Peak	09:00	10:00	10:00	04:00	10:00	00:00		09:00	10:00	08:00	10:00		10:00	09:00	10:00
Vol.	2	133	77	4	31	4		7	26	1	3		4	10	293
PM Peak															
Vol.															
Grand Total	49	2987	1214	189	525	166	3	177	922	47	21	4	36	358	6698
Percent	0.7%	44.6%	18.1%	2.8%	7.8%	2.5%	0.0%	2.6%	13.8%	0.7%	0.3%	0.1%	0.5%	5.3%	

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

USA PARKWAY
0.35 Miles South of Waltham Way

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/04/08	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	2	86	58	7	30	13	0	6	45	1	0	0	0	10	258
13:00	1	93	32	11	15	14	0	5	45	0	0	0	0	7	223
14:00	1	176	81	9	18	10	0	2	36	0	0	0	0	9	342
15:00	1	149	72	13	32	9	0	10	36	1	0	0	0	1	324
16:00	0	122	48	14	28	2	0	5	35	0	0	0	0	3	257
17:00	0	102	30	10	9	3	0	1	23	1	0	0	0	3	182
18:00	0	33	13	1	6	4	0	2	25	0	0	0	1	2	87
19:00	0	28	5	3	3	8	0	0	21	0	0	0	0	1	69
20:00	1	6	4	2	3	3	0	0	8	0	0	0	0	0	27
21:00	0	13	9	2	0	1	0	1	17	0	0	0	0	0	43
22:00	1	37	8	0	2	2	0	0	14	0	0	0	0	1	65
23:00	1	23	11	1	0	10	0	0	19	0	0	0	0	0	65
Total	8	868	371	73	146	79	0	32	324	3	0	0	1	37	1942
Percent	0.4%	44.7%	19.1%	3.8%	7.5%	4.1%	0.0%	1.6%	16.7%	0.2%	0.0%	0.0%	0.1%	1.9%	
AM Peak Vol.															
PM Peak Vol.	12:00 2	14:00 176	14:00 81	16:00 14	15:00 32	13:00 14		15:00 10	12:00 45	12:00 1			18:00 1	12:00 10	14:00 342

USA PARKWAY
0.35 Miles South of Waltham Way

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/05/08	0	31	7	3	0	5	0	0	10	0	0	0	0	0	56
01:00	0	8	3	0	2	3	0	0	5	0	0	0	0	1	22
02:00	1	16	9	3	1	0	0	0	11	0	0	0	0	1	42
03:00	0	105	31	0	2	2	0	0	10	0	0	1	0	1	152
04:00	1	98	32	0	4	2	0	0	8	0	0	0	0	2	147
05:00	1	85	25	4	12	4	0	0	18	0	0	0	0	2	151
06:00	0	58	36	6	15	2	0	1	22	0	0	0	4	3	147
07:00	1	82	34	2	11	9	0	1	24	0	0	0	3	4	171
08:00	1	24	25	12	13	12	0	6	29	3	0	0	4	8	137
09:00	1	45	24	9	12	9	0	6	34	1	0	0	4	8	153
10:00	1	39	22	14	23	17	0	4	39	1	0	0	6	8	174
11:00	1	59	27	10	21	14	0	5	40	0	0	0	3	17	197
12 PM	1	115	58	11	26	18	0	6	49	0	0	0	4	11	299
13:00	1	100	47	7	13	11	0	6	45	0	0	0	6	14	250
14:00	3	160	72	4	31	12	0	5	39	3	0	0	0	5	334
15:00	0	87	42	3	19	5	0	9	30	0	0	0	0	3	198
16:00	1	73	16	7	11	5	0	11	24	0	0	0	0	2	150
17:00	2	34	15	8	5	7	0	1	18	0	0	0	0	2	92
18:00	2	60	16	1	7	8	0	0	22	0	0	0	0	1	117
19:00	0	36	10	0	2	4	0	1	14	0	0	1	0	2	70
20:00	0	6	4	2	0	2	0	0	10	0	0	0	0	1	25
21:00	0	30	7	1	0	1	0	0	15	0	0	0	0	1	55
22:00	1	42	11	4	3	7	0	0	10	0	0	0	0	0	78
23:00	1	22	6	5	0	3	0	0	7	0	0	0	0	0	44
Total	20	1415	579	116	233	162	0	62	533	8	0	2	34	97	3261
Percent	0.6%	43.4%	17.8%	3.6%	7.1%	5.0%	0.0%	1.9%	16.3%	0.2%	0.0%	0.1%	1.0%	3.0%	
AM Peak	02:00	03:00	06:00	10:00	10:00	10:00		08:00	11:00	08:00		03:00	10:00	11:00	11:00
Vol.	1	105	36	14	23	17		6	40	3		1	6	17	197
PM Peak	14:00	14:00	14:00	12:00	14:00	12:00		16:00	12:00	14:00		19:00	13:00	13:00	14:00
Vol.	3	160	72	11	31	18		11	49	3		1	6	14	334

USA PARKWAY
0.35 Miles South of Waltham Way

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/06/08	1	4	1	6	0	4	0	0	16	0	0	0	0	1	33
01:00	0	8	3	3	1	4	0	0	10	0	0	0	0	1	30
02:00	1	16	8	4	0	1	0	0	11	0	0	0	0	0	41
03:00	0	91	18	6	3	0	0	0	7	0	0	0	0	0	125
04:00	0	83	19	3	3	0	0	0	10	1	0	0	0	0	119
05:00	0	62	20	5	5	1	0	0	15	0	0	0	0	2	110
06:00	1	18	4	1	1	2	0	0	19	0	0	0	0	0	46
07:00	0	11	7	5	3	6	0	0	21	1	0	0	0	1	55
08:00	0	18	5	5	6	2	0	0	32	0	0	0	0	0	68
09:00	0	24	10	2	3	4	0	0	28	0	0	0	0	0	71
10:00	2	22	10	8	7	8	1	0	28	0	0	0	0	4	90
11:00	1	37	26	8	8	13	0	1	38	0	0	0	0	5	137
12 PM	0	48	15	4	5	11	0	0	31	0	0	0	0	3	117
13:00	1	64	17	3	9	6	0	0	39	0	0	0	1	3	143
14:00	0	108	39	2	4	4	0	0	22	0	0	0	0	2	181
15:00	0	57	20	2	5	3	0	0	14	0	0	0	0	0	101
16:00	0	33	12	4	2	4	0	0	22	0	0	0	0	0	77
17:00	1	30	9	2	5	11	0	0	13	0	0	0	0	1	72
18:00	1	21	9	10	1	7	0	0	25	0	0	0	0	3	77
19:00	0	17	1	4	1	5	0	0	17	0	0	0	0	0	45
20:00	0	11	4	2	5	3	0	0	12	0	0	0	0	2	39
21:00	0	5	1	2	1	3	0	1	20	0	0	0	0	2	35
22:00	2	7	2	5	0	6	0	0	10	0	0	0	0	2	34
23:00	1	18	3	4	0	3	0	0	12	0	0	0	0	1	42
Total	12	813	263	100	78	111	1	2	472	2	0	0	1	33	1888
Percent	0.6%	43.1%	13.9%	5.3%	4.1%	5.9%	0.1%	0.1%	25.0%	0.1%	0.0%	0.0%	0.1%	1.7%	
AM Peak	10:00	03:00	11:00	10:00	11:00	11:00	10:00	11:00	11:00	04:00				11:00	11:00
Vol.	2	91	26	8	8	13	1	1	38	1				5	137
PM Peak	22:00	14:00	14:00	18:00	13:00	12:00		21:00	13:00				13:00	12:00	14:00
Vol.	2	108	39	10	9	11		1	39				1	3	181

USA PARKWAY
0.35 Miles South of Waltham Way

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/07/08	1	22	7	0	0	5	0	1	7	0	0	0	0	1	44
01:00	1	12	3	4	2	2	1	0	10	0	0	0	0	1	36
02:00	0	34	11	0	1	4	0	0	8	0	0	0	0	0	58
03:00	1	82	15	1	2	2	0	0	6	0	0	0	0	2	111
04:00	0	66	19	1	3	1	0	0	3	0	0	0	0	0	93
05:00	1	58	13	7	5	2	0	0	6	0	0	0	0	0	92
06:00	2	16	5	4	1	2	0	0	11	0	0	0	0	1	42
07:00	0	13	5	2	1	1	0	0	15	0	0	0	0	3	40
08:00	0	9	2	4	7	5	0	0	18	0	0	0	0	2	47
09:00	0	15	9	3	1	8	0	0	19	0	0	0	0	1	56
10:00	0	15	4	6	0	10	0	0	34	0	0	0	0	1	70
11:00	1	14	10	3	2	8	0	0	36	0	0	0	0	3	77
12 PM	1	54	22	7	3	10	0	0	41	0	0	0	1	0	139
13:00	0	62	22	2	1	0	0	0	30	0	0	0	0	1	118
14:00	1	77	23	7	4	6	0	0	23	1	0	0	0	0	142
15:00	0	57	23	5	4	4	0	0	15	0	0	0	0	1	109
16:00	1	56	10	11	1	5	0	0	26	0	0	0	0	1	111
17:00	1	21	7	14	5	2	0	1	22	0	0	0	0	6	79
18:00	0	26	11	11	5	5	0	1	13	0	0	0	0	5	77
19:00	2	17	1	6	0	8	0	0	16	0	0	0	0	2	52
20:00	0	6	0	0	0	1	0	0	6	0	0	0	0	0	13
21:00	0	24	4	10	1	2	0	0	9	0	0	0	0	2	52
22:00	0	5	4	6	1	6	0	0	19	0	0	0	0	0	41
23:00	1	15	6	1	0	5	0	0	11	0	0	0	0	2	41
Total	14	776	236	115	50	104	1	3	404	1	0	0	1	35	1740
Percent	0.8%	44.6%	13.6%	6.6%	2.9%	6.0%	0.1%	0.2%	23.2%	0.1%	0.0%	0.0%	0.1%	2.0%	
AM Peak	06:00	03:00	04:00	05:00	08:00	10:00	01:00	00:00	11:00					07:00	03:00
Vol.	2	82	19	7	7	10	1	1	36					3	111
PM Peak	19:00	14:00	14:00	17:00	17:00	12:00		17:00	12:00	14:00			12:00	17:00	14:00
Vol.	2	77	23	14	5	10		1	41	1			1	6	142

USA PARKWAY
0.35 Miles South of Waltham Way

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/08/08	0	38	9	0	1	4	0	0	13	0	0	1	0	4	70
01:00	0	7	4	7	0	2	0	0	3	0	0	0	0	0	23
02:00	1	21	6	1	3	2	0	0	4	0	0	0	0	0	38
03:00	0	74	16	4	1	1	0	0	6	0	0	0	0	0	102
04:00	2	70	17	1	3	4	0	0	4	0	0	0	0	1	102
05:00	2	122	50	13	10	2	0	0	8	0	0	0	0	5	212
06:00	2	69	48	6	30	5	0	1	14	0	0	0	0	6	181
07:00	0	72	22	5	12	8	0	4	23	0	0	0	0	5	151
08:00	0	33	25	8	13	13	0	4	28	0	0	0	0	16	140
09:00	1	40	22	8	18	11	0	5	32	0	0	0	0	8	145
10:00	2	45	44	12	6	13	0	7	44	1	0	0	1	4	179
11:00	0	43	42	8	16	12	0	6	48	0	0	0	0	4	179
12 PM	4	71	37	8	30	10	0	5	29	0	0	1	0	8	203
13:00	1	78	44	10	27	7	0	6	40	2	0	0	0	8	223
14:00	2	81	52	8	21	12	0	1	33	1	1	0	1	9	222
15:00	2	149	62	9	26	16	0	13	28	0	0	0	0	6	311
16:00	2	141	50	8	30	8	0	6	39	0	1	0	0	7	292
17:00	0	102	30	6	15	6	0	3	17	0	0	0	0	5	184
18:00	2	25	15	5	6	5	0	2	16	0	0	0	0	5	81
19:00	2	24	6	4	4	4	0	0	14	0	0	0	0	5	63
20:00	0	2	5	2	5	5	0	3	9	0	0	2	0	4	37
21:00	0	8	1	7	2	7	0	5	19	0	0	0	0	10	59
22:00	1	6	4	7	1	9	0	1	8	0	0	0	0	2	39
23:00	2	14	2	1	3	4	0	0	10	0	0	0	0	3	39
Total	28	1335	613	148	283	170	0	72	489	4	2	4	2	125	3275
Percent	0.9%	40.8%	18.7%	4.5%	8.6%	5.2%	0.0%	2.2%	14.9%	0.1%	0.1%	0.1%	0.1%	3.8%	
AM Peak	04:00	05:00	05:00	05:00	06:00	08:00		10:00	11:00	10:00		00:00	10:00	08:00	05:00
Vol.	2	122	50	13	30	13		7	48	1		1	1	16	212
PM Peak	12:00	15:00	15:00	13:00	12:00	15:00		15:00	13:00	13:00	14:00	20:00	14:00	21:00	15:00
Vol.	4	149	62	10	30	16		13	40	2	1	2	1	10	311

USA PARKWAY
0.35 Miles South of Waltham Way

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/09/08	0	16	11	4	1	3	0	0	4	0	0	0	0	2	41
01:00	1	28	7	2	3	1	0	0	10	0	0	0	0	3	55
02:00	1	32	11	2	2	2	0	0	12	0	0	0	1	2	65
03:00	0	71	19	0	7	1	0	1	8	0	0	0	1	3	111
04:00	0	104	39	3	6	2	0	0	4	0	0	0	0	3	161
05:00	0	123	56	5	8	1	0	0	7	1	0	0	0	7	208
06:00	1	85	49	10	29	3	0	1	15	0	0	0	0	4	197
07:00	0	78	26	11	19	5	0	6	18	0	0	0	0	14	177
08:00	0	25	29	14	26	4	0	7	26	1	0	0	0	16	148
09:00	0	48	35	4	22	6	0	7	21	0	0	0	0	13	156
10:00	0	31	18	7	27	19	0	7	29	0	0	0	0	7	145
11:00	3	60	35	6	29	11	0	4	41	0	0	0	0	2	191
12 PM	2	77	48	7	32	9	0	8	39	0	0	0	0	1	223
13:00	1	96	31	10	22	7	0	6	56	0	0	0	0	4	233
14:00	0	118	58	11	25	5	0	10	27	0	0	0	0	6	260
15:00	0	123	69	17	38	6	0	16	29	0	0	0	0	15	313
16:00	0	125	58	5	18	5	0	11	26	0	0	0	1	9	258
17:00	0	84	39	4	14	1	0	6	13	0	0	0	0	13	174
18:00	1	20	11	8	8	6	0	4	20	0	0	0	0	13	91
19:00	0	21	10	0	9	3	0	10	11	0	0	0	0	16	80
20:00	0	7	3	1	7	3	0	0	6	0	0	0	0	6	33
21:00	1	9	4	4	4	3	0	1	10	0	0	0	0	3	39
22:00	0	13	2	0	2	1	0	0	9	0	0	0	0	4	31
23:00	0	13	2	1	0	3	0	1	7	0	0	0	0	2	29
Total	11	1407	670	136	358	110	0	106	448	2	0	0	3	168	3419
Percent	0.3%	41.2%	19.6%	4.0%	10.5%	3.2%	0.0%	3.1%	13.1%	0.1%	0.0%	0.0%	0.1%	4.9%	
AM Peak	11:00	05:00	05:00	08:00	06:00	10:00		08:00	11:00	05:00			02:00	08:00	05:00
Vol.	3	123	56	14	29	19		7	41	1			1	16	208
PM Peak	12:00	16:00	15:00	15:00	15:00	12:00		15:00	13:00				16:00	19:00	15:00
Vol.	2	125	69	17	38	9		16	56				1	16	313

USA PARKWAY
0.35 Miles South of Waltham Way

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/10/08	0	30	12	1	1	3	0	1	9	0	0	0	0	2	59
01:00	0	23	6	3	7	2	0	2	10	0	0	0	0	6	59
02:00	1	47	15	6	4	1	0	2	5	0	0	0	0	4	85
03:00	0	99	19	3	8	0	0	1	5	0	0	0	0	6	141
04:00	1	82	31	3	4	0	0	1	5	0	0	0	0	3	130
05:00	0	132	51	4	11	4	0	2	17	2	0	0	0	7	230
06:00	0	64	47	3	25	4	0	2	15	0	0	0	0	4	164
07:00	1	83	30	1	32	7	0	5	12	0	0	0	0	20	191
08:00	0	34	25	10	25	8	0	20	12	0	0	0	0	25	159
09:00	1	32	31	9	26	10	0	11	27	0	0	0	0	12	159
10:00	0	42	26	10	16	26	0	12	29	0	0	0	0	6	167
11:00	0	50	28	10	21	12	0	12	36	1	0	0	1	16	187
12 PM	0	67	50	9	24	5	0	5	41	1	0	0	0	1	203
13:00	0	92	54	5	18	6	0	7	39	0	1	0	0	3	225
14:00	1	126	46	7	23	13	0	9	28	0	1	0	0	5	259
15:00	2	150	63	11	36	12	0	10	33	0	0	0	0	9	326
16:00	1	121	58	4	18	4	1	12	27	0	0	0	0	15	261
17:00	0	92	35	5	12	6	0	5	12	0	0	0	0	11	178
18:00	0	22	8	9	10	4	0	0	13	0	0	0	0	10	76
19:00	1	19	5	1	12	2	0	2	15	2	0	0	0	11	70
20:00	3	8	1	7	4	1	0	0	15	0	0	0	0	7	46
21:00	0	12	6	3	10	1	0	1	15	0	0	0	0	17	65
22:00	1	10	3	1	6	5	0	1	11	0	0	0	0	8	46
23:00	0	11	5	2	4	5	0	2	7	0	0	0	0	8	44
Total	13	1448	655	127	357	141	1	125	438	6	2	0	1	216	3530
Percent	0.4%	41.0%	18.6%	3.6%	10.1%	4.0%	0.0%	3.5%	12.4%	0.2%	0.1%	0.0%	0.0%	6.1%	
AM Peak	02:00	05:00	05:00	08:00	07:00	10:00		08:00	11:00	05:00			11:00	08:00	05:00
Vol.	1	132	51	10	32	26		20	36	2			1	25	230
PM Peak	20:00	15:00	15:00	15:00	15:00	14:00	16:00	16:00	12:00	19:00	13:00			21:00	15:00
Vol.	3	150	63	11	36	13	1	12	41	2	1			17	326

USA PARKWAY
0.35 Miles South of Waltham Way

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

NB1, NB2, SB1, SB2

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/11/08	0	38	11	3	6	1	0	0	10	0	0	0	0	5	74
01:00	0	24	10	3	5	4	0	1	7	0	0	0	0	7	61
02:00	1	54	11	1	5	2	0	2	4	0	0	0	0	6	86
03:00	0	101	22	4	10	0	0	2	11	0	0	0	0	5	155
04:00	1	81	24	2	5	3	0	2	4	0	0	0	0	4	126
05:00	0	112	46	5	17	2	0	2	8	0	0	0	0	9	201
06:00	1	75	45	6	26	2	0	2	8	0	0	0	1	19	185
07:00	0	91	27	5	23	2	0	9	17	0	0	0	0	27	201
08:00	0	43	19	7	34	12	0	7	14	0	0	0	0	26	162
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	3	619	215	36	131	28	0	27	83	0	0	0	1	108	1251
Percent	0.2%	49.5%	17.2%	2.9%	10.5%	2.2%	0.0%	2.2%	6.6%	0.0%	0.0%	0.0%	0.1%	8.6%	
AM Peak	02:00	05:00	05:00	08:00	08:00	08:00		07:00	07:00				06:00	07:00	05:00
Vol.	1	112	46	7	34	12		9	17				1	27	201
PM Peak															
Vol.															
Grand Total	109	8681	3602	851	1636	905	3	429	3191	26	4	6	44	819	20306
Percent	0.5%	42.8%	17.7%	4.2%	8.1%	4.5%	0.0%	2.1%	15.7%	0.1%	0.0%	0.0%	0.2%	4.0%	

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

WALTHAM WAY
0.10 Mile South of I-80 Partick Int

Site Code:
Station ID:

Latitude: 0' 0.000 Undefined

EB1, WB1

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/04/08	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	1	97	35	5	27	4	0	3	5	1	0	0	1	6	185
15:00	1	133	64	7	27	1	0	2	8	2	0	0	0	1	246
16:00	1	141	32	2	25	3	0	0	10	0	0	0	0	2	216
17:00	0	137	24	3	13	1	0	4	6	0	0	0	0	1	189
18:00	4	49	11	1	1	1	0	1	1	0	0	0	0	0	69
19:00	0	34	7	2	1	0	0	0	3	0	0	0	0	0	47
20:00	0	20	5	0	0	1	0	0	1	0	0	0	0	0	27
21:00	1	26	7	2	1	1	0	0	0	0	0	0	0	0	38
22:00	0	28	8	0	3	1	0	0	5	0	2	0	0	0	47
23:00	1	29	10	2	2	1	0	0	0	0	0	0	0	0	45
Total	9	694	203	24	100	14	0	10	39	3	2	0	1	10	1109
Percent	0.8%	62.6%	18.3%	2.2%	9.0%	1.3%	0.0%	0.9%	3.5%	0.3%	0.2%	0.0%	0.1%	0.9%	
AM Peak Vol.															
PM Peak Vol.	18:00 4	16:00 141	15:00 64	15:00 7	14:00 27	14:00 4		17:00 4	16:00 10	15:00 2	22:00 2		14:00 1	14:00 6	15:00 246

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

WALTHAM WAY
0.10 Mile South of I-80 Partick Int

Site Code:
Station ID:

EB1, WB1

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/05/08	0	14	4	1	2	0	0	0	0	0	0	0	0	0	21
01:00	0	6	5	0	0	0	0	0	0	0	0	0	0	0	11
02:00	1	11	2	1	1	0	0	0	0	0	0	0	0	0	16
03:00	0	10	3	0	2	1	0	0	2	0	0	0	0	0	18
04:00	0	12	6	0	1	1	0	0	2	0	0	0	0	0	22
05:00	0	78	20	0	6	0	0	1	1	0	0	0	0	0	106
06:00	2	167	45	1	10	3	0	1	5	0	0	0	0	1	235
07:00	1	153	35	3	18	5	0	1	6	0	0	0	0	1	223
08:00	1	68	22	5	15	3	0	5	11	1	1	0	0	2	134
09:00	0	42	23	1	10	5	0	2	16	1	1	0	1	0	102
10:00	2	51	33	4	16	6	0	3	17	3	0	0	1	4	140
11:00	3	48	25	7	11	6	0	3	16	0	0	0	0	5	124
12 PM	1	78	23	5	10	3	1	3	13	0	0	0	2	3	142
13:00	1	90	30	3	19	3	0	4	10	1	0	0	0	3	164
14:00	1	100	43	1	24	6	0	9	13	1	0	0	1	1	200
15:00	3	141	60	4	21	2	0	3	6	1	0	0	0	4	245
16:00	1	76	23	1	18	1	0	0	7	0	1	0	0	0	128
17:00	0	129	22	0	7	1	0	2	10	0	0	0	0	3	174
18:00	0	61	16	1	7	0	0	2	4	0	0	0	0	1	92
19:00	0	61	19	0	1	0	0	1	6	0	0	0	0	0	88
20:00	1	22	2	2	1	1	0	0	2	0	0	0	0	0	31
21:00	0	31	7	0	4	1	0	0	0	0	0	0	0	1	44
22:00	0	34	14	0	2	0	0	0	1	0	0	0	1	2	54
23:00	0	29	4	0	4	0	0	0	0	0	0	0	0	0	37
Total	18	1512	486	40	210	48	1	40	148	8	3	0	6	31	2551
Percent	0.7%	59.3%	19.1%	1.6%	8.2%	1.9%	0.0%	1.6%	5.8%	0.3%	0.1%	0.0%	0.2%	1.2%	
AM Peak	11:00	06:00	06:00	11:00	07:00	10:00		08:00	10:00	10:00	08:00		09:00	11:00	06:00
Vol.	3	167	45	7	18	6		5	17	3	1		1	5	235
PM Peak	15:00	15:00	15:00	12:00	14:00	14:00	12:00	14:00	12:00	13:00	16:00		12:00	15:00	15:00
Vol.	3	141	60	5	24	6	1	9	13	1	1		2	4	245

WALTHAM WAY
0.10 Mile South of I-80 Partick Int

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

EB1, WB1

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/06/08	0	32	5	0	2	0	0	0	2	0	0	0	0	0	41
01:00	0	15	4	0	0	0	0	0	0	0	0	0	0	0	19
02:00	1	13	6	1	4	0	0	0	0	0	0	0	0	0	25
03:00	0	13	5	0	0	0	0	0	0	0	0	0	0	0	18
04:00	1	11	4	0	2	1	0	1	1	0	0	0	0	0	21
05:00	1	61	13	0	1	0	0	0	3	0	0	0	0	0	79
06:00	2	75	16	1	3	3	0	1	2	0	0	0	0	2	105
07:00	1	65	13	1	3	0	0	0	1	0	0	0	0	0	84
08:00	0	27	12	2	2	0	0	1	3	0	0	0	0	1	48
09:00	0	9	3	1	6	0	0	0	3	0	0	0	0	0	22
10:00	0	20	10	0	3	6	0	0	7	0	0	0	0	0	46
11:00	0	39	11	2	4	0	0	1	8	0	0	0	0	2	67
12 PM	0	39	11	0	0	1	0	1	4	0	0	0	0	0	56
13:00	0	58	22	0	8	1	0	1	3	0	0	0	0	0	93
14:00	2	44	26	0	7	0	0	0	3	0	0	0	0	0	82
15:00	2	56	22	0	8	2	0	1	2	0	0	0	0	0	93
16:00	0	33	18	0	3	1	0	1	0	0	0	0	0	0	56
17:00	0	27	7	0	0	0	0	0	2	0	0	0	0	0	36
18:00	1	31	14	1	2	3	0	0	4	0	0	0	0	0	56
19:00	0	24	3	0	0	0	0	0	3	0	0	0	0	1	31
20:00	1	19	7	0	0	3	0	0	1	0	0	0	0	1	32
21:00	0	23	6	0	1	0	0	0	3	0	0	0	0	0	33
22:00	3	34	15	0	1	1	0	0	3	0	0	0	0	2	59
23:00	0	34	15	0	6	0	0	0	1	0	0	0	0	1	57
Total	15	802	268	9	66	22	0	8	59	0	0	0	0	10	1259
Percent	1.2%	63.7%	21.3%	0.7%	5.2%	1.7%	0.0%	0.6%	4.7%	0.0%	0.0%	0.0%	0.0%	0.8%	
AM Peak	06:00	06:00	06:00	08:00	09:00	10:00		04:00	11:00					06:00	06:00
Vol.	2	75	16	2	6	6		1	8					2	105
PM Peak	22:00	13:00	14:00	18:00	13:00	18:00		12:00	12:00					22:00	13:00
Vol.	3	58	26	1	8	3		1	4					2	93

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

WALTHAM WAY
0.10 Mile South of I-80 Partick Int

Site Code:
Station ID:

EB1, WB1

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/07/08	0	19	3	0	2	0	0	0	0	0	0	0	0	0	24
01:00	0	9	3	0	3	0	0	0	0	0	0	0	0	1	16
02:00	1	24	6	0	2	0	0	0	0	0	0	0	0	0	33
03:00	0	10	2	0	0	0	0	0	0	0	0	0	0	1	13
04:00	0	13	5	0	0	0	0	0	0	0	0	0	0	0	18
05:00	1	33	9	0	2	0	0	0	0	0	0	1	0	0	46
06:00	4	64	12	0	3	1	0	1	2	0	0	1	0	0	88
07:00	1	41	9	2	4	1	0	0	0	0	0	0	0	0	58
08:00	0	13	3	2	2	3	0	1	2	0	0	0	0	2	28
09:00	0	10	2	1	5	2	0	0	4	0	0	1	0	1	26
10:00	0	9	4	1	1	0	0	0	2	0	0	0	0	0	17
11:00	1	22	7	2	0	1	0	0	1	0	0	0	0	3	37
12 PM	2	20	5	1	2	2	0	0	5	0	0	0	0	1	38
13:00	2	37	7	2	0	2	0	0	2	0	0	0	0	0	52
14:00	1	27	18	0	3	0	0	1	3	1	0	0	0	1	55
15:00	0	33	10	1	2	0	0	0	2	0	0	0	0	0	48
16:00	0	33	6	0	0	1	0	0	2	1	0	0	0	0	43
17:00	4	45	11	1	2	2	0	0	4	1	0	0	0	4	74
18:00	0	32	10	0	4	0	0	0	0	0	0	0	0	0	46
19:00	1	18	7	2	2	2	1	0	3	1	0	1	0	2	40
20:00	0	21	5	0	2	1	0	0	3	0	0	1	0	0	33
21:00	0	7	7	0	3	0	0	0	0	0	0	0	0	0	17
22:00	0	6	1	0	0	0	0	1	2	0	0	0	1	0	11
23:00	0	9	5	0	1	0	0	0	1	0	0	0	0	0	16
Total	18	555	157	15	45	18	1	4	38	4	0	5	1	16	877
Percent	2.1%	63.3%	17.9%	1.7%	5.1%	2.1%	0.1%	0.5%	4.3%	0.5%	0.0%	0.6%	0.1%	1.8%	
AM Peak	06:00	06:00	06:00	07:00	09:00	08:00		06:00	09:00			05:00		11:00	06:00
Vol.	4	64	12	2	5	3		1	4			1		3	88
PM Peak	17:00	17:00	14:00	13:00	18:00	12:00	19:00	14:00	12:00	14:00		19:00	22:00	17:00	17:00
Vol.	4	45	18	2	4	2	1	1	5	1		1	1	4	74

WALTHAM WAY
0.10 Mile South of I-80 Partick Int

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

Site Code:
Station ID:

EB1, WB1

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/08/08	0	12	2	0	2	1	0	0	0	0	0	0	0	0	17
01:00	0	9	1	1	1	0	0	0	3	0	0	0	0	0	15
02:00	0	3	2	3	0	1	0	0	0	0	0	0	0	0	9
03:00	0	7	6	0	1	2	0	0	0	0	0	0	0	0	16
04:00	0	20	7	0	0	1	0	0	2	0	0	0	0	0	30
05:00	2	81	18	1	5	1	0	0	6	0	0	0	0	0	114
06:00	3	190	46	1	11	2	0	0	8	0	0	0	0	3	264
07:00	3	129	26	4	16	4	0	4	4	1	0	0	0	2	193
08:00	4	67	18	6	23	1	0	4	21	1	0	0	0	6	151
09:00	1	39	21	10	13	6	0	3	15	1	0	0	1	1	111
10:00	0	55	21	8	17	9	2	4	16	0	0	0	0	4	136
11:00	0	51	28	8	15	4	2	5	22	0	0	0	1	3	139
12 PM	1	60	17	8	20	4	0	4	9	1	0	0	0	5	129
13:00	1	74	22	8	14	5	0	2	12	1	0	0	0	6	145
14:00	2	62	29	6	21	7	0	7	12	0	0	0	0	1	147
15:00	5	122	54	2	22	7	0	2	7	0	0	0	0	4	225
16:00	0	101	28	3	26	2	0	3	6	0	0	0	0	4	173
17:00	1	147	33	0	13	2	0	1	5	0	1	0	0	3	206
18:00	1	92	23	3	4	4	0	1	4	0	2	0	0	1	135
19:00	0	35	8	2	2	2	0	4	5	0	0	0	0	3	61
20:00	1	18	4	2	1	1	0	1	0	0	0	0	0	1	29
21:00	0	29	7	0	1	0	0	0	0	0	0	0	0	1	38
22:00	0	34	6	1	3	0	0	0	1	0	0	0	0	0	45
23:00	0	21	6	0	1	0	0	0	2	0	0	0	0	0	30
Total	25	1458	433	77	232	66	4	45	160	5	3	0	2	48	2558
Percent	1.0%	57.0%	16.9%	3.0%	9.1%	2.6%	0.2%	1.8%	6.3%	0.2%	0.1%	0.0%	0.1%	1.9%	
AM Peak	08:00	06:00	06:00	09:00	08:00	10:00	10:00	11:00	11:00	07:00			09:00	08:00	06:00
Vol.	4	190	46	10	23	9	2	5	22	1			1	6	264
PM Peak	15:00	17:00	15:00	12:00	16:00	14:00		14:00	13:00	12:00	18:00			13:00	15:00
Vol.	5	147	54	8	26	7		7	12	1	2			6	225

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

WALTHAM WAY
0.10 Mile South of I-80 Partick Int

Site Code:
Station ID:

EB1, WB1

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/09/08	0	11	4	0	1	0	0	1	1	0	0	0	0	1	19
01:00	1	10	3	0	1	1	0	1	2	0	0	0	0	0	19
02:00	0	18	7	1	6	1	0	1	0	0	0	0	0	2	36
03:00	1	25	4	1	2	4	0	4	2	0	0	0	0	3	46
04:00	0	24	7	1	0	4	0	5	1	0	0	0	0	2	44
05:00	2	88	17	0	9	5	0	5	3	0	0	0	0	3	132
06:00	2	143	47	3	8	1	0	3	4	0	0	0	0	6	217
07:00	1	161	35	1	20	3	0	3	1	1	0	0	0	0	226
08:00	0	62	28	2	23	3	0	5	10	2	0	0	0	5	140
09:00	1	28	34	4	13	5	0	6	17	2	0	1	0	1	112
10:00	3	53	18	11	20	7	0	4	14	0	0	0	2	6	138
11:00	5	54	22	6	26	7	0	5	11	0	0	0	1	3	140
12 PM	0	39	18	4	13	1	0	4	9	1	0	0	1	1	91
13:00	6	56	25	4	18	1	1	8	11	1	0	0	0	6	137
14:00	0	78	25	1	13	2	1	5	8	1	0	0	0	1	135
15:00	1	150	59	3	21	2	0	2	13	0	0	0	0	2	253
16:00	2	137	29	1	31	1	0	7	13	0	0	0	0	5	226
17:00	2	140	33	5	13	2	0	1	7	0	0	0	0	8	211
18:00	0	46	17	1	2	0	0	1	2	1	0	0	0	1	71
19:00	1	21	7	1	1	1	0	2	4	0	0	0	0	1	39
20:00	1	15	2	1	3	1	0	2	0	0	0	0	0	0	25
21:00	0	24	7	1	3	0	0	0	1	0	0	0	0	0	36
22:00	0	27	3	0	2	1	0	1	0	0	0	0	0	2	36
23:00	0	30	10	0	3	0	0	0	2	0	0	0	0	1	46
Total	29	1440	461	52	252	53	2	76	136	9	0	1	4	60	2575
Percent	1.1%	55.9%	17.9%	2.0%	9.8%	2.1%	0.1%	3.0%	5.3%	0.3%	0.0%	0.0%	0.2%	2.3%	
AM Peak	11:00	07:00	06:00	10:00	11:00	10:00		09:00	09:00	08:00		09:00	10:00	06:00	07:00
Vol.	5	161	47	11	26	7		6	17	2		1	2	6	226
PM Peak	13:00	15:00	15:00	17:00	16:00	14:00	13:00	13:00	15:00	12:00			12:00	17:00	15:00
Vol.	6	150	59	5	31	2	1	8	13	1			1	8	253

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

WALTHAM WAY
0.10 Mile South of I-80 Partick Int

Site Code:
Station ID:

EB1, WB1

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/10/08	0	8	5	0	1	0	0	0	1	0	0	0	0	0	15
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	8	1	1	0	0	0	0	1	0	0	0	0	0	11
03:00	0	7	3	0	0	1	0	1	1	0	0	0	0	1	14
04:00	0	13	5	0	1	1	0	0	3	0	0	0	0	0	23
05:00	1	74	23	2	4	1	0	3	1	0	0	0	0	1	110
06:00	0	163	47	2	12	1	0	7	5	0	0	0	0	2	239
07:00	2	160	39	2	14	6	0	2	9	0	0	1	0	6	241
08:00	2	65	24	4	12	4	0	5	13	1	0	0	0	7	137
09:00	1	82	19	12	10	1	0	4	12	3	0	0	0	3	147
10:00	1	55	20	9	22	2	0	4	6	0	0	1	0	2	122
11:00	1	56	17	4	16	3	1	4	10	0	0	0	0	6	118
12 PM	0	40	18	5	6	3	0	2	13	0	1	0	0	4	92
13:00	1	72	22	1	13	1	0	7	8	0	1	0	1	0	127
14:00	0	73	32	4	20	2	0	3	8	0	0	0	0	2	144
15:00	0	157	57	8	23	2	0	7	8	0	0	0	1	5	268
16:00	5	111	44	2	17	4	0	3	5	0	0	0	0	2	193
17:00	2	190	40	0	14	2	0	2	4	0	0	0	0	9	263
18:00	0	71	28	1	6	1	0	5	1	0	0	0	0	2	115
19:00	2	38	10	0	2	0	0	0	1	0	0	0	0	0	53
20:00	0	24	7	0	2	1	0	1	0	0	0	0	0	1	36
21:00	0	26	5	2	6	1	0	0	0	0	0	0	0	1	41
22:00	0	24	8	0	0	0	0	1	1	0	0	0	0	1	35
23:00	0	19	5	0	3	1	0	0	3	0	0	0	0	0	31
Total	18	1540	479	59	204	38	1	61	114	4	2	2	2	55	2579
Percent	0.7%	59.7%	18.6%	2.3%	7.9%	1.5%	0.0%	2.4%	4.4%	0.2%	0.1%	0.1%	0.1%	2.1%	
AM Peak	07:00	06:00	06:00	09:00	10:00	07:00	11:00	06:00	08:00	09:00		07:00		08:00	07:00
Vol.	2	163	47	12	22	6	1	7	13	3		1		7	241
PM Peak	16:00	17:00	15:00	15:00	15:00	16:00		13:00	12:00		12:00		13:00	17:00	15:00
Vol.	5	190	57	8	23	4		7	13		1		1	9	268

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

WALTHAM WAY
0.10 Mile South of I-80 Partick Int

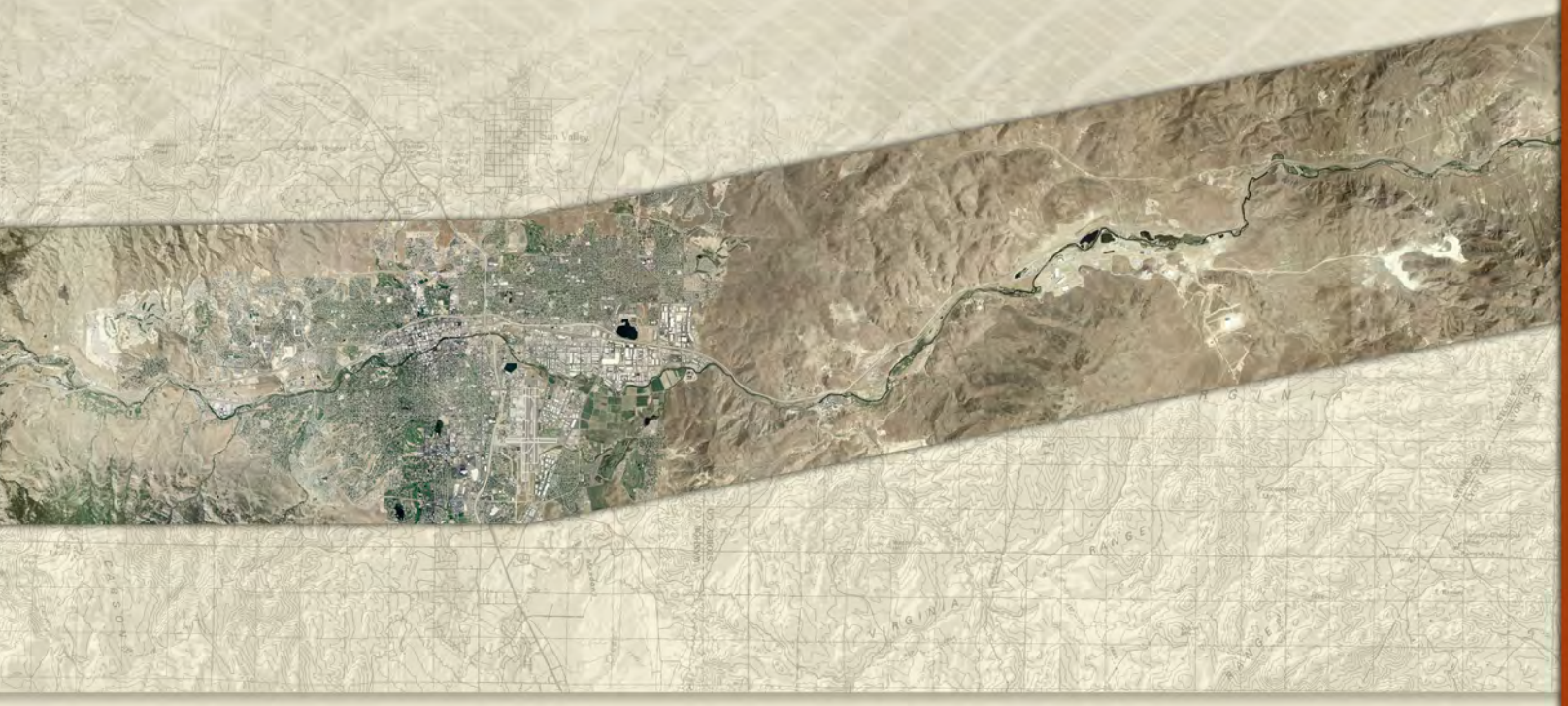
Site Code:
Station ID:

EB1, WB1

Latitude: 0' 0.000 Undefined

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12/11/08	0	15	2	0	0	0	0	2	0	0	0	0	0	1	20
01:00	0	12	1	0	1	0	0	0	2	0	0	0	0	1	17
02:00	0	10	2	0	0	0	0	0	1	0	0	0	0	0	13
03:00	1	6	3	0	0	2	0	0	2	0	0	0	0	0	14
04:00	1	15	8	0	0	1	0	0	1	0	0	0	0	1	27
05:00	1	83	19	1	6	1	0	1	3	0	0	0	0	2	117
06:00	3	162	46	0	14	4	0	2	7	0	0	0	0	3	241
07:00	2	159	30	3	13	1	0	6	7	0	1	0	0	4	226
08:00	0	65	26	4	9	1	0	5	7	0	0	0	0	1	118
09:00	3	39	24	4	19	1	1	3	13	0	0	0	2	8	117
10:00	1	32	21	8	12	1	0	6	10	1	0	1	1	7	101
11:00	0	48	18	5	16	6	0	4	12	1	2	1	0	2	115
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	12	646	200	25	90	18	1	29	65	2	3	2	3	30	1126
Percent	1.1%	57.4%	17.8%	2.2%	8.0%	1.6%	0.1%	2.6%	5.8%	0.2%	0.3%	0.2%	0.3%	2.7%	
AM Peak	06:00	06:00	06:00	10:00	09:00	11:00	09:00	07:00	09:00	10:00	11:00	10:00	09:00	09:00	06:00
Vol.	3	162	46	8	19	6	1	6	13	1	2	1	2	8	241
PM Peak															
Vol.															
Grand Total	144	8647	2687	301	1199	277	10	273	759	35	13	10	19	260	14634
Percent	1.0%	59.1%	18.4%	2.1%	8.2%	1.9%	0.1%	1.9%	5.2%	0.2%	0.1%	0.1%	0.1%	1.8%	

PROVIDED ELECTRONICALLY ON ENCLOSED CD



APPENDIX 6-B

Table 1: Future 2 Year Average Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Existing Mainline Lanes	Existing Ramp Lanes	LCA AADT			K	DDHV			2 Year Balanced Peak Hour Volume		
								Off-Ramp	On-Ramp	Total Mainline		Off-Ramp	On-Ramp	Mainline	Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4022	2011	10%	2640	2	1	720		21930	0.105	76		2303	62		2303
2	West Verdi Off	4022	2011	10%	2100	2					0.105						2241
3	West Verdi On	4022	2011	10%	1740	2	1		9030	30240	0.09		813	2722		373	2614
4	West Verdi On Cont.	4022	2011	10%	2960	2					0.09						2614
5	Verdi On	4022	2011	10%	5100	2	1	2920	2980	33160	0.09	263	268	2984	158	200	2814
6	Garson Off	4022	2011	10%	2920	2					0.09						2656
7	Garson On	4022	2011	10%	4350	2	1		8040		0.09		724	0		573	3229
8	East Verdi On Acceleration	6033	2011	10%	680	3	1		4480	42700	0.09		403	3843		295	3524
9	East Verdi On	4022	2011	10%	880	2	1	3430			0.09	309	0	0	176	0	3524
10	Mogul Off	4022	2011	10%	1740	2					0.09						3348
11	Mogul On Acceleration	6033	2011	10%	450	3	1		2840	42100	0.09		256	3789		137	3485
12	Mogul On	4022	2011	10%	1600	2	1	4440			0.09	400	0	0	188	0	3485
13	West 4th Off	4022	2011	10%	6980	2	1	4940			0.09	445	0	0	354	0	3297
14	Robb Drive Off	4356	2178	5%	1500	2					0.08						2943
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2		15900	48630	0.08		1272	3890		1086	4029
16	Rob Drive On Cont	6534	2178	5%	1200	3	1	12100			0.08	968	0	0	786	0	4029
17	West McCarran Off	4356	2178	5%	4470	2					0.08						3242
18	West McCarran On	4356	2178	5%	2640	2	1		13460	50000	0.08		1077	4000		981	4223

Table 2: Future 2 Year Average Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Existing Mainline Lanes	Existing Ramp Lanes	LCA AADT			K	DDHV			2 Year Balanced Peak Hour Volume		
								Off-Ramp	On-Ramp	Total Mainline		Off-Ramp	On-Ramp	Mainline	Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	8712	2178	5%	2500	4	2	14480		48429	0.08	1158		3874	1065		3874
2	West McCarran Off	6534	2178	5%	4490	3				0	0.08						2809
3	West McCarran On	6534	2178	5%	4300	3	1	16290	12980	46939	0.08	1303	1038	3755	1116	766	3575
4	Robb Drive Off	6534	2178	5%	3300	3					0.08						2459
5	Robb Drive On, Acceleration	6180	2060	5%	430	3	1		5860	34730	0.08		469	2778		368	2827
6	Robb Drive On cont	4120	2060	5%	7200	2					0.09						2827
7	West 4th Street On, Acceleration	6180	2060	5%	440	3	1		970		0.09		87			38	2865
8	West 4th Street On cont	4120	2060	5%	890	2	1	4380		40409	0.09	394		3637	182		2865
9	Exit 7, Mogul Off Ramp	4120	2060	5%	700	2					0.09						2683
10	Mogul On, Acceleration	6180	2060	5%	160	3	1		3390	41039	0.09		305	3694		177	2860
11	Mogul On cont	4120	2060	5%	6840	2	1	3140		39260	0.09	283		3533	283		2860
12	Exit 5, East Verdi Off Ramp	4120	2060	5%	5350	2	1	9100			0.09	819			651		2577
13	Exit 4, Garson Off Ramp	4120	2060	5%	1480	2					0.09						1926
14	Garson On, Acceleration	5895	1965	15%	765	3	1		4130		0.09		372			287	2213
15	Garson On cont	3930	1965	15%	4100	2	1	2630		31769	0.09	237		2859	143		2213
16	Exit 3, Verdi Off Ramp	3930	1965	15%	5430	2	1	2980		29149	0.09	268		2623	190		2070
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1	0			0.09	0			0		1880
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2					0.105						1880
19	West Verdi On Ramp	3930	1965	15%	2500	2	1		2570	19539	0.105		270	2052		166	2046

Table 3: Future 7 Year Average Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	4022	2011	10%	2640	2	1	890		16760	0.105	93		1760
2	West Verdi Off	4022	2011	10%	2100	2				15880	0.105			1667
3	West Verdi On	4022	2011	10%	1740	2	1		5630	21510	0.09		507	1936
4	West Verdi On Cont.	4022	2011	10%	2960	2				21510	0.09			1936
5	Verdi On	4022	2011	10%	5100	2	1	1960	1740	23250	0.09	176	157	2093
6	Garson Off	4022	2011	10%	2920	2				21290	0.09			1916
7	Garson On	4022	2011	10%	4350	2	1		4430	25720	0.09		399	2315
8	East Verdi On Acceleration	6033	2011	10%	680	3	1		3510	29230	0.09		316	2631
9	East Verdi On	4022	2011	10%	880	2	1	2790		29230	0.09	251	0	2631
10	Mogul Off	4022	2011	10%	1740	2				26440	0.09			2380
11	Mogul On Acceleration	6033	2011	10%	450	3	1		2220	28660	0.09		200	2579
12	Mogul On	4022	2011	10%	1600	2	1	2820		28660	0.09	254	0	2579
13	West 4th Off	4022	2011	10%	6980	2	1	3680		25840	0.09	331	0	2326
14	Robb Drive Off	4356	2178	5%	1500	2				22150	0.08			1772
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2		13850	36000	0.08		1108	2880
16	Rob Drive On Cont	6534	2178	5%	1200	3	1	8860		36000	0.08	709	0	2880
17	West McCarran Off	4356	2178	5%	4470	2				27140	0.08			2171
18	West McCarran On	4356	2178	5%	2640	2	1		13170	40310	0.08		1054	3225

Table 4: Future 7 Year Average Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	8712	2178	5%	2500	4	2	14010		40540	0.08	1121		3243
2	West McCarran Off	6534	2178	5%	4490	3				26530	0.08			2122
3	West McCarran On	6534	2178	5%	4300	3	1	14030	9490	36020	0.08	1122	759	2882
4	Robb Drive Off	6534	2178	5%	3300	3				21990	0.08			1759
5	Robb Drive On, Acceleration	6180	2060	5%	430	3	1		4280	26280	0.08		342	2102
6	Robb Drive On cont	4120	2060	5%	7200	2				26280	0.09			2365
7	West 4th Street On, Acceleration	6180	2060	5%	440	3	1		2500	28780	0.09		225	2590
8	West 4th Street On cont	4120	2060	5%	890	2	1	3180		28780	0.09	286		2590
9	Exit 7, Mogul Off Ramp	4120	2060	5%	700	2				26750	0.09			2408
10	Mogul On, Acceleration	6180	2060	5%	160	3	1		2760	29500	0.09		248	2655
11	Mogul On cont	4120	2060	5%	6840	2	1	3370		29500	0.09	303		2655
12	Exit 5, East Verdi Off Ramp	4120	2060	5%	5350	2	1	5100		26130	0.09	459		2352
13	Exit 4, Garson Off Ramp	4120	2060	5%	1480	2				21030	0.09			1893
14	Garson On, Acceleration	5895	1965	15%	765	3	1		2680	23710	0.09		241	2134
15	Garson On cont	3930	1965	15%	4100	2	1	1570		23710	0.09	141		2134
16	Exit 3, Verdi Off Ramp	3930	1965	15%	5430	2	1	7850		22140	0.09	707		1993
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1	0		14290	0.09	0		1286
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2				14290	0.105			1500
19	West Verdi On Ramp	3930	1965	15%	2500	2	1		2200	16490	0.105		231	1731

Table 5: Future 15 Years Average Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	4022	2011	10%	2640	2	1	730		18230	0.105	77		1914
2	West Verdi Off	4022	2011	10%	2100	2				17500	0.105			1838
3	West Verdi On	4022	2011	10%	1740	2	1		8610	26110	0.09		775	2350
4	West Verdi On Cont.	4022	2011	10%	2960	2				26110	0.09			2350
5	Verdi On	4022	2011	10%	5100	2	1	2950	2830	28940	0.09	266	255	2605
6	Garson Off	4022	2011	10%	2920	2				25980	0.09			2338
7	Garson On	4022	2011	10%	4350	2	1		8280	34270	0.09		745	3084
8	East Verdi On Acceleration	6033	2011	10%	680	3	1		4480	38740	0.09		403	3487
9	East Verdi On	4022	2011	10%	880	2	1	3370		38740	0.09	303	0	3487
10	Mogul Off	4022	2011	10%	1740	2				35370	0.09			3183
11	Mogul On Acceleration	6033	2011	10%	450	3	1		3010	38390	0.09		271	3455
12	Mogul On	4022	2011	10%	1600	2	1	4270		38390	0.09	384	0	3455
13	West 4th Off	4022	2011	10%	6980	2	1	4490		34120	0.09	404	0	3071
14	Robb Drive Off	4356	2178	5%	1500	2				29630	0.08			2370
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2		16090	45720	0.08		1287	3658
16	Rob Drive On Cont	6534	2178	5%	1200	3	1	11600		45720	0.08	928	0	3658
17	West McCarran Off	4356	2178	5%	4470	2				34120	0.08			2730
18	West McCarran On	4356	2178	5%	2640	2	1		15100	49220	0.08		1208	3938

Table 6: Future 15 Year Average Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	8712	2178	5%	2500	4	2	16150		49650	0.08	1292		3972
2	West McCarran Off	6534	2178	5%	4490	3				33500	0.08			2680
3	West McCarran On	6534	2178	5%	4300	3	1	16420	12480	45980	0.08	1314	998	3678
4	Robb Drive Off	6534	2178	5%	3300	3				29570	0.08			2366
5	Robb Drive On, Acceleration	6180	2060	5%	430	3	1		5340	34900	0.08		427	2792
6	Robb Drive On cont	4120	2060	5%	7200	2				34900	0.09			3141
7	West 4th Street On, Acceleration	6180	2060	5%	440	3	1		3810	38720	0.09		343	3485
8	West 4th Street On cont	4120	2060	5%	890	2	1	4520		38720	0.09	407		3485
9	Exit 7, Mogul Off Ramp	4120	2060	5%	700	2				35780	0.09			3220
10	Mogul On, Acceleration	6180	2060	5%	160	3	1		3300	39070	0.09		297	3516
11	Mogul On cont	4120	2060	5%	6840	2	1	4290		39070	0.09	386		3516
12	Exit 5, East Verdi Off Ramp	4120	2060	5%	5350	2	1	9340		34780	0.09	841		3130
13	Exit 4, Garson Off Ramp	4120	2060	5%	1480	2				25440	0.09			2290
14	Garson On, Acceleration	5895	1965	15%	765	3	1		4090	29530	0.09		368	2658
15	Garson On cont	3930	1965	15%	4100	2	1	2550		29530	0.09	230		2658
16	Exit 3, Verdi Off Ramp	3930	1965	15%	5430	2	1	11600		26990	0.09	1044		2429
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1	0		15380	0.09	0		1384
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2				15380	0.105			1615
19	West Verdi On Ramp	3930	1965	15%	2500	2	1		2530	17910	0.105		266	1881

Table 7: Future 25 Year Average Estimate **I 80 West Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	4022	2011	10%	2640	2	1	760		19760	0.105	80		2075
2	West Verdi Off	4022	2011	10%	2100	2				19000	0.105			1995
3	West Verdi On	4022	2011	10%	1740	2	1		18800	37880	0.09		1692	3409
4	West Verdi On Cont.	4022	2011	10%	2960	2				37880	0.09			3409
5	Verdi On	4022	2011	10%	5100	2	1	3200	5330	43210	0.09	288	480	3889
6	Garson Off	4022	2011	10%	2920	2				40020	0.09			3602
7	Garson On	4022	2011	10%	4350	2	1		9200	49220	0.09		828	4430
8	East Verdi On Acceleration	6033	2011	10%	680	3	1		5620	54840	0.09		506	4936
9	East Verdi On	4022	2011	10%	880	2	1	4220		54840	0.09	380	0	4936
10	Mogul Off	4022	2011	10%	1740	2				50620	0.09			4556
11	Mogul On Acceleration	6033	2011	10%	450	3	1		3600	54220	0.09		324	4880
12	Mogul On	4022	2011	10%	1600	2	1	7040		54220	0.09	634	0	4880
13	West 4th Off	4022	2011	10%	6980	2	1	5720		47190	0.09	515	0	4247
14	Robb Drive Off	4356	2178	5%	1500	2				41470	0.08			3318
15	Robb Drive On Acceleration	8712	2178	5%	4000	4	2		17590	59070	0.08		1407	4726
16	Rob Drive On Cont	6534	2178	5%	1200	3	1	15720		59070	0.08	1258	0	4726
17	West McCarran Off	4356	2178	5%	4470	2				43340	0.08			3467
18	West McCarran On	4356	2178	5%	2640	2	1		17250	60590	0.08		1380	4847

Table 8: Future 25 Year Average Estimate **I 80 West Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	8712	2178	5%	2500	4	2	18410		61670	0.08	1473		4934
2	West McCarran Off	6534	2178	5%	4490	3				43270	0.08			3462
3	West McCarran On	6534	2178	5%	4300	3	1	18100	17300	60560	0.08	1448	1384	4845
4	Robb Drive Off	6534	2178	5%	3300	3				42470	0.08			3398
5	Robb Drive On, Acceleration	6180	2060	5%	430	3	1		7000	49470	0.08		560	3958
6	Robb Drive On cont	4120	2060	5%	7200	2				49470	0.09			4452
7	West 4th Street On, Acceleration	6180	2060	5%	440	3	1		6210	55680	0.09		559	5011
8	West 4th Street On cont	4120	2060	5%	890	2	1	3860		55680	0.09	347		5011
9	Exit 7, Mogul Off Ramp	4120	2060	5%	700	2				51820	0.09			4664
10	Mogul On, Acceleration	6180	2060	5%	160	3	1		4250	56060	0.09		383	5045
11	Mogul On cont	4120	2060	5%	6840	2	1	5340		56060	0.09	481		5045
12	Exit 5, East Verdi Off Ramp	4120	2060	5%	5350	2	1	10300		50720	0.09	927		4565
13	Exit 4, Garson Off Ramp	4120	2060	5%	1480	2				40420	0.09			3638
14	Garson On, Acceleration	5895	1965	15%	765	3	1		4500	44920	0.09		405	4043
15	Garson On cont	3930	1965	15%	4100	2	1	4750		44920	0.09	428		4043
16	Exit 3, Verdi Off Ramp	3930	1965	15%	5430	2	1	24670		40160	0.09	2220		3614
17	Exit 2, West Verdi Off	3930	1965	15%	2590	2	1	0		15490	0.09	0		1394
18	Exit 1, West Verdi Off	3930	1965	15%	1150	2				15490	0.105			1626
19	West Verdi On Ramp	3930	1965	15%	2500	2	1		3800	19290	0.105		399	2025

Table 9: Future 2 Year Average Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	4356	2178	5%	2640	2	1	11821		44414	0.086	1017		3820
2	E.McCarran Off Ramp	4356	2178	5%	2540	2				32593	0.086			2803
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1	10766	5380	37973	0.086	926	463	3266
4	Sparks Off Ramp	4356	2178	5%	2000	2				27206	0.086			2340
5	Sparks On Ramp	4356	2178	5%	1500	2	1	10429	1767	28973	0.086	897	152	2492
6	Vista Off Ramp	4356	2178	5%	2200	2				18544	0.086			1595
7	Vista On Ramp	4252	2126	10%	3600	2	1		4903	23447	0.095		466	2227
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	3147		23447	0.095	299		2227
9	Lockwood Off Ramp	4022	2011	10%	1800	2				20300	0.095			1928
10	Lockwood On Ramp	4022	2011	10%	5460	2	1	2381	395	20245	0.095	226	38	1923
11	Mustang Off Ramp	4022	2011	10%	3069	2				17865	0.095			1697
12	Mustang On Ramp	4022	2011	10%	13300	2	1		384	19707	0.095		36	1872
13	Mustang On Ramp Cont.	4022	2011	10%	5280	2				19707	0.095			1872
14	Mustang On Ramp Cont.	4022	2011	10%	4180	2	1	2774		19707	0.095	264		1872
15	Patrick Off Ramp	4022	2011	10%	2680	2				16933	0.095			1609
16	Patrick On Ramp	4022	2011	10%	8960	2	1	2749	503	17428	0.095	261	48	1656
17	USA Parkway Off Ramp	4022	2011	10%	2220	2				14679	0.093			1365
18	USA Parkway On Ramp	4022	2011	10%	10560	2			1074	14302	0.093		100	1330
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1	87		14302	0.093	8		1330
20	Derby Off Ramp	4022	2011	10%	2020	2				14215	0.093			1322
21	Derby On Ramp	4022	2011	10%	8980	2	1	39	59	15599	0.093	4	5	1451
22	Orchard Off Ramp	4022	2011	10%	1750	2				15560	0.093			1447
23	Orchard On Ramp	4022	2011	10%	4320	2	1	72	31	14030	0.093	7	3	1305
24	Painted Rock Off Ramp	4022	2011	10%	1800	2				13958	0.093			1298
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	522	57	14023	0.093	49	5	1304
26	Wadsworth Off Ramp	4022	2011	10%	2640	2				13500	0.093			1256
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1		186	13663	0.093		17	1271

Table 10 : Future 2 Year Average Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	4022	2011	10%	2640	2	1	184		13691	0.093	17		1273
2	Wadsworth Off Ramp	4022	2011	10%	2290	2				13508	0.093			1256
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	54	541	14051	0.093	5	50	1307
4	Painted Rock Off Ramp	4022	2011	10%	2340	2				13997	0.093			1302
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	29	67	14059	0.093	3	6	1307
6	Orchard Off Ramp	4022	2011	10%	1710	2				14029	0.093			1305
7	Orchard On Ramp	4022	2011	10%	8730	2	1	48	39	15628	0.093	4	4	1453
8	Derby Off Ramp	4022	2011	10%	2430	2				15580	0.093			1449
9	Derby On Ramp	4022	2011	10%	19800	2	1	1074	76	14331	0.093	100	7	1333
10	USA Parkway Off Ramp	4022	2011	10%	2800	2				13257	0.093			1233
11	USA Parkway On Ramp	4120	2060	5%	2150	2	1	489	2817	16074	0.093	46	262	1495
12	Patrick Off Ramp	4120	2060	5%	890	2				15585	0.095			1481
13	Patrick On Ramp	4120	2060	5%	3060	2	1		2608	19747	0.095		248	1876
14	Patrick On Ramp Cont.	4120	2060	5%	5280	2				19747	0.095			1876
15	Patrick On Ramp Cont.	4120	2060	5%	12032	2	1	236		19747	0.095	22		1876
16	Mustang Off Ramp	4120	2060	5%	3080	2				19510	0.095			1853
17	Mustang On Ramp	4120	2060	5%	6860	2	1	384	2271	20303	0.095	37	216	1929
18	Lockwood Off Ramp	4120	2060	5%	1175	2				19918	0.095			1892
19	Lockwood On Ramp	4120	2060	5%	12400	2	1	4407	3126	23251	0.095	419	297	2209
20	Vista Off Ramp	4356	2178	5%	2250	2				18844	0.086			1621
21	Vista On Ramp	6534	2178	5%	350	3	1		11383	30227	0.086		979	2600
22	Vista On Ramp Cont	4356	2178	5%	1100	2				30227	0.086			2600
23	Vista On Ramp Cont	6534	2178	5%	620	3	1	1593		30227	0.086	137		2600
24	Sparks Off Ramp	4356	2178	5%	3050	2				27470	0.086			2362
25	Sparks On Ramp	6534	2178	5%	450	3	1		11149	38618	0.086		959	3321
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1	5544		38618	0.086	477		3321
27	McCarran Off Ramp	4356	2178	5%	1375	2				33074	0.086			2844
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		4409	37483	0.086		379	3224
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2			0	37483	0.086			3224
30	McCarran On Ramp	6534	2178	5%	2640	3	1		8441	44697	0.086		726	3844

Table 11 : Future EB East 7 Years Peak Hour Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	6534	2178	5%	2640	3	1	13800		55970	0.086	1187		4813
2	E.McCarran Off Ramp	4356	2178	5%	2540	2				42170	0.086			3627
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1	12370	8730	50900	0.086	1064	751	4377
4	Sparks Off Ramp	4356	2178	5%	2000	2				38530	0.086			3314
5	Sparks On Ramp	4356	2178	5%	1500	2	1	11590	2550	41080	0.086	997	219	3533
6	Vista Off Ramp	4356	2178	5%	2200	2				29490	0.086			2536
7	Vista On Ramp	4252	2126	10%	3600	2	1		8080	37580	0.095		768	3570
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	6840		37580	0.095	650		3570
9	Lockwood Off Ramp	4022	2011	10%	1800	2				30740	0.095			2920
10	Lockwood On Ramp	4022	2011	10%	5460	2	1	5120	930	31670	0.095	486	88	3009
11	Mustang Off Ramp	4022	2011	10%	3069	2				26550	0.095			2522
12	Mustang On Ramp	4022	2011	10%	13300	2	1		190	26740	0.095		18	2540
13	Mustang On Ramp Cont.	4022	2011	10%	5280	2				26740	0.095			2540
14	Mustang On Ramp Cont.	4022	2011	10%	4180	2	1	7000		26740	0.095	665		2540
15	Patrick Off Ramp	4022	2011	10%	2680	2				19750	0.095			1876
16	Patrick On Ramp	4022	2011	10%	8960	2	1	6380	1270	21010	0.095	606	121	1996
17	USA Parkway Off Ramp	4022	2011	10%	2220	2				14640	0.093			1362
18	USA Parkway On Ramp	4022	2011	10%	10560	2			2500	17140	0.093		233	1594
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1	90		17140	0.093	8		1594
20	Derby Off Ramp	4022	2011	10%	2020	2				17050	0.093			1586
21	Derby On Ramp	4022	2011	10%	8980	2	1	90	60	17110	0.093	8	6	1591
22	Orchard Off Ramp	4022	2011	10%	1750	2				17020	0.093			1583
23	Orchard On Ramp	4022	2011	10%	4320	2	1	120	60	17080	0.093	11	6	1588
24	Painted Rock Off Ramp	4022	2011	10%	1800	2				16960	0.093			1577
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	500	80	17040	0.093	47	7	1585
26	Wadsworth Off Ramp	4022	2011	10%	2640	2				16540	0.093			1538
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1		120	16660	0.093		11	1549

Table 12: Future WB East 7 Years Peak Hour Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	4022	2011	10%	2640	2	1	120		16760	0.093	11		1559
2	Wadsworth Off Ramp	4022	2011	10%	2290	2				16640	0.093			1548
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	80	500	17140	0.093	7	47	1594
4	Painted Rock Off Ramp	4022	2011	10%	2340	2				17060	0.093			1587
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	60	120	17180	0.093	6	11	1598
6	Orchard Off Ramp	4022	2011	10%	1710	2				17120	0.093			1592
7	Orchard On Ramp	4022	2011	10%	8730	2	1	60	90	17210	0.093	6	8	1601
8	Derby Off Ramp	4022	2011	10%	2430	2				17150	0.093			1595
9	Derby On Ramp	4022	2011	10%	19800	2	1	2510	90	17240	0.093	233	8	1603
10	USA Parkway Off Ramp	4022	2011	10%	2800	2				14730	0.093			1370
11	USA Parkway On Ramp	4120	2060	5%	2150	2	1	1270	6410	21150	0.093	118	596	1967
12	Patrick Off Ramp	4120	2060	5%	890	2				19880	0.095			1889
13	Patrick On Ramp	4120	2060	5%	3060	2	1		7000	26880	0.095		665	2554
14	Patrick On Ramp Cont.	4120	2060	5%	5280	2				26880	0.095			2554
15	Patrick On Ramp Cont.	4120	2060	5%	12032	2	1	190		26880	0.095	18		2554
16	Mustang Off Ramp	4120	2060	5%	3080	2				26690	0.095			2536
17	Mustang On Ramp	4120	2060	5%	6860	2	1	930	5180	31870	0.095	88	492	3028
18	Lockwood Off Ramp	4120	2060	5%	1175	2				30940	0.095			2939
19	Lockwood On Ramp	4120	2060	5%	12400	2	1	8090	6910	37840	0.095	769	656	3595
20	Vista Off Ramp	4356	2178	5%	2250	2				29750	0.086			2559
21	Vista On Ramp	6534	2178	5%	350	3	1		11810	41560	0.086		1016	3574
22	Vista On Ramp Cont	4356	2178	5%	1100	2				41560	0.086			3574
23	Vista On Ramp Cont	6534	2178	5%	620	3	1	2560		41560	0.086	220		3574
24	Sparks Off Ramp	4356	2178	5%	3050	2				39000	0.086			3354
25	Sparks On Ramp	6534	2178	5%	450	3	1		12530	51540	0.086		1078	4432
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1	8700		51540	0.086	748		4432
27	McCarran Off Ramp	4356	2178	5%	1375	2				42840	0.086			3684
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		5970	48800	0.086		513	4197
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2				48800	0.086			4197
30	McCarran On Ramp	6534	2178	5%	2640	3	1		8160	56960	0.086		702	4899

Table 13: Future 15 Year Average Estimate **I 80 East Eastbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	4356	2178	5%	2640	2	1	15470		65370	0.086	1330		5622
2	E.McCarran Off Ramp	4356	2178	5%	2540	2				49900	0.086			4291
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1	14040	11580	61470	0.086	1207	996	5286
4	Sparks Off Ramp	4356	2178	5%	2000	2				47430	0.086			4079
5	Sparks On Ramp	4356	2178	5%	1500	2	1	16500	3340	50780	0.086	1419	287	4367
6	Vista Off Ramp	4356	2178	5%	2200	2				34270	0.086			2947
7	Vista On Ramp	4252	2126	10%	3600	2	1		12840	47120	0.095		1220	4476
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	8360		47120	0.095	794		4476
9	Lockwood Off Ramp	4252	2126	10%	1800	2				38760	0.095			3682
10	Lockwood On Ramp	4252	2126	10%	5460	2	1	7470	1090	39840	0.095	710	104	3785
11	Mustang Off Ramp	4252	2126	10%	3069	2				32370	0.095			3075
12	Mustang On Ramp	4252	2126	10%	13300	2	1		250	32620	0.095		24	3099
13	Mustang On Ramp Cont.	4252	2126	10%	5280	2				62620	0.095			5949
14	Mustang On Ramp Cont.	4252	2126	10%	4180	2	1	8240		32620	0.095	783		3099
15	Patrick Off Ramp	4252	2126	10%	2680	2				24380	0.095			2316
16	Patrick On Ramp	4252	2126	10%	8960	2	1	7530	1670	26060	0.095	715	159	2476
17	USA Parkway Off Ramp	4252	2126	10%	2220	2				18530	0.093			1723
18	USA Parkway On Ramp	4022	2011	10%	10560	2			3090	21620	0.093		287	2011
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1	130		21620	0.093	12		2011
20	Derby Off Ramp	4022	2011	10%	2020	2				21500	0.093			2000
21	Derby On Ramp	4022	2011	10%	8980	2	1	130	90	21590	0.093	12	8	2008
22	Orchard Off Ramp	4022	2011	10%	1750	2				21460	0.093			1996
23	Orchard On Ramp	4022	2011	10%	4320	2	1	170	90	21550	0.093	16	8	2004
24	Painted Rock Off Ramp	4022	2011	10%	1800	2				21380	0.093			1988
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	570	110	21490	0.093	53	10	1999
26	Wadsworth Off Ramp	4022	2011	10%	2640	2				20920	0.093			1946
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1		140	21060	0.093		13	1959

Table 14: Future 15 Year Average Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	4022	2011	10%	2640	2	1	130		21090	0.093	12		1961
2	Wadsworth Off Ramp	4022	2011	10%	2290	2				20960	0.093			1949
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	110	570	21530	0.093	10	53	2002
4	Painted Rock Off Ramp	4022	2011	10%	2340	2				21420	0.093			1992
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	90	170	21590	0.093	8	16	2008
6	Orchard Off Ramp	4022	2011	10%	1710	2				21500	0.093			2000
7	Orchard On Ramp	4022	2011	10%	8730	2	1	90	130	21630	0.093	8	12	2012
8	Derby Off Ramp	4022	2011	10%	2430	2				21540	0.093			2003
9	Derby On Ramp	4022	2011	10%	19800	2	1	3090	130	21670	0.093	287	12	2015
10	USA Parkway Off Ramp	4022	2011	10%	2800	2				18570	0.093			1727
11	USA Parkway On Ramp	4356	2178	5%	2150	2	1	1680	7520	26090	0.093	156	699	2426
12	Patrick Off Ramp	4356	2178	5%	890	2				24410	0.095			2319
13	Patrick On Ramp	4356	2178	5%	3060	2	1		8250	32660	0.095		784	3103
14	Patrick On Ramp Cont.	4356	2178	5%	5280	2				32660	0.095			3103
15	Patrick On Ramp Cont.	4356	2178	5%	12032	2	1	250		32660	0.095	24		3103
16	Mustang Off Ramp	4356	2178	5%	3080	2				32410	0.095			3079
17	Mustang On Ramp	4356	2178	5%	6860	2	1	1090	7520	39930	0.095	104	714	3793
18	Lockwood Off Ramp	4356	2178	5%	1175	2				38840	0.095			3690
19	Lockwood On Ramp	4356	2178	5%	12400	2	1	12850	8380	47220	0.095	1221	796	4486
20	Vista Off Ramp	4356	2178	5%	2250	2				34370	0.086			2956
21	Vista On Ramp	6534	2178	5%	350	3	1		16580	50950	0.086		1426	4382
22	Vista On Ramp Cont	4356	2178	5%	1100	2				50950	0.086			4382
23	Vista On Ramp Cont	6534	2178	5%	620	3	1	3350		50950	0.086	288		4382
24	Sparks Off Ramp	4356	2178	5%	3050	2				47600	0.086			4094
25	Sparks On Ramp	6534	2178	5%	450	3	1		14100	61690	0.086		1213	5305
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1	11560		61690	0.086	994		5305
27	McCarran Off Ramp	4356	2178	5%	1375	2				50130	0.086			4311
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		6680	56810	0.086		574	4886
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2				56810	0.086			4886
30	McCarran On Ramp	6534	2178	5%	2640	3	1		8900	65710	0.086		765	5651

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV			25 year Balanced Volumes		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline	Off-Ramp	On-Ramp	Mainline Vol
1	Beginning Segment	4356	2178	5%	2640	2	1	14740		74560	0.086	1268		6412	1268		**6412**
2	E.McCarran Off Ramp	4356	2178	5%	2540	2				59820	0.086			5145			5145
3	E.McCarran On Ramp	4356	2178	5%	3720	2	1	14400	16270	76090	0.086	1238	1399	6544	1238	1399	6544
4	Sparks Off Ramp	4356	2178	5%	2000	2				61690	0.086			5305			5305
5	Sparks On Ramp	4356	2178	5%	1500	2	1	18240	4400	66130	0.086	1569	378	5687	1433	478	5783
6	Vista Off Ramp	4356	2178	5%	2200	2				47900	0.086			4119			4350
7	Vista On Ramp	4252	2126	10%	3600	2	1		18440	66340	0.095		1752	6302		1952	6302
8	Vista On Ramp Cont	4252	2126	10%	9304	2	1	11380		66340	0.095	1081		6302	1081		6302
9	Lockwood Off Ramp	4252	2126	10%	1800	2				54950	0.095			5220			5221
10	Lockwood On Ramp	4252	2126	10%	5460	2	1	9610	1640	56590	0.095	913	156	5376	913	156	5377
11	Mustang Off Ramp	4252	2126	10%	3069	2				46980	0.095			4463			4464
12	Mustang On Ramp	4252	2126	10%	13300	2	1		420	47400	0.095		40	4503		70	4534
13	Mustang On Ramp Cont.	4252	2126	10%	5280	2				47400	0.095			4503			4534
14	Mustang On Ramp Cont.	4252	2126	10%	4180	2	1	16170		47400	0.095	1536		4503	1536		4534
15	Patrick Off Ramp	4252	2126	10%	2680	2				31240	0.095			2968			2998
16	Patrick On Ramp	4252	2126	10%	8960	2	1	12430	3590	34830	0.095	1181	341	3309	1181	341	3339
17	USA Parkway Off Ramp	4252	2126	10%	2220	2				22400	0.093			2083			2158
18	USA Parkway On Ramp	4022	2011	10%	10560	2			5660	28060	0.093		526	2610		466	2624
19	USA Parkway On Ramp Cont.	4022	2011	10%	8976	2	1	160		27900	0.093	15		2595	40		2624
20	Derby Off Ramp	4022	2011	10%	2020	2				27900	0.093			2595			2584
21	Derby On Ramp	4022	2011	10%	8980	2	1	170	130	28030	0.093	16	12	2607	40	15	2599
22	Orchard Off Ramp	4022	2011	10%	1750	2				27860	0.093			2591			2559
23	Orchard On Ramp	4022	2011	10%	4320	2	1	220	120	27980	0.093	20	11	2602	40	15	2574
24	Painted Rock Off Ramp	4022	2011	10%	1800	2				27760	0.093			2582			2534
25	Painted Rock On Ramp	4022	2011	10%	17610	2	1	1110	140	27900	0.093	103	13	2595	103	20	2554
26	Wadsworth Off Ramp	4022	2011	10%	2640	2				26800	0.093			2492			2451
27	Wadsworth On Ramp	4022	2011	10%	2640	2	1		230	27020	0.093		21	2513		62	2513

Table 16: Future 25 Year Average Estimate **I 80 East Westbound**

Segment	Location	Capacity	Lane Capacity	Truck %	Distance Feet	Mainline Lanes	Ramp Lanes	LCA AADT			K	DDHV		
								Off-Ramp	On-Ramp	Mainline		Off-Ramp	On-Ramp	Mainline
1	Beginning Segment	4022	2011	10%	2640	2	1	220		27210	0.093	20		2531
2	Wadsworth Off Ramp	4022	2011	10%	2290	2				26990	0.093			2510
3	Wadsworth On Ramp	4022	2011	10%	17900	2	1	140	1110	28100	0.093	13	103	2613
4	Painted Rock Off Ramp	4022	2011	10%	2340	2				27960	0.093			2600
5	Painted Rock On Ramp	4022	2011	10%	4340	2	1	120	220	28190	0.093	11	20	2622
6	Orchard Off Ramp	4022	2011	10%	1710	2				28070	0.093			2611
7	Orchard On Ramp	4022	2011	10%	8730	2	1	130	170	28240	0.093	12	16	2626
8	Derby Off Ramp	4022	2011	10%	2430	2				28110	0.093			2614
9	Derby On Ramp	4022	2011	10%	19800	2	1	5690	160	28270	0.093	529	15	2629
10	USA Parkway Off Ramp	4022	2011	10%	2800	2				22580	0.093			2100
11	USA Parkway On Ramp	4356	2178	5%	2150	2	1	3630	12560	35140	0.093	338	1168	3268
12	Patrick Off Ramp	4356	2178	5%	890	2				31520	0.095			2994
13	Patrick On Ramp	4356	2178	5%	3060	2	1		16350	47870	0.095		1553	4548
14	Patrick On Ramp Cont.	4356	2178	5%	5280	2				47870	0.095			4548
15	Patrick On Ramp Cont.	4356	2178	5%	12032	2	1	420		47870	0.095	40		4548
16	Mustang Off Ramp	4356	2178	5%	3080	2				47450	0.095			4508
17	Mustang On Ramp	4356	2178	5%	6860	2	1	1650	9780	57230	0.095	157	929	5437
18	Lockwood Off Ramp	4356	2178	5%	1175	2				55580	0.095			5280
19	Lockwood On Ramp	4356	2178	5%	12400	2	1	18470	11500	67080	0.095	1755	1093	6373
20	Vista Off Ramp	4356	2178	5%	2250	2				48610	0.086			4180
21	Vista On Ramp	6534	2178	5%	350	3	1		18730	67340	0.086		1611	5791
22	Vista On Ramp Cont	4356	2178	5%	1100	2				67340	0.086			5791
23	Vista On Ramp Cont	6534	2178	5%	620	3	1	4470		67340	0.086	384		5791
24	Sparks Off Ramp	4356	2178	5%	3050	2				62870	0.086			5407
25	Sparks On Ramp	6534	2178	5%	450	3	1		14710	77580	0.086		1265	6672
26	Sparks On Ramp Cont.	4356	2178	5%	2640	2	1	16140		77580	0.086	1388		6672
27	McCarran Off Ramp	4356	2178	5%	1375	2				61440	0.086			5284
28	McCarran On Loop Ramp	6534	2178	5%	350	3	1		6750	68200	0.086		581	5865
29	McCarran On Loop Ramp Cont.	4356	2178	5%	1400	2				68200	0.086			5865
30	McCarran On Ramp	6534	2178	5%	2640	3	1		8480	76680	0.086		729	6594

Table 1. 7 Years Eastbound Freeway Capacity Analysis **I-80 West**

SUB	Subsection	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	2	1	2640	1760	103	1760	4022	0	0.44	65	13.5	B
2	West Verdi Off	2		2100	0	0	1657	4022	0	0.41	65	12.7	B
3	West Verdi On	2	1	1740	307	0	1964	4022	0	0.49	65	15.1	B
4	West Verdi On Cont.	2		2960	0	0	1964	4022	0	0.49	65	15.1	B
5	Verdi On	2	1	5100	137	185	2101	4022	0	0.52	65	16.2	B
6	Garson Off	2		2920	0	0	1916	4022	0	0.48	65	14.7	B
7	Garson On	2	1	4350	399	0	2315	4022	0	0.58	65	17.8	B
8	East Verdi On Acceleration	3	1	680	316	0	2631	6033	0	0.44	65	13.5	B
9	East Verdi On	2	1	880	0	251	2631	4022	0	0.65	65	20.2	C
10	Mogul Off	2		1740	0	0	2380	4022	0	0.59	65	18.3	C
11	Mogul On Acceleration	3	1	450	201	0	2581	6033	0	0.43	65	13.2	B
12	Mogul On	2	1	1600	0	255	2581	4022	0	0.64	65	19.9	C
13	West 4th Off	2	1	6980	0	330	2326	4022	0	0.58	65	17.9	B
14	Robb Drive Off	2		1500	0	0	1996	4356	0	0.46	65	15.4	B
15	Robb Drive On Acceleration	4	2	4000	1008	0	3004	8712	0	0.34	65	11.6	B
16	Rob Drive On Cont	3	1	1200	0	710	3004	6534	0	0.46	65	15.4	B
17	West McCarran Off	2		4470	0	0	2294	4356	0	0.53	65	17.6	B
18	West McCarran On	2	1	2640	931	3225	3225	4356	0	0.74	64	25.1	C

Table 2. 7 Years Westbound Freeway Capacity Analysis **I-80 West**

SUB	Subsection	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	4	2	2640	3243	1121	3243	8712	0	0.37	65	12.5	B
2	West McCarran Off	3		2640	0	0	2122	6534	0	0.32	65	10.9	A
3	West McCarran On	3	1	4300	760	1122	2882	6534	0	0.44	65	14.8	B
4	Robb Drive Off	3		3300	0	0	1760	6534	0	0.27	65	9	A
5	Robb Drive On, Acceleration	3	1	430	461	0	2221	6180	0	0.36	65	11.4	B
6	Robb Drive On cont	2		7200	0	0	2221	4120	0	0.54	65	17.1	B
7	West 4th Street On, Acceleratio	3	1	440	350	0	2571	6180	0	0.42	65	13.2	B
8	West 4th Street On cont	2	1	890	0	266	2571	4120	0	0.62	65	19.8	C
9	Exit 7, Mogul Off Ramp	2		700	0	0	2305	4120	0	0.56	65	17.7	B
10	Mogul On, Acceleration	3	1	160	352	0	2657	6180	0	0.43	65	13.6	B
11	Mogul On cont	2	1	6840	0	303	2657	4120	0	0.64	65	20.4	C
12	Exit 5, East Verdi Off Ramp	2	1	5350	0	459	2354	4120	0	0.57	65	18.1	C
13	Exit 4, Garson Off Ramp	2		1480	0	0	1895	4120	0	0.46	65	14.6	B
14	Garson On, Acceleration	3	1	765	311	0	2206	5895	0	0.37	65	11.3	B
15	Garson On cont	2	1	4100	0	141	2206	3930	0	0.56	65	17	B
16	Exit 3, Verdi Off Ramp	2	1	5430	0	608	2065	3930	0	0.53	65	15.9	B
17	Exit 2, West Verdi Off	2	1	2590	0	51	1457	3930	0	0.37	65	11.2	B
18	Exit 1, West Verdi Off	2		1156	0	0	1406	3930	0	0.36	65	10.8	A
19	West Verdi On Ramp	2	1	2640	325	1731	1731	3930	0	0.44	65	13.3	B

Table 3. 15 Years Eastbound Freeway Capacity Analysis **I-80 West**

SUB	Subsection	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	2	1	2640	1913	77	1913	4022		0.48	65	14.7	B
2	West Verdi Off	2		2100	0	0	1836	4022		0.46	65	14.1	B
3	West Verdi On	2	1	1740	675	0	2511	4022		0.62	65	19.3	C
4	West Verdi On Cont.	2		2960	0	0	2511	4022		0.62	65	19.3	C
5	Verdi On	2	1	5100	201	266	2712	4022		0.67	65	20.9	C
6	Garson Off	2		2920	0	0	2446	4022		0.61	65	18.8	C
7	Garson On	2	1	4350	645	0	3091	4022		0.77	64	24.2	C
8	East Verdi On Acceleration	3	1	680	394	0	3485	6033		0.58	65	17.9	B
9	East Verdi On	2	1	880	0	303	3485	4022		0.87	61	28.7	D
10	Mogul Off	2		1740	0	0	3182	4022		0.79	63	25.1	C
11	Mogul On Acceleration	3	1	450	272	0	3454	6033		0.57	65	17.7	B
12	Mogul On	2	1	1600	0	480	3454	4022		0.86	61	28.2	D
13	West 4th Off	2	1	6980	0	505	2974	4022		0.74	64	23.1	C
14	Robb Drive Off	2		1500	0	0	2469	4356		0.57	65	19	C
15	Robb Drive On Acceleration	4	2	4000	1187	0	3656	8712		0.42	65	14.1	B
16	Rob Drive On Cont	3	1	1200	0	927	3656	6534		0.56	65	18.7	C
17	West McCarran Off	2		4470	0	0	2729	4356		0.63	65	21	C
18	West McCarran On	2	1	2640	1208	3937	3937	4356		0.9	59	33.4	D

Table 4. 15 Years Westbound Freeway Capacity Analysis **I-80 West**

SUB	Subsection	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	4	2	2640	3972	1292	3972	8712	0	0.46	65	15.3	B
2	West McCarran Off	3		2640	0	0	2680	6534	0	0.41	65	13.7	B
3	West McCarran On	3	1	4300	996	1313	3676	6534	0	0.56	65	18.9	C
4	Robb Drive Off	3		3300	0	0	2363	6534	0	0.36	65	12.1	B
5	Robb Drive On, Acceleration	3	1	430	507	0	2870	6180	0	0.46	65	14.7	B
6	Robb Drive On cont	2		7200	0	0	2870	4120	0	0.7	65	22.1	C
7	West 4th Street On, Acceleratio	3	1	440	443	0	3313	6180	0	0.54	65	17	B
8	West 4th Street On cont	2	1	890	0	307	3313	4120	0	0.8	63	26.3	D
9	Exit 7, Mogul Off Ramp	2		700	0	0	3006	4120	0	0.73	64	23.3	C
10	Mogul On, Acceleration	3	1	160	397	0	3403	6180	0	0.55	65	17.5	B
11	Mogul On cont	2	1	6840	0	335	3403	4120	0	0.83	62	27.3	D
12	Exit 5, East Verdi Off Ramp	2	1	5350	0	779	3068	4120	0	0.74	64	23.9	C
13	Exit 4, Garson Off Ramp	2		1480	0	0	2289	4120	0	0.56	65	17.6	B
14	Garson On, Acceleration	3	1	765	368	0	2657	5895	0	0.45	65	13.6	B
15	Garson On cont	2	1	4100	0	230	2657	3930	0	0.68	65	20.4	C
16	Exit 3, Verdi Off Ramp	2	1	5430	0	924	2427	3930	0	0.62	65	18.7	C
17	Exit 2, West Verdi Off	2	1	2590	0	50	1503	3930	0	0.38	65	11.6	B
18	Exit 1, West Verdi Off	2		1156	0	0	1453	3930	0	0.37	65	11.2	B
19	West Verdi On Ramp	2	1	2640	427	1880	1880	3930	0	0.48	65	14.5	B

Table 5. 25 Years Eastbound Freeway Capacity Analysis **I-80 West**

SUB	Subsection	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	2	1	2640	2075	80	2075	4022	1500	0.29	43	13.4	F
2	West Verdi Off	2		2100	0	0	1995	4022	2100	0.27	14	37.4	F
3	West Verdi On	2	1	1740	1492	0	3487	4022	1740	0.64	22	57.2	F
4	West Verdi On Cont.	2		2960	0	0	3487	4022	2960	0.64	18	70.4	F
5	Verdi On	2	1	5100	430	249	3917	4022	5100	0.75	18	81.6	F
6	Garson Off	2		2920	0	0	3668	4022	2920	0.68	13	106.3	F
7	Garson On	2	1	4350	764	0	4432	4022	4350	0.87	21	82.3	F
8	East Verdi On Acceleration	3	1	680	506	0	4938	6033	680	0.67	10	134.1	F
9	East Verdi On	2	1	880	0	381	4938	4022	0	1	52	38.5	E
10	Mogul Off	2		1740	0	0	4557	4022	0	0.92	58	32.1	D
11	Mogul On Acceleration	3	1	450	324	0	4881	6033	202	0.67	28	47.3	F
12	Mogul On	2	1	1600	0	684	4881	4022	0	1	52	38.5	E
13	West 4th Off	2	1	6980	0	615	4197	4022	0	0.86	61	28.3	D
14	Robb Drive Off	2		1500	0	0	3582	4356	0	0.68	65	22.7	C
15	Robb Drive On Acceleration	4	2	4000	1307	0	4889	8712	580	0.49	65	16.4	B
16	Rob Drive On Cont	3	1	1200	0	1358	4889	6534	1200	0.65	65	21.8	C
17	West McCarran Off	2		4470	0	0	3531	4356	4470	0.71	65	23.8	C
18	West McCarran On	2	1	2640	1317	4848	4848	4356	0	0.93	57	35.5	E

Table 6. 25 Years Westbound Freeway Capacity Analysis **I-80 West**

SUB	Subsection	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	4	2	2640	4934	1373	4934	8712	0	0.57	65	19	C
2	West McCarran Off	3		2640	0	0	3561	6534	0	0.54	65	18.3	C
3	West McCarran On	3	1	4300	1384	1348	4945	6534	* 4212	0.61	32	40.6	F
4	Robb Drive Off	3		3300	0	0	3597	6534	** 3300	0.4	8	103.3	F
5	Robb Drive On, Acceleration	3	1	430	761	0	4358	6180	** 430	0.55	9	121.2	F
6	Robb Drive On cont	2		7200	0	0	4358	4120	** 7200	0.82	18	91.2	F
7	West 4th Street On, Acceleratio	3	1	440	654	0	5012	6180	** 440	0.65	10	138.8	F
8	West 4th Street On cont	2	1	890	0	347	5012	4120	** 890	0.98	30	66.3	F
9	Exit 7, Mogul Off Ramp	2		700	0	0	4665	4120	** 700	0.91	22	85.1	F
10	Mogul On, Acceleration	3	1	160	383	0	5048	4120	0	1	52	39.4	E
11	Mogul On cont	2	1	6840	0	481	5048	4120	0	1	52	39.4	E
12	Exit 5, East Verdi Off Ramp	2	1	5350	0	927	4567	4120	0	0.9	59	31.6	D
13	Exit 4, Garson Off Ramp	2		1480	0	0	3640	4120	0	0.72	65	23	C
14	Garson On, Acceleration	3	1	765	405	0	4045	3930	0	0.86	61	27.6	D
15	Garson On cont	2	1	4100	0	428	4045	3930	0	0.86	61	27.6	D
16	Exit 3, Verdi Off Ramp	2	1	5430	0	1980	3617	3930	0	0.77	64	23.6	C
17	Exit 2, West Verdi Off	2	1	2590	0	61	1637	3930	0	0.35	65	10.5	A
18	Exit 1, West Verdi Off	2		1156	0	0	1576	3930	0	0.33	65	10.1	A
19	West Verdi On Ramp	2	1	2640	449	2025	2025	3930	0	0.45	65	13.6	B

Table 7. 7 Years Eastbound Freeway Capacity Analysis **I-80 East**

Segment	Location	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	3		2640	4812	1187	4812	6534	0	0.74	64	24.9	C
2	E.McCarran Off Ramp	2		2540	0	0	3625	4356	626	0.83	46	39.4	F
3	E.McCarran On Ramp	2		3720	751	1064	4376	4356	0	1	52	41.7	E
4	Sparks Off Ramp	2		2000	0	0	3312	4356	0	0.76	64	25.7	C
5	Sparks On Ramp	2		1500	218	907	3530	4356	0	0.81	63	27.9	D
6	Vista Off Ramp	2		2200	0	0	2623	4356	0	0.6	65	20.1	C
7	Vista On Ramp	2		3600	868	0	3491	4252	0	0.82	63	27.8	D
8	Vista On Ramp Cont	2		9304	0	574	3491	4252	0	0.82	63	27.8	D
9	Lockwood Off Ramp	2		1800	0	0	2917	4022	0	0.72	65	22.5	C
10	Lockwood On Ramp	2		5460	88	485	3005	4022	0	0.74	64	23.3	C
11	Mustang Off Ramp	2		3069	0	0	2520	4022	0	0.62	70	17.9	B
12	Mustang On Ramp	2		13300	59	0	2579	4022	0	0.64	70	18.4	C
13	Mustang On Ramp Cont.	2		5280	0	0	2579	4022	0	0.64	70	18.4	C
14	Mustang On Ramp Cont.	2		4180	0	664	2579	4022	0	0.64	70	18.4	C
15	Patrick Off Ramp	2		2680	0	0	1915	4022	0	0.47	70	13.6	B
16	Patrick On Ramp	2		17724	122	605	2037	4022	0	0.51	70	14.5	B
17	USA Parkway Off Ramp	2		2220	0	0	1432	4022	0	0.36	70	10.2	A
18	USA Parkway On Ramp	2		10560	196	0	1628	4022	0	0.4	70	11.6	B
19	USA Parkway On Ramp Cont.	2		8976	0	35	1628	4022	0	0.4	70	11.6	B
20	Derby Off Ramp	2		2020	0	0	1593	4022	0	0.4	70	11.3	B
21	Derby On Ramp	2		8980	7	32	1600	4022	0	0.4	70	11.4	B
22	Orchard Off Ramp	2		1750	0	0	1568	4022	0	0.39	70	11.2	B
23	Orchard On Ramp	2		4320	8	10	1576	4022	0	0.39	70	11.2	B
24	Painted Rock Off Ramp	2		1800	0	0	1566	4022	0	0.39	70	11.2	B
25	Painted Rock On Ramp	2		17610	17	70	1583	4022	0	0.39	70	11.3	B
26	Wadsworth Off Ramp	2		2640	0	0	1513	4022	0	0.38	70	10.8	A
27	Wadsworth On Ramp	2		2640	37	1550	1550	4022	0	0.38	70	11	B

Table 8. 7 Years Westbound Freeway Capacity Analysis **I-80 East**

Segment	Location	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	2		2640	1556	45	1556	4022	0	0.39	65	12	B
2	Wadsworth Off Ramp	2		2290	0	0	1511	4022	0	0.38	65	11.6	B
3	Wadsworth On Ramp	2		17900	74	7	1585	4022	0	0.39	65	12.2	B
4	Painted Rock Off Ramp	2		2340	0	0	1578	4022	0	0.39	65	12.1	B
5	Painted Rock On Ramp	2		4340	11	6	1589	4022	0	0.4	65	12.2	B
6	Orchard Off Ramp	2		1710	0	0	1583	4022	0	0.39	65	12.2	B
7	Orchard On Ramp	2		8730	7	6	1590	4022	0	0.4	65	12.2	B
8	Derby Off Ramp	2		2430	0	0	1584	4022	0	0.39	65	12.2	B
9	Derby On Ramp	2		19800	7	135	1591	4022	0	0.4	65	12.2	B
10	USA Parkway Off Ramp	2		2800	0	0	1456	4022	0	0.36	65	11.2	B
11	USA Parkway On Ramp	2		23130	330	104	1786	4120	0	0.43	65	13.7	B
12	Patrick Off Ramp	2		890	0	0	1682	4120	0	0.41	65	12.9	B
13	Patrick On Ramp	2		3060	547	0	2229	4120	0	0.54	65	17.1	B
14	Patrick On Ramp Cont.	2		5280	0	0	2229	4120	0	0.54	65	17.1	B
15	Patrick On Ramp Cont.	2		12032	0	35	2229	4120	0	0.54	65	17.1	B
16	Mustang Off Ramp	2		3080	0	0	2194	4120	0	0.53	65	16.9	B
17	Mustang On Ramp	2		6860	326	51	2520	4120	0	0.61	65	19.4	C
18	Lockwood Off Ramp	2		1175	0	0	2469	4120	0	0.6	65	19	C
19	Lockwood On Ramp	2		12400	560	672	3029	4120	0	0.74	64	23.5	C
20	Vista Off Ramp	2		2250	0	0	2357	4356	0	0.54	65	18.1	C
21	Vista On Ramp	3		350	1079	0	3436	6534	0	0.53	65	17.6	B
22	Vista On Ramp Cont	2		1100	0	0	3436	4356	0	0.79	63	27.1	D
23	Vista On Ramp Cont	3		620	0	330	3436	6534	0	0.53	65	17.6	B
24	Sparks Off Ramp	2		3050	0	0	3106	4356	0	0.71	65	24	C
25	Sparks On Ramp	3		450	1043	0	4149	6534	0	0.63	65	21.3	C
26	Sparks On Ramp Cont.	2		2640	0	668	4149	4356	0	0.95	56	37.1	E
27	McCarran Off Ramp	2		1375	0	0	3481	4356	0	0.8	63	27.6	D
28	McCarran On Loop Ramp	3		350	544	0	4025	6534	0	0.62	65	20.6	C
29	McCarran On Loop Ramp Cont.	2		1400	0	0	4025	4356	0	0.92	58	34.8	D
30	McCarran On Ramp	3		2640	726	4751	4751	6534	0	0.73	65	24.6	C

Table 9. 15 Years Eastbound Freeway Capacity Analysis **I-80 East**

Segment	Location	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	3		2640	5623	1330	5623	6534	0	0.86	61	30.7	D
2	E.McCarran Off Ramp	2		2540	0	0	4293	4356	0	0.99	53	40.2	E
3	E.McCarran On Ramp	2		3720	996	1207	5289	6534	931	0.81	63	28	D
4	Sparks Off Ramp	2		2000	0	0	4082	4356	2000	0.94	57	35.8	E
5	Sparks On Ramp	2		1500	287	1419	4369	4356	0	0.98	54	39.4	E
6	Vista Off Ramp	2		2200	0	0	2950	4356	0	0.66	65	22.1	C
7	Vista On Ramp	2		3600	1319	0	4269	4252	0	0.99	53	39.3	E
8	Vista On Ramp Cont	2		9304	0	695	4269	4252	0	0.99	53	39.3	E
9	Lockwood Off Ramp	2		1800	0	0	3574	4252	0	0.83	62	28.1	D
10	Lockwood On Ramp	2		5460	140	710	3714	4252	0	0.86	61	29.9	D
11	Mustang Off Ramp	2		3069	0	0	3004	4252	0	0.69	69	21.4	C
12	Mustang On Ramp	2		13300	63	0	3067	4252	0	0.71	69	21.9	C
13	Mustang On Ramp Cont.	2		5280	0	0	3067	4252	0	0.71	69	21.9	C
14	Mustang On Ramp Cont.	2		4180	0	782	3067	4252	0	0.71	69	21.9	C
15	Patrick Off Ramp	2		2680	0	0	2285	4252	0	0.53	70	16.1	B
16	Patrick On Ramp	2		17724	240	714	2525	4252	0	0.58	70	17.8	B
17	USA Parkway Off Ramp	2		2220	0	0	1811	4252	0	0.42	70	12.7	B
18	USA Parkway On Ramp	2		10560	252	0	2063	4252	0	0.48	70	14.5	B
19	USA Parkway On Ramp Cont.	2		8976	0	40	2063	4022	0	0.51	70	14.5	B
20	Derby Off Ramp	2		2020	0	0	2023	4022	0	0.5	70	14.3	B
21	Derby On Ramp	2		8980	9	40	2032	4022	0	0.5	70	14.3	B
22	Orchard Off Ramp	2		1750	0	0	1992	4022	0	0.49	70	14	B
23	Orchard On Ramp	2		4320	9	25	2001	4022	0	0.49	70	14.1	B
24	Painted Rock Off Ramp	2		1800	0	0	1976	4022	0	0.48	70	13.9	B
25	Painted Rock On Ramp	2		17610	20	80	1996	4022	0	0.49	70	14.1	B
26	Wadsworth Off Ramp	2		2640	0	0	1916	4022	0	0.47	70	13.5	B
27	Wadsworth On Ramp	2		2640	43	1959	1959	4022	0	0.48	70	13.8	B

Table 10. 15 Years Westbound Freeway Capacity Analysis **I-80 East**

Segment	Location	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	2		2640	1962	20	1962	4022	0	0.49	65	15.1	B
2	Wadsworth Off Ramp	2		2290	0	0	1942	4022	0	0.48	65	14.9	B
3	Wadsworth On Ramp	2		17900	86	10	2028	4022	0	0.5	65	15.6	B
4	Painted Rock Off Ramp	2		2340	0	0	2018	4022	0	0.5	65	15.5	B
5	Painted Rock On Ramp	2		4340	19	8	2037	4022	0	0.51	65	15.7	B
6	Orchard Off Ramp	2		1710	0	0	2029	4022	0	0.5	65	15.6	B
7	Orchard On Ramp	2		8730	13	8	2042	4022	0	0.51	65	15.7	B
8	Derby Off Ramp	2		2430	0	0	2034	4022	0	0.51	65	15.6	B
9	Derby On Ramp	2		19800	13	288	2047	4022	0	0.51	65	15.7	B
10	USA Parkway Off Ramp	2		2800	0	0	1759	4022	0	0.44	65	13.5	B
11	USA Parkway On Ramp	2		23130	699	121	2458	4356	0	0.56	65	18.9	C
12	Patrick Off Ramp	2		890	0	0	2337	4356	0	0.54	65	18	B
13	Patrick On Ramp	2		3060	783	0	3120	4356	0	0.72	65	24.1	C
14	Patrick On Ramp Cont.	2		5280	0	0	3120	4356	0	0.72	65	24.1	C
15	Patrick On Ramp Cont.	2		12032	0	25	3120	4356	0	0.72	65	24.1	C
16	Mustang Off Ramp	2		3080	0	0	3095	4356	0	0.71	65	23.9	C
17	Mustang On Ramp	2		6860	713	102	3808	4356	3607	0.84	40	45.4	F
18	Lockwood Off Ramp	2		1175	0	0	3706	4356	1175	0.82	17	104.2	F
19	Lockwood On Ramp	2		12400	796	1221	4502	4356	0	1	52	41.7	E
20	Vista Off Ramp	2		2250	0	0	3281	4356	435	0.72	54	28.9	F
21	Vista On Ramp	3		350	1226	0	4507	6534	350	0.67	13	114.2	F
22	Vista On Ramp Cont	2		1100	0	0	4507	4356	0	1	52	41.7	E
23	Vista On Ramp Cont	3		620	0	404	4507	6534	0	0.67	65	22.4	C
24	Sparks Off Ramp	2		3050	0	0	4103	4356	0	0.91	59	33.8	D
25	Sparks On Ramp	3		450	1201	0	5304	6534	0	0.79	63	27.2	D
26	Sparks On Ramp Cont.	2		2640	0	993	5304	6534	0	0.79	63	27.2	D
27	McCarran Off Ramp	2		1375	0	0	4311	4356	0	0.96	55	38.1	E
28	McCarran On Loop Ramp	3		350	574	0	4885	6534	0	0.73	64	24.7	C
29	McCarran On Loop Ramp Cont.	2		1400	0	0	4885	6534	0	0.73	64	24.7	C
30	McCarran On Ramp	3		2640	765	5650	5650	6534	0	0.85	62	30	D

Table 11. 25 Years Eastbound Freeway Capacity Analysis **I-80 East**

Segment	Location	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	3		2640	6411	1268	6411	6534	2640	0.88	24	79	F
2	E.McCarran Off Ramp	2		2540	0	0	5143	6534	2540	0.68	11	130.3	F
3	E.McCarran On Ramp	2		3720	1400	1238	6543	5853	0	1	52	37.4	E
4	Sparks Off Ramp	2		2000	0	0	5305	6534	0	0.73	65	24.5	C
5	Sparks On Ramp	2		1500	480	1432	5785	6172	0	0.85	62	28.3	D
6	Vista Off Ramp	2		2200	0	0	4353	4356	0	0.9	59	33.3	D
7	Vista On Ramp	2		3600	1954	0	6307	6378	0	0.85	61	29.5	D
8	Vista On Ramp Cont	2		9304	0	1081	6307	6378	7370	0.79	28	59.9	F
9	Lockwood Off Ramp	2		1800	0	0	5226	4252	1800	0.96	27	75.9	F
10	Lockwood On Ramp	2		5460	156	913	5382	4252	0	1	52	40.7	E
11	Mustang Off Ramp	2		3069	0	0	4469	4252	0	0.83	65	27.2	D
12	Mustang On Ramp	2		13300	68	0	4537	4252	0	0.85	64	28	D
13	Mustang On Ramp Cont.	2		5280	0	0	4537	4252	0	0.85	64	28	D
14	Mustang On Ramp Cont.	2		4180	0	1537	4537	4252	0	0.85	64	28	D
15	Patrick Off Ramp	2		2680	0	0	3000	4252	0	0.56	70	17	B
16	Patrick On Ramp	2		17724	340	1181	3340	4252	0	0.64	70	19.5	C
17	USA Parkway Off Ramp	2		2220	0	0	2159	4252	0	0.41	70	12.6	B
18	USA Parkway On Ramp	2		10560	466	0	2625	4252	0	0.52	70	15.9	B
19	USA Parkway On Ramp Cont.	2		8976	0	40	2625	4022	0	0.55	70	15.9	B
20	Derby Off Ramp	2		2020	0	0	2585	4022	0	0.54	70	15.6	B
21	Derby On Ramp	2		8980	15	40	2600	4022	0	0.55	70	15.8	B
22	Orchard Off Ramp	2		1750	0	0	2560	4022	0	0.54	70	15.5	B
23	Orchard On Ramp	2		4320	15	40	2575	4022	0	0.54	70	15.6	B
24	Painted Rock Off Ramp	2		1800	0	0	2535	4022	0	0.54	70	15.4	B
25	Painted Rock On Ramp	2		17610	20	103	2555	4022	0	0.54	70	15.5	B
26	Wadsworth Off Ramp	2		2640	0	0	2452	4022	0	0.52	70	14.9	B
27	Wadsworth On Ramp	2		2640	62	2514	2514	4022	0	0.53	70	15.3	B

Table 12. 25 Years Westbound Freeway Capacity Analysis **I-80 East**

Segment	Location	Mainline Lanes	Ramp Lanes	Section Length	O-D Demands			Section Capacity	Congestion Length	V/C Ratio	Speed MPH	Density VPMPL	LOS
					Origin	Destination	Section						
1	Beginning Segment	2		2640	2530	68	2530	4022	0	0.63	65	19.5	C
2	Wadsworth Off Ramp	2		2290	0	0	2462	4022	0	0.61	65	18.9	C
3	Wadsworth On Ramp	2		17900	152	13	2614	4022	0	0.65	65	20.1	C
4	Painted Rock Off Ramp	2		2340	0	0	2601	4022	0	0.65	65	20	C
5	Painted Rock On Ramp	2		4340	19	11	2620	4022	0	0.65	65	20.2	C
6	Orchard Off Ramp	2		1710	0	0	2609	4022	0	0.65	65	20.1	C
7	Orchard On Ramp	2		8730	16	12	2625	4022	0	0.65	65	20.2	C
8	Derby Off Ramp	2		2430	0	0	2613	4022	0	0.65	65	20.1	C
9	Derby On Ramp	2		19800	15	510	2628	4022	0	0.65	65	20.2	C
10	USA Parkway Off Ramp	2		2800	0	0	2118	4022	0	0.53	65	16.3	B
11	USA Parkway On Ramp	2		23130	1167	290	3285	4356	0	0.75	64	25.6	C
12	Patrick Off Ramp	2		890	0	0	2995	4356	672	0.54	55	21.4	F
13	Patrick On Ramp	2		3060	1553	0	4548	4356	3060	0.85	43	43.3	F
14	Patrick On Ramp Cont.	2		5280	0	0	4548	4356	5280	0.85	34	54.1	F
15	Patrick On Ramp Cont.	2		12032	0	40	4548	4356	12032	0.85	24	78.4	F
16	Mustang Off Ramp	2		3080	0	0	4508	4356	3080	0.84	18	103.9	F
17	Mustang On Ramp	2		6860	929	155	5437	4356	0	1	52	41.7	E
18	Lockwood Off Ramp	2		1175	0	0	5282	4356	0	0.97	55	38.8	E
19	Lockwood On Ramp	2		6200	1093	0	6375	6534	0	0.81	63	28.3	D
20	Vista Off Ramp	2		2250	0	1775	4620	4356	0	0.89	60	32.2	D
21	Vista On Ramp	3		350	1425	0	6045	6534	0	0.81	63	28	D
22	Vista On Ramp Cont	2		1100	0	0	6045	6534	0	0.81	63	28	D
23	Vista On Ramp Cont	3		620	0	552	6045	6534	0	0.81	63	28	D
24	Sparks Off Ramp	2		3050	0	0	5493	6534	0	0.73	64	24.9	C
25	Sparks On Ramp	3		450	1165	0	6658	6534	0	0.91	58	34	D
26	Sparks On Ramp Cont.	2		2640	0	1388	6658	6534	0	0.91	58	34	D
27	McCarran Off Ramp	2		1375	0	0	5270	6534	0	0.72	65	24.4	C
28	McCarran On Loop Ramp	3		350	581	0	5851	6534	0	0.81	63	28.2	D
29	McCarran On Loop Ramp Cont.	2		1400	0	0	5851	6534	0	0.81	63	28.2	D
30	McCarran On Ramp	3		2640	743	6594	6594	6534	0	0.93	58	34.9	D

APPENDIX 6-E

Table of Contents

Table of Contents i
Mainline and Interchange Terminal Analysis - West I-80 Corridor 1
West Verdi Interchange (Exit 2) 1
West Verdi Interchange (Exit 2) 2
Mainline between West Verdi and Verdi Interchange 3
Verdi Interchange (Exit 3) 4
Verdi Interchange (Exit 3) 5
Mainline between Verdi and Garson 6
Garson Interchange (Exit 4) 7
Garson Interchange (Exit 4) 8
Mainline between Garson and East Verdi Interchange 9
East Verdi Interchange (Exit 5) 10
Mainline between East Verdi and Mogul Interchange 11
Mogul Interchange (Exit 7) 12
Mogul Interchange (Exit 7) 13
Mainline between Mogul and West 4th Street Interchange 14
West 4th Street Interchange (Exit 8) 15
West 4th Street Interchange (Exit 8) 16
Mainline between West 4th Street and Robb Drive Interchange 17
Robb Drive Interchange (Exit 9) 18
Robb Drive Interchange (Exit 9) 19
Mainline between Robb Drive and East McCarran Interchange 20
West McCarran Interchange (Exit 10) 21
West McCarran Interchange (Exit 10) 22
Mainline between Robb Drive and West McCarran Interchange 23
Mainline west of East McCarran Interchange 24
Mainline between East McCarran Interchange Ramps 27
Mainline between East McCarran and Sparks Interchange 29
Mainline between Sparks Interchange Ramps 33
Mainline between Sparks and Vista Interchange 34
Mainline between Vista Interchange Ramps 37
Mainline between Vista and Lockwood Interchange 38
Mainline between Lockwood Interchange Ramps 39
Mainline between Lockwood and Mustang Interchange 42

Mainline and Interchange Terminal Analysis

Interchange Terminal	0-2 year	2-7 year	7-15 year	15-25 year	Additional Considerations
W. Verdi Interchange (Exit 2)			🔴	🔵	
I-80 WB terminal	🟢	🟠🟡			
I-80 EB terminal	🟢	🟡			
Mainline between interchanges		🔵			
Verdi Interchange (Exit 3)		🟡🔵			
I-80 WB terminal					
I-80 EB terminal	🟢				
Mainline between interchanges		🔵		🟠	
Garson Interchange (Exit 4)			🔴	🔵	
I-80 WB terminal			🟠		
I-80 EB terminal		🟠🟡			
Mainline between Garson ramps				🟠	
Mainline between interchanges		🔵		🟠	
East Verdi Interchange (Exit 5)		🔵			
I-80 WB terminal					
I-80 EB terminal					
Mainline between interchanges		🔵		🟠	
Mogul Interchange (Exit 7)		🔵	🔴		
I-80 WB terminal	🟠	🟡			
I-80 EB terminal		🟢🟡			
Mainline between ramps				🟠	
Mainline between interchanges				🟠	

Interchange Terminal	0-2 year	2-7 year	7-15 year	15-25 year	Additional Considerations
West 4th Street Interchange (Exit 8)		🟢🔵			
I-80 WB terminal		🟢			
I-80 EB terminal		🟡			
Mainline between interchanges			🔵	🟠	
Robb Interchange (Exit 9)					
I-80 WB terminal		🟢🟠🟡			
I-80 EB terminal			🟡🟠		
Mainline between ramps				🟠*	* *Additional lane recommended to provide continuity*
Mainline between interchanges				🟠	
West McCarran Interchange (Exit 10)		🔵🔴		🔵	
I-80 WB terminal		🟠			
I-80 EB terminal		🟠			
Mainline between ramps					
Mainline east of interchange				🟠	
Urban Area					
Mainline West of Interchange				🟠	
East McCarran Interchange (Exit 19)	🟠*	🟠🟢		🔵	Evaluate roundabout alternative
I-80 WB terminal	🟠*	🟠🟢			
I-80 EB terminal	🟠*	🟠🟢			
Mainline between ramps		🟠*	🟠		Additional lane between on-ramps
Mainline between interchanges	🟠	🟠		🟠	
Sparks Boulevard Interchange (Exit 20)				🔵	
I-80 WB terminal		🟠			

Interchange Terminal	0-2 year	2-7 year	7-15 year	15-25 year	Additional Considerations
I-80 EB terminal	●		●		
Mainline between ramps			●		
Mainline between interchanges			●		
Vista Boulevard Interchange (Exit 21)					
I-80 WB terminal	●		●	●*	Two lane off-ramp needed.
I-80 EB terminal	●	●	●	●*	Two lane on-ramp needed with 2 parallel acceleration lanes.
Mainline between ramps				●	
Mainline between interchanges			●		
Lockwood Interchange (Exit 22)		●●●	●*		Upon development reconstruct ramp terminal
I-80 WB terminal		●●●			
I-80 EB terminal		●●●			
Mainline between ramps				●	
Mainline between interchanges				●	
Mustang Interchange (Exit 23)		●			
I-80 WB terminal					
I-80 EB terminal					
Mainline between ramps				●	
Mainline between interchanges				●	
Patrick Interchange (Exit 28)		●●	●*		Upon development reconstruct ramp terminal
I-80 WB terminal		●●			
I-80 EB terminal		●●			
Mainline		●			
USA Parkway Interchange (Exit 33)			●*		Upon development reconstruct the north side of ramp terminal to connect to the arterial network
I-80 WB terminal					

Interchange Terminal	0-2 year	2-7 year	7-15 year	15-25 year	Additional Considerations
I-80 EB terminal					
Mainline					
Derby Dam Interchange (Exit 36)			●		
I-80 WB terminal					
I-80 EB terminal					
Mainline					
Orchard Interchange (Exit 38)		●			
I-80 WB terminal					
I-80 EB terminal					
Mainline					
Painted Rock Interchange (Exit 40)					
I-80 WB terminal					
I-80 EB terminal					
Mainline		●			
Wadsworth Interchange (Exit 43)		●			
I-80 WB terminal					
I-80 EB terminal					

Legend:

- ● Operations Improvements
- ● Safety Improvements
- ● Connectivity Improvements
- ● Bridge Improvements
- ● Full interchange improvement or modification

West Verdi Interchange (Exit 2)

Interchange Type: Split Diamond
Terminal: I-80 Westbound
Existing Control:
Golden Ranch Road movements are stop controlled. The westbound off-ramp movements are not controlled and consist of one channelized right turn movement and a through left movement.

Ramp Length: 225 feet from the freeway gore.

Deceleration Lane Length: 200 feet

West Verdi Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The freeway's WB off-ramp volume is expected to be higher that 700vph by the 7 year horizon. This high volume is expected to back up into the freeway and deteriorate the freeway operations.
Safety:	The Westbound off-ramp includes a channelized right turn movement that merges into a one lane road. The merge area does not include a tapered distance or a merge lane. The increase in both through traffic and right turn traffic increases the potential for crashes at this location.
Connectivity:	The area east of I-80 is planned to be developed as a special planning area. Once this area starts developing, the I-80 with the existing configuration will accommodate the Eastbound movements only.
Structures Service Life:	N/A
Recommended Solution:	1. Early action safety improvements to eliminate the conflict point for the right turn movement on the WB off-ramp 2. Reconstruct terminal to provide connectivity for new developments and improve operations. Consider roundabout. (2-7 year horizon)

[1]

[1] Photo courtesy of Google Earth.

West Verdi Interchange (Exit 2)

Interchange Type: Split Diamond
Terminal: I-80 Eastbound
Existing Control: Not Controlled. The Eastbound on-ramp terminal includes a channelized southbound right turn, a southbound through, a northbound left turn and northbound through movement. The southbound right turn and northbound left turn merge into one lane ramp.

Ramp Length: 250 feet from the freeway gore.

Parallel Acceleration Lane Length: 250 feet

West Verdi Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	If minor safety improvements are undertaken at the terminal the service life can be extended significantly. Controlling the north and south leg will cause the intersection to operate acceptably through 15 year horizon. The increasing volume on the southbound right turn movement may create operational deficiencies into the arterial.
Safety:	The intersection includes two major conflict points, the southbound through and northbound left and the southbound right and northbound right. The increase in traffic may increase the potential for crashes at this location.
Connectivity:	The area east of I-80 is planned to be developed as a special planning area. Once this area starts developing, the I-80 and the surrounding arterial network with the existing configuration will not accommodate the Westbound movements.
Structures Service Life:	Design Life 2025
Recommended Solution:	1. Early action safety improvements to eliminate the conflict points for the SB right, SB through and NB left turn movement on the EB on-ramp terminal. 2. Interchange reconstruction or modification to provide connectivity for the new developments and improve arterial operations. Consider Roundabout.(15-25 year horizon)

Mainline between West Verdi and Verdi Interchange

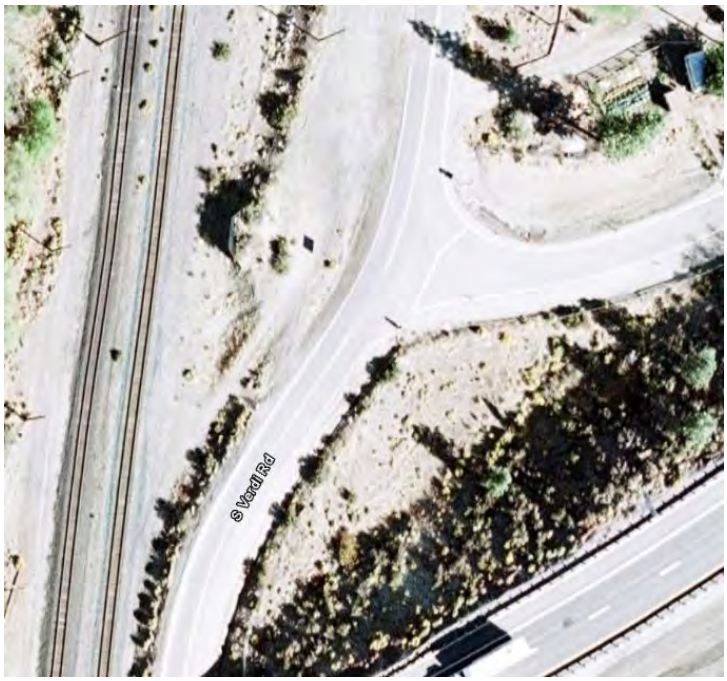
Issues and Recommended Solutions	
Operations:	
Safety:	Provide parallel acceleration lane for Verdi on-ramp. Provide a deceleration lane for West Verdi off-ramp.
Connectivity:	
Structures Service Life:	Design Life 2012
Recommended Solution:	

Verdi Interchange (Exit 3)

Interchange Type: Modified Split Diamond

Terminal: I-80 Westbound

Existing Control: Stop Controlled Westbound off-ramp



Verdi Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	None
Safety:	None
Connectivity:	Area South of the interchange is expected to be developed as a Special Planning Area. A long out of direction travel will be needed for the trips that have their origin or destination west of the area.
Structures Service Life:	Design Life 2012
Recommended Solution:	1. Connectivity to the west needs to be provided for the area south of the interchange.

[1]

[1] Photos Courtesy of Google Earth

Verdi Interchange (Exit 3)

Interchange Type: Modified Split Diamond

Terminal: I-80 Eastbound

Existing Control: Not Controlled

Verdi Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	Minor improvements that will address safety issues will also improve the operations beyond the 25 year horizon.
Safety:	Conflict points between the northbound movements and southbound left turn movement may result in increase the potential for crashes at this location.
Connectivity:	Area South of the interchange is expected to be developed as a Special Planning Area. A long out of direction travel will be needed for the trips that have their origin or destination west of the area.
Structures Service Life:	Design Life 2012
Recommended Solution:	1. Safety improvements recommended at this terminal. 2. Connectivity to the west needs to be provided for the area south of the interchange.

[1]

[1] Photos Courtesy of Google Earth

Mainline between Verdi and Garson

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 25 year horizon.
Safety:	Provide parallel acceleration lane at Garson.
Connectivity:	
Structures Service Life:	Design Life 2014
Recommended Solution:	1. Add an auxiliary lane on both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct auxiliary lanes from Verdi to Garson Interchange
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 100% chance that the estimated timeline for improvements will be in 25 year horizon.
Events that would impact the estimated timeline ▪ Modifications on the adopted land use ▪ Higher external traffic ▪ Lower external traffic ▪ Higher development rate ▪ Lower development rate	

Garson Interchange (Exit 4)

Interchange Type: Modified Diamond with Westbound Hook Ramps

Terminal: I-80 Westbound

Existing Control: Stop Controlled or Yield Control Roundabout

Garson Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The operations at the intersection will fail between 15 and 25 year horizon.
Safety:	
Connectivity:	Out of direction travel is required for the Westbound I-80 trips.
Structures Service Life:	Sufficiency Rating 65. Depending on the deterioration rate the bridge replacement may be required between 2-7 years horizon
Recommended Solution:	1. Interchange terminal reconstruction or modification.(15-25 years horizon). 2. Interchange terminal reconstruction or modification if the bridge becomes eligible for replacement. (2-7 years horizon).

[1]

[1] Photos Courtesy of Google Earth

Garson Interchange (Exit 4)

Interchange Type: Modified Diamond with Westbound Hook Ramps

Terminal: I-80 Eastbound

Existing Control: Stop Controlled

Garson Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The operations at the intersection will fail between 7 and 15 year horizon
Safety:	Arterial network alignment is confusing and may increase the potential for crashes.
Connectivity:	The connectivity to the areas south of I-80 is limited.
Structures Service Life:	Design Life 2025
Recommended Solution:	1. Eastbound ramp terminal intersection improvements. (7-15 years or as development occurs).

[1]

[1] Photos Courtesy of Google Earth

Mainline between Garson and East Verdi Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 25 year horizon.
Safety:	Provide parallel acceleration lane at East Verdi.
Connectivity:	
Structures Service Life:	Design Life 2014
Recommended Solution:	1. Add a general purpose lane in both directions of this freeway segment. Improvement will involve major structure widening.

Risk Assessment	
Project Description:	Construct one general purpose lane from East Verdi to Garson Interchange
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 100% chance that the estimated timeline for improvements will be in 25 year horizon.
Events that would impact the estimated timeline ▪ Modifications on the adopted land use ▪ Higher external traffic ▪ Lower external traffic ▪ Higher development rate ▪ Lower development rate	

East Verdi Interchange (Exit 5)

Interchange Type: Modified Half Diamond to the East

Terminal: I-80 Eastbound

Existing Control: Yield Control Rural Roundabout (not pictured)

East Verdi Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	None
Safety:	None
Connectivity:	This interchange does not provide access for trips going west of this location.
Structures Service Life:	Design Life 2014
Recommended Solution:	None

[1]

[1] Photos Courtesy of Google Earth

Mainline between East Verdi and Mogul Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 25 year horizon.
Safety:	Provide parallel acceleration lane at Mogul
Connectivity:	
Structures Service Life:	Design Life 2014
Recommended Solution:	1. Add a general purpose lane in both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct one general purpose lane East Verdi to Mogul Interchange
Project Schedule:	By 25 year Horizon.
Risk Analysis Results:	See Figure XX -_____
Best Timeline Range:	There is 100% chance that the estimated timeline for improvements will be in 25 year horizon.

Events that would impact the estimated timeline

- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

Mogul Interchange (Exit 7)

Interchange Type: Modified Trumpet

Terminal: I-80 Westbound

Existing Control: Stop Controlled

Mogul Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	Intersection operations are expected to fail between 7 and 15 year horizon. Intersection modifications are needed to provide storage for the southbound and eastbound left turn movements before 7 year horizon.
Safety:	
Connectivity:	The proximity of the railroad and Truckee River to the I-80 is a challenge for improving the connectivity with the areas south of the freeway. If this area will be developed in the future a reconfiguration of the exiting arterial network or new roadways may be required to improve the connectivity as well as the terminal layout.
Structures Service Life:	N/A
Recommended Solution:	1. Reconfigure intersection to accommodate storage, connectivity and safety. (2-7 year horizon). 2. Interchange reconstruction or modification.(7-15 year horizon)

Mogul Interchange (Exit 7)

Interchange Type: Modified Trumpet

Terminal: I-80 Eastbound

Existing Control: Stop Controlled

Mogul Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	Intersection operations are expected to fail between 7 and 15 year horizon. Limited storage on the channelized right turn from the Eastbound off-ramp may cause queuing on the ramp.
Safety:	The skewed layout of the intersection creates visibility issues for the off-ramp traffic. The increase in traffic may increase the potential for crashes at this terminal.
Connectivity:	The proximity of the railroad and Truckee River to the I-80 is a challenge for improving the connectivity with the areas south of the freeway. If this area will be developed in the future a reconfiguration of the exiting arterial network or new roadways may be required to improve the connectivity as well as the terminal layout.
Structures Service Life:	Design Life 2014
Recommended Solution:	1. Reconfigure intersection to accommodate storage, connectivity and safety. (2-7 year horizon). 2. Interchange reconstruction or modification.(7-15 year horizon).

Mainline between Mogul and West 4th Street Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 25 year horizon.
Safety:	Provide parallel acceleration lane at West 4th Street
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane in both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct a general purpose lane between Mogul and West 4th Street Interchange.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 100% chance that the estimated timeline for improvements will be in 25 year horizon.

Events that would impact the estimated timeline

- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

West 4th Street Interchange (Exit 8)

Interchange Type: Half Diamond to the West

Terminal: I-80 Westbound

Existing Control: Stop Controlled

West 4th Street Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	
Safety:	The skewed alignment of 4th Street creates a crossing conflict that typically results in angle or head-on crashes. The increase in traffic may increase the potential for crashes at this location
Connectivity:	This interchange provides access to traffic that will be traveling west of the area. The development that is planned to occur north and south of this interchange has to use the adjacent interchanges to travel east of the area. Currently there is neither development nor network in place.
Structures Service Life:	N/A
Recommended Solution:	1. Terminal modifications of improvements need to be performed to improve the safety at this location.(Early Action)

[1]

[1] Photos Courtesy of Google Earth

West 4th Street Interchange (Exit 8)

Interchange Type: Half Diamond to the West

Terminal: I-80 Eastbound

Existing Control: Stop Controlled

West 4th Street Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	None
Safety:	None
Connectivity:	This interchange provides access to traffic that will be traveling west of the area. The development that is planned to occur north and south of this interchange has to use the adjacent interchanges to travel east of the area. Currently there is neither development nor network in place.
Structures Service Life:	Design Life 2014
Recommended Solution:	

[1]

[1] Photos Courtesy of Google Earth

Mainline between West 4th Street and Robb Drive Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 25 year horizon.
Safety:	Provide parallel acceleration lane at Robb Drive on ramp westbound.
Connectivity:	
Structures Service Life:	Design Life 2016
Recommended Solution:	1. Add a general purpose lane in both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct a general purpose lane between West 4th Street and Robb Drive Interchange.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 73-78% chance that the estimated timeline for improvements will be in 25 year horizon. There is 27% chance that the estimated timeline will be earlier than the 25 year horizon.

Events that would impact the estimated timeline

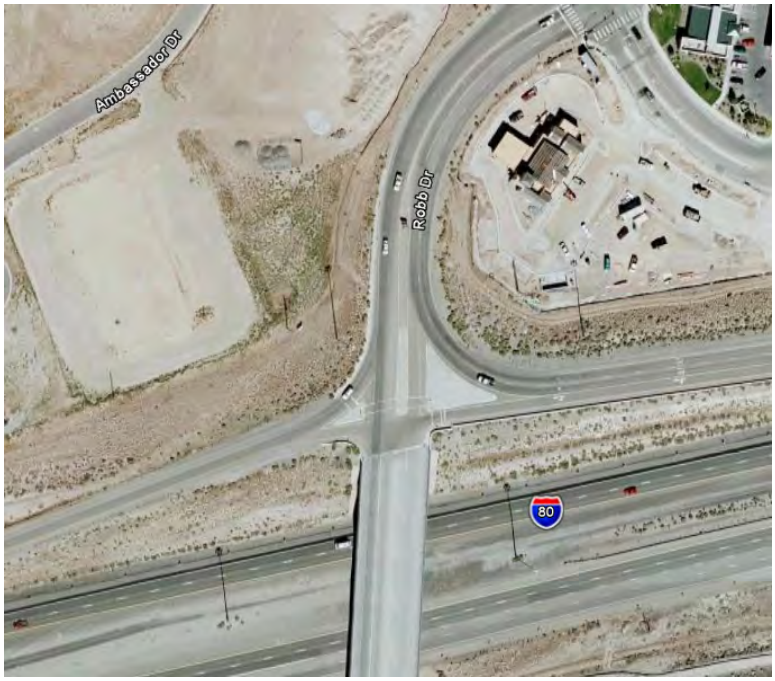
- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

Robb Drive Interchange (Exit 9)

Interchange Type: Modified Diamond with a Loop Ramp

Terminal: I-80 Westbound

Existing Control: Stop Controlled



Robb Drive Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The intersection operations are expected to fail by 7 year horizon.
Safety:	The two channelized right turn lanes from the Westbound off-ramp create a merge conflict point that is associated with sideswipes and rear-end crashes. These types of crashes are very severe. The increase of through traffic in the future will also increate the potential for crashes at this locations.
Connectivity:	The connectivity of the interchange with the development areas south of the interchange is currently missing.
Structures Service Life:	Design Life 2043
Recommended Solution:	1. Capacity and Safety improvements or modification of the interchange. (2-7 year horizon) 2. Arterial network connectivity south of the interchange.

[1]

[1] Photos Courtesy of Google Earth

Robb Drive Interchange (Exit 9)

Interchange Type: Modified Diamond with a Loop Ramp

Terminal: I-80 Eastbound

Existing Control: Stop Controlled

Robb Drive Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	None
Safety:	None
Connectivity:	Current interchange configuration does not provide the areas south of the interchange access to the eastbound I-80.
Structures Service Life:	N/A
Recommended Solution:	1. As the area develops on the south, interchange improvements and/or modification may be required.(2-7 years or when development occurs)

[1]

[1] Photos Courtesy of Google Earth

Mainline between Robb Drive and West McCarran Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at acceptably by the 25 year horizon.
Safety:	Provide parallel acceleration and deceleration lanes at West McCarran.
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	

Risk Assessment	
Project Description:	
Project Schedule:	.
Best Timeline Range:	
Events that would impact the estimated timeline ▪ Modifications on the adopted land use ▪ Higher external traffic ▪ Lower external traffic ▪ Higher development rate ▪ Lower development rate	

West McCarran Interchange (Exit 10)

Interchange Type: Conventional Diamond

Terminal: I-80 Westbound

Existing Control: Traffic Signal Controlled

West McCarran Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The operation at this interchange terminal is currently failing. The terminal does not have sufficient turn movement storage.
Safety:	
Connectivity:	
Structures Service Life:	Design Life 2027
Recommended Solution:	1. Signal retiming may be considered as an early action intervention. 2. Interchange improvement to accommodate the required number of lanes and storage on the arterial and ramps. (2-7 year horizon) 3. Reconstruct bridge structure may be required. (15- 25 year horizon)

[1]

[1] Photos Courtesy of Google Earth

West McCarran Interchange (Exit 10)

Interchange Type: Conventional Diamond

Terminal: I-80 Eastbound

Existing Control: Traffic Signal Controlled

West McCarran Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	The operation at this interchange terminal will fail between 7 and 15 year horizon. The terminal does not have sufficient turn movement storage.
Safety:	
Connectivity:	
Structures Service Life:	Design Life 2027
Recommended Solution:	1. Interchange improvement to accommodate the required number of lanes and storage. (7-15 year horizon) 2. Modification of the existing structures may be required.(15-25 year horizon)

[1]

[1] Photos Courtesy of Google Earth

Mainline East of West McCarran Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 25 year horizon.
Safety:	
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane on the EB direction of this freeway segment.

Risk Assessment	
Project Description:	Construct a general purpose lane east of West McCarran Interchange.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 100% chance that the estimated timeline for improvements will be in 25 year horizon.
Events that would impact the estimated timeline ▪ Modifications on the adopted land use ▪ Higher external traffic ▪ Lower external traffic ▪ Higher development rate ▪ Lower development rate	

Mainline west of East McCarran Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 25 year horizon.
Safety:	Provide parallel acceleration lanes and parallel deceleration lanes
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane on both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct a general purpose lane west of East McCarran Interchange.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 72-77% chance that the estimated timeline for improvements will be in 25 year horizon. There will be 5% chance that the estimated timeline will be earlier than the 25 year horizon. There will be 18-23% chance that the estimated timeline will be later than the 25 year horizon.

Events that would impact the estimated timeline

- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

East McCarran Interchange (Exit 19)

Interchange Type: : Modified Diamond with North to West Loop Ramp
Terminal: I-80 Westbound
Existing Control Westbound off ramp: Signalized

Existing Control Westbound on Ramps: Uncontrolled

Ramp Length:

Deceleration Lane: Tapered

Acceleration Lane Northbound to Westbound: Parallel acceleration lane 320 feet.

East McCarran Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The freeway's WB off-ramp volume may increase in the future due to the developments on the east side of the corridor. If the growth occurs at the anticipated rate the intersection is expected to fail by the 7 year horizon.
Safety:	
Connectivity:	
Structures Service Life:	Design Life 2025
Recommended Solution:	1. Evaluate alternatives for ramp terminal intersection. Investigate additional turn lanes or roundabout. (Early action) 2. Reconstruct intersection terminal. (2-7 years).

[1]

[1] Photo courtesy of Google Earth.

East McCarran Interchange (Exit 19)

Interchange Type: : Modified Diamond with North to West Loop Ramp
Terminal: I-80 Eastbound
Existing Control: Signalized.

WB off ramp length: 250 feet from the freeway gore.

Deceleration length: 250 feet

Acceleration Length: 250 feet

East McCarran Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	Currently this intersection operates at unacceptable Level of Service. Improvements are required at this terminal. The intersection is closely spaced with another signalized intersection south. Any improvement should be considered in conjunction with Nugget Avenue and McCarran intersection.
Safety:	
Connectivity:	
Structures Service Life:	Design Life 2025
Recommended Solution:	1. Evaluate alternatives for ramp terminal intersection. Investigate additional turn lanes or roundabout. (Early action) 2. Reconstruct intersection terminal. Consider additional turn lanes, signal retiming or Roundabout. (2-7 year horizon)

[1]

[1] Photo courtesy of Google Earth.

Mainline between East McCarran Interchange Ramps

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 7 year horizon on the Westbound direction between on-ramps and by the 15 year horizon between off and on ramps in both directions of this freeway segment
Safety:	
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane between two consecutive on-ramps on the westbound direction of this freeway segment by the 7 year horizon. 2. Add a general purpose lane between off and on ramps on both directions of this freeway section by the 15 year horizon.

Risk Assessment	
Project Description:	Construct a general purpose lane between two consecutive on-ramps on the westbound direction.
Project Schedule:	By 7 year Horizon.
Best Timeline Range:	There is 55% chance that the estimated timeline for improvements will be in 7 year horizon. There will be 45% chance that the estimated timeline will be later than the 7 year horizon.
Project Description:	Construct a general purpose lane between on and off ramps of East McCarran Interchange.
Project Schedule:	By 15 year Horizon.
Best Timeline Range:	There is 60-71% chance that the estimated timeline for improvements will be in 15 year horizon. There will be up to 29% chance that the estimated timeline will be earlier than the 15 year horizon. There will be 4% chance that the estimated timeline will be later than the 15 year horizon.

Events that would impact the estimated timeline

- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

Mainline between East McCarran and Sparks Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 7 year horizon.
Safety:	Provide parallel acceleration lanes
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a full auxiliary lane on both directions of this freeway segment in 7 year horizon. 2. Add a full auxiliary lane on both directions of this freeway segment in 25 year horizon.

Risk Assessment	
Project Description:	Construct full auxiliary lanes between East McCarran and Sparks Interchange.
Project Schedule:	By 7 year Horizon.
Best Timeline Range:	There is 78-84% chance that the estimated timeline for improvements will be in 7 year horizon. There will be 16-22% chance that the estimated timeline will be later than the 7 year horizon.
Project Description:	Construct full auxiliary lanes between East McCarran and Sparks Interchange.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 84-89% chance that the estimated timeline for improvements will be in 25 year horizon. There will be 1% chance that the estimated timeline will be earlier than the 25 year horizon. There will be10-15% chance that the estimated timeline will be later than the 25 year horizon.

Events that would impact the estimated timeline

- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

Sparks Interchange (Exit 20)

Interchange Type: Conventional Diamond
Terminal: I-80 Westbound
Existing Control: Signalized

WB on-ramp length: 1500 feet

WB off-ramp length: 1800 feet

Parallel Acceleration Length: 520 feet

Parallel Deceleration Length: 400 feet

Sparks Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	Intersection is expected to fail between 7 and 15 year horizon due to high delay on the northbound left turn movement. However the volume in this movement currently exceeds 300vph on the afternoon peak hour therefore an additional left turn lane is required. Also the southbound right turn movement currently exceeds 800vph during the morning peak therefore a separate storage lane for this movement is required on the arterial to reduce the delay for this movement.
Safety:	None
Connectivity:	
Structures Service Life:	Design Life 2039
Recommended Solution:	1. Intersection improvements; Consider additional turn lanes.(2-7 year horizon), or 2. Interchange reconstruction or modification (2-7 years)

[1]

[1] Photos Courtesy of Google Earth

Sparks Interchange (Exit 20)

Interchange Type: Conventional Diamond
Terminal: I-80 Eastbound
Existing Control: Signalized

EB on-ramp length: 1500 feet

EB off-ramp length: 1700 feet

Sparks Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	Currently the intersection operates at unacceptable level of service. Improvements are required to accommodate the heavy eastbound left turn. Considering a triple left turn will be in place as an early action item the intersection operations are expected to fail between 15 and 25 year horizon due to a heavy southbound left turn movement. This increase in volume for this movement is due to the expected developments on the east side of the corridor. The improvements will become necessary depending on the rate of development on the east.
Safety:	
Connectivity:	
Structures Service Life:	Design Life 2039
Recommended Solution:	1. Improvements to accommodate triple left turn lanes on the eastbound ramp.(0-2 years horizon) 2. Reconstruct eastbound ramp terminal intersection. (15-25 years)

[1]

[1] Photos Courtesy of Google Earth

Mainline between Sparks Interchange Ramps

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 15 year horizon on both directions of this freeway section.
Safety:	
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane on both directions of this freeway segment by the 15 year horizon.

Risk Assessment	
Project Description:	Construct general purpose lanes between Sparks Interchange on and off ramps.
Project Schedule:	By 15 year Horizon.
Best Timeline Range:	There is 59-61% chance that the estimated timeline for improvements will be in 15 year horizon. There will be39-41% chance that the estimated timeline will be later than the 15 year horizon.
Events that would impact the estimated timeline ▪ Modifications on the adopted land use ▪ Higher external traffic ▪ Lower external traffic ▪ Higher development rate ▪ Lower development rate	

Mainline between Sparks and Vista Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 15 year horizon on both directions.
Safety:	Provide parallel acceleration lanes on the westbound and deceleration lanes on the eastbound.
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a full auxiliary lane on both directions of this freeway segment by 15 year horizon.

Risk Assessment	
Project Description:	Construct a full auxiliary lane between Sparks and Vista Interchange.
Project Schedule:	By 15 year Horizon.
Best Timeline Range:	There is 74-77% chance that the estimated timeline for improvements will be in 15 year horizon. There will be23-26% chance that the estimated timeline will be later than the 15 year horizon.
Events that would impact the estimated timeline ▪ Modifications on the adopted land use ▪ Higher external traffic ▪ Lower external traffic ▪ Higher development rate ▪ Lower development rate	

Vista Interchange (Exit 21)

Interchange Type: Conventional Diamond
Terminal: I-80 Westbound

Existing Control: Signalized

WB on-ramp length: 950 feet

WB off-ramp length: 1300 feet

Parallel Acceleration Length: 420 feet

Vista Interchange – I80 Westbound Terminal

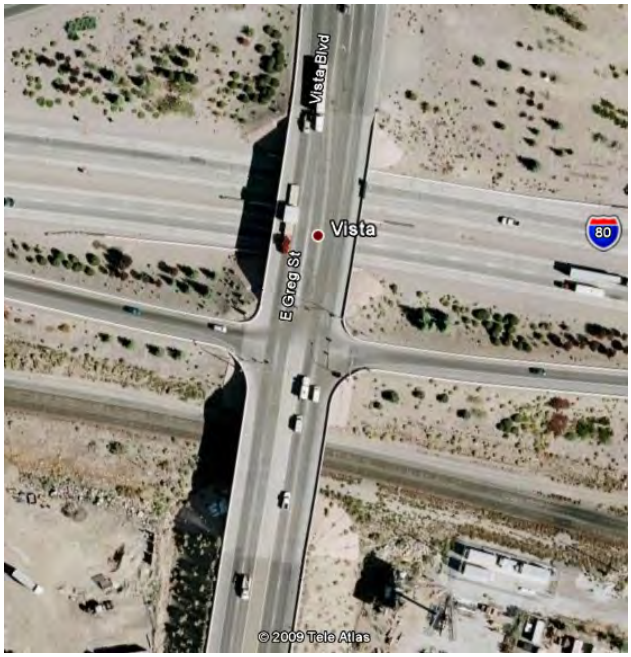
Issues and Recommended Solutions	
Operations:	The operations at the intersection will fail before 7 year horizon due to the heavy southbound right turn movement and the increase in the westbound off-ramp volumes. The V/C ratio for the westbound off-ramp will exceed 0.8 by 25 year horizon.
Safety:	
Connectivity:	
Structures Service Life:	Design Life 2035
Recommended Solution:	1. Intersection improvements that incorporate a free right turn movement, and separate storage lanes to accommodate westbound left and right turn movements on the ramp. (2-7 year horizon) 2. Provide a second lane on the westbound off ramp by 25 year horizon.

[1]

[1] Photos Courtesy of Google Earth

Vista Interchange (Exit 21)

Interchange Type: Conventional Diamond
Terminal: I-80 Eastbound
Existing Control: Stop Controlled



Vista Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	The intersection operations are currently failing due to the heavy EB left turn volume. Improvements are anticipated to occur to provide a triple left on the EB off ramp. The SB left turn volume is expected to increase due to the developments expected on the east side of the corridor. If the growth occurs at the anticipated rate the intersection is expected to fail by the 7 year horizon if a triple left is in place as an early action. The V/C ratio for the eastbound on-ramp will exceed 0.8 by 25 year horizon.
Safety:	
Connectivity:	
Structures Service Life:	Design Life 2035
Recommended Solution:	1. Construct east to north triple left. (Early action or 2-7 year horizon) 2. Construct north to east dual left. (2-7) year horizon or when EB traffic warrants it.) 3. Provide a second lane on the eastbound on-ramp by the 25 year horizon.

[1]

[1] Photos Courtesy of Google Earth

Mainline between Vista Interchange Ramps

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at acceptable level of service by the 25 year horizon on westbound directions. However to provide continuity and account for traffic fluctuations an additional lane is recommended.
Safety:	
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane in both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct general purpose lanes between Vista Interchange on and off ramps.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 68-76% chance that the estimated timeline for improvements will be in 25 year horizon. There will be24-32% chance that the estimated timeline will be later than the 25 year horizon.
Events that would impact the estimated timeline ▪ Modifications on the adopted land use ▪ Higher external traffic ▪ Lower external traffic ▪ Higher development rate ▪ Lower development rate	

Mainline between Vista and Lockwood Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operate at unacceptable level of service by the 15 year horizon on both directions.
Safety:	Provide parallel acceleration and deceleration lanes in both directions.
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane on both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct a general purpose lane between Vista and Lockwood Interchange.
Project Schedule:	By 15 year Horizon.
Best Timeline Range:	There is 59-61% chance that the estimated timeline for improvements will be in 15 year horizon. There will be39-41% chance that the estimated timeline will be later than the 15 year horizon.
Events that would impact the estimated timeline ▪ Modifications on the adopted land use ▪ Higher external traffic ▪ Lower external traffic ▪ Higher development rate ▪ Lower development rate	

Mainline between Lockwood Interchange Ramps

Issues and Recommended Solutions	
Operations:	This freeway segment will operates at unacceptable level of service by the 25 year horizon on both directions.
Safety:	
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane on both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct general purpose lanes between Lockwood Interchange on and off ramps.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 48-79% chance that the estimated timeline for improvements will be in 25 year horizon. There will be21-52% chance that the estimated timeline will be earlier than the 25 year horizon.

Events that would impact the estimated timeline

- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

Lockwood Interchange (Exit 22)

Interchange Type: Modified Diamond with Westbound Hook Ramps

Terminal: I-80 Eastbound

Existing Control: Not Controlled

Lockwood Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	Current interchange terminal configuration does not allow for an evaluation of the future terminal operations. A reconfiguration of the interchange terminal will be required when development north of the interchange will start to occur. The reconfiguration of the terminal will depend on the future planned arterial network.
Safety:	None
Connectivity:	This interchange does not provide access for trips going east of this location.
Structures Service Life:	N/A
Recommended Solution:	If the access will be through another arterial then the future interchange configuration may need to be evaluated in conjunction with the future network and with the westbound terminal. This may result in : 1. Modify the slip ramps to accommodate arterials to the north. Consider roundabout. 2. Proposing a standard diamond interchange. 3. New interchange.

[1]

[1] Photos Courtesy of Google Earth

Lockwood Interchange (Exit 22)

Interchange Type: Modified Diamond with Westbound Hook Ramps

Terminal: I-80 Westbound

Existing Control: Non Controlled

Lockwood Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	The increase in traffic volumes will require changes in the control of the intersection. Assuming the intersection will be all way stop controlled the intersection operations are expected to fail by 15 year horizon.
Safety:	
Connectivity:	
Structures Service Life:	Design Life 2012
Recommended Solution:	Depending on the intensity of the development the following intersection improvements alternatives may be considered: 1. Place Stop Control signs in all legs of the intersection; Provide separate storage lane for the heaviest left turn movements When operations of the stop control intersection deteriorate the following options may be considered: 1. Roundabout 2. Signalized Intersection The arterial network improvements may also lead to interchange terminal improvements.

[1]

[1] Photos Courtesy of Google Earth

Mainline between Lockwood and Mustang Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operates at unacceptable level of service by the 25 year horizon on both directions.
Safety:	
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane on both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct a general purpose lane between Lockwood and Mustang Interchange.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 64-70% chance that the estimated timeline for improvements will be in 25 year horizon. There will be30-36% chance that the estimated timeline will be earlier than the 25 year horizon.

Events that would impact the estimated timeline

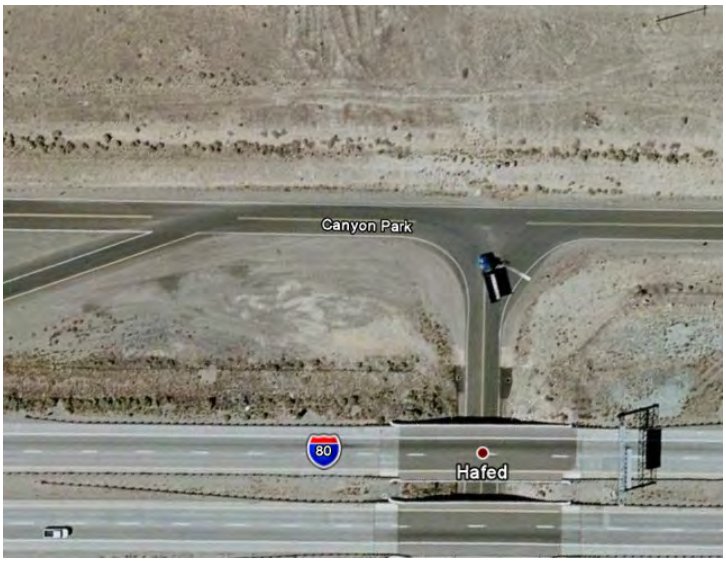
- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

Mustang Interchange (Exit 23)

Interchange Type: Split Diamond

Terminal: I-80 Westbound On

Existing Control: Not Controlled



Mustang Interchange – I80 Westbound On Terminal

Issues and Recommended Solutions	
Operations:	
Safety:	Current terminal is not-controlled. The increase in traffic may increase the potential for crashes at this terminal.
Connectivity:	
Structures Service Life:	Design Life 2012
Recommended Solution:	3. Place a "Yield" sign for the Westbound traffic

[1]

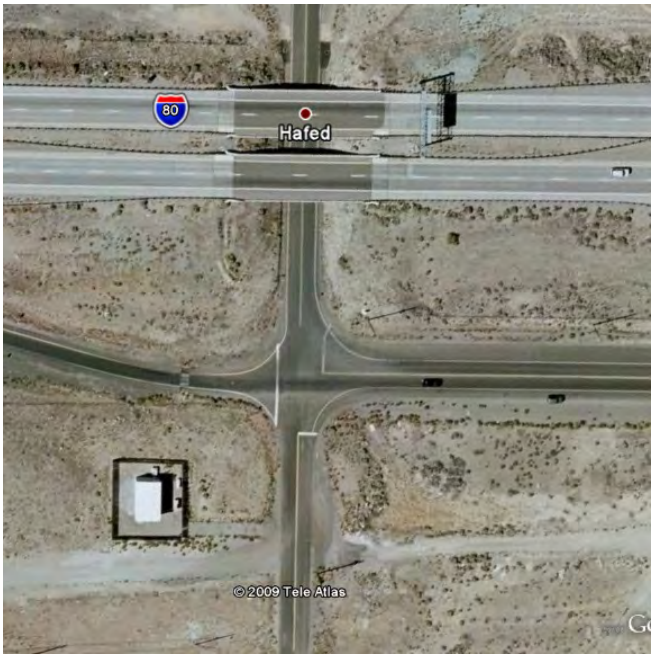
[1] Photos Courtesy of Google Earth

Mustang Interchange (Exit 23)

Interchange Type: Split Diamond

Terminal: I-80 Eastbound Off

Existing Control: Stop Controlled



Mustang Interchange – I80 Eastbound Off Terminal

Issues and Recommended Solutions	
Operations:	The intersection operations are expected to fail between 15 and 25 year horizon.
Safety:	
Connectivity:	
Structures Service Life:	Design Life 2012
Recommended Solution:	2. Provide separate storage lane to the heaviest turn movement which most probably will be on the west leg of the intersection.

[1]

[1] Photos Courtesy of Google Earth

Mustang Interchange (Exit 23)

Interchange Type: Split Diamond

Terminal: I-80 Westbound Off

Existing Control: Stop Controlled

Mustang Interchange – I80 Westbound Off Terminal

Issues and Recommended Solutions	
Operations:	The intersection will operate acceptably through 25 year horizon.
Safety:	None
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	None

[1]

[1] Photos Courtesy of Google Earth

Mustang Interchange (Exit 23)

Interchange Type: Split Diamond

Terminal: I-80 Eastbound On

Existing Control: Stop Controlled

Mustang Interchange – I80 Eastbound On Terminal

Issues and Recommended Solutions	
Operations:	The intersection will operate satisfactorily through 25 year horizon.
Safety:	The eastbound traffic on Mustang Road it is not expected to stop at the intersection with the on ramp. This traffic includes not only the through traffic but the left turn traffic that will use the on ramp. This is a violation of the drivers expectation and may result in angle collisions between the eastbound on-ramp traffic and westbound traffic.
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	3. Convert Yield control sign to Stop control sign on the east leg of the intersection.

[1]

[1] Photos Courtesy of Google Earth

Mainline between Mustang Interchange Ramps

Issues and Recommended Solutions	
Operations:	This freeway segment will operates at unacceptable level of service by the 25 year horizon on both directions.
Safety:	
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane on both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct general purpose lanes between Mustang Interchange on and off ramps.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 92% chance that the estimated timeline for improvements will be in 25 year horizon. There will be 8% chance that the estimated timeline will be later than the 25 year horizon.

Events that would impact the estimated timeline

- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

Mainline between Mustang and Patrick Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operates at unacceptable level of service by the 25 year horizon on both directions.
Safety:	
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. Add a general purpose lane on both directions of this freeway segment.

Risk Assessment	
Project Description:	Construct a general purpose lane between Mustang and Patrick Interchange.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 93% chance that the estimated timeline for improvements will be in 25 year horizon. There will be 7% chance that the estimated timeline will be later than the 25 year horizon.

Events that would impact the estimated timeline

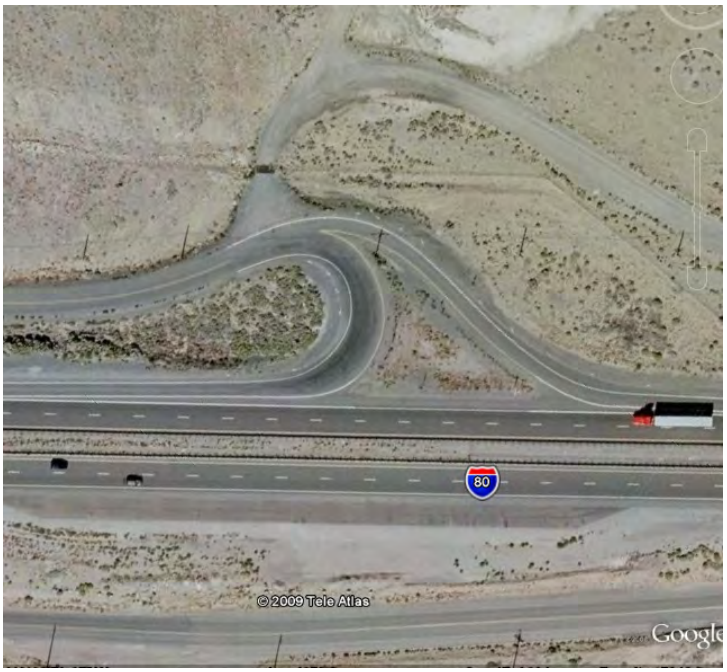
- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

Patrick Interchange (Exit 28)

Interchange Type: Modified Diamond with East- and Westbound Hook Ramps

Terminal: I-80 Westbound

Existing Control: Uncontrolled



Patrick Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	Current interchange terminal configuration does not allow for an evaluation of the future terminal operations. A reconfiguration of the interchange terminal will be required when development north of the interchange will start to occur. The reconfiguration of the terminal will depend on the future planned arterial network.
Safety:	None
Connectivity:	The connectivity to the north of the interchange is provided through Waltham Way. This requires 0.8 miles out of direction travel for the traffic north of the interchange. Additional network may be required to provide connectivity to the planned developments north of the interchange.
Structures Service Life:	N/A
Recommended Solution:	The recommended improvements depend on the intensity of the future development in the area as well as in the future roadway network. 1. If Waltham Way will be the only roadway access for the areas north of the interchange the following improvement options may be taken into consideration: a. Modify the terminal to provide access to the areas north of

Issues and Recommended Solutions	
	the terminal; roundabout may be the most suitable configuration due to the alignment of the Waltham Way with respect to the freeway ramps; reconstruction of the existing freeway ramps. b. Modify the terminal by implementing a different type of control and accommodating movements north of the interchange. 2. If the access will be through another arterial then the future interchange configuration may need to be evaluated in conjunction with the future network and with the westbound terminal. This may result in : a. Maintaining a modified diamond interchange configuration b. Proposing a new type of interchange.

[1]

[1] Photos Courtesy of Google Earth

Patrick Interchange (Exit 28)

Interchange Type: Modified Diamond with East- and Westbound Hook Ramps

Terminal: I-80 Eastbound

Existing Control: Uncontrolled

Patrick Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	The operation at this interchange terminal will fail between 15 and 25 year horizon.
Safety:	
Connectivity:	The connectivity to the north of the interchange is provided through Waltham Way. This requires 0.8 miles out of direction travel for the traffic north of the interchange. Additional network may be required to provide connectivity to the planned developments north of the interchange.
Structures Service Life:	N/A
Recommended Solution:	The recommended improvements depend on the intensity of the future development in the area as well as in the future roadway network. 1. If Waltham Way will be the only roadway access for the areas north of the interchange the following improvement options may be taken into consideration: a. Provide separate lanes for the southbound right turn and through movement; separate lanes for the eastbound left and right turn movement; maintain the same control as existing. b. Roundabout

Issues and Recommended Solutions	
	2. If the access will be through another arterial then the future interchange configuration may need to be evaluated in conjunction with the future network and with the eastbound terminal. This may result in : a. Maintaining a split diamond interchange configuration b. Proposing a new type of interchange.

[1]

[1] Photos Courtesy of Google Earth

Mainline between Patrick and USA Parkway Interchange

Issues and Recommended Solutions	
Operations:	This freeway segment will operates at acceptable level of service by the 25 year horizon on both directions.
Safety:	
Connectivity:	
Structures Service Life:	N/A
Recommended Solution:	1. No Improvements are Required

Risk Assessment	
Project Description:	No Improvements are Required.
Project Schedule:	By 25 year Horizon.
Best Timeline Range:	There is 89-96% chance that the estimated timeline for improvements will be in later than the 25 year horizon. There will be 4-11% chance that improvements may be required by the 25 year horizon.

Events that would impact the estimated timeline

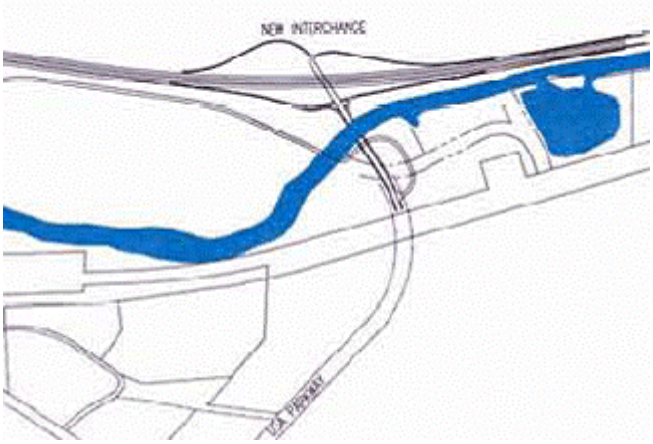
- Modifications on the adopted land use
- Higher external traffic
- Lower external traffic
- Higher development rate
- Lower development rate

USA Parkway Interchange (Exit 33)

Interchange Type: Modified Diamond with North to West Dedicated Free Flow

Terminal: I-80 Westbound

Existing Control: Stop Controlled



USA Parkway Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The terminal is expected to operate acceptably through 25 year horizon.
Safety:	
Connectivity:	There is no connectivity to the areas north of the interchange.
Structures Service Life:	Design Life 2058
Recommended Solution:	None

[1]

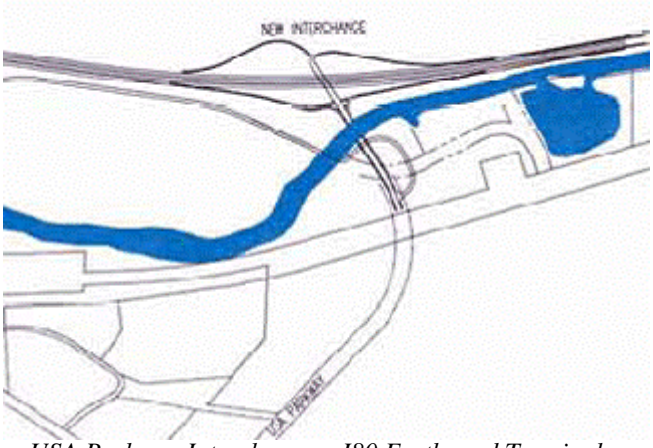
[1] Photos Courtesy of Google Earth

USA Parkway Interchange (Exit 33)

Interchange Type: Modified Diamond with North to West Dedicated Free Flow

Terminal: I-80 Eastbound

Existing Control: Stop Controlled



USA Parkway Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	The terminal is expected to operate acceptably through 25 year horizon.
Safety:	
Connectivity:	There is no connectivity to the areas north of the interchange.
Structures Service Life:	Design Life 2058
Recommended Solution:	None

[1]

[1] Photos Courtesy of Google Earth

Derby Interchange (Exit 36)

Interchange Type: Modified Diamond with Eastbound Frontage Road Ties

Terminal: I-80 Westbound

Existing Control: Stop Controlled

Derby Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The terminal is expected to operate acceptably through 25 year horizon.
Safety:	
Connectivity:	There is no connectivity to the areas north of the interchange and south of Truckee River. However, currently there are no planned developments in the area.
Structures Service Life:	Design Life 2020
Recommended Solution:	None

[1]

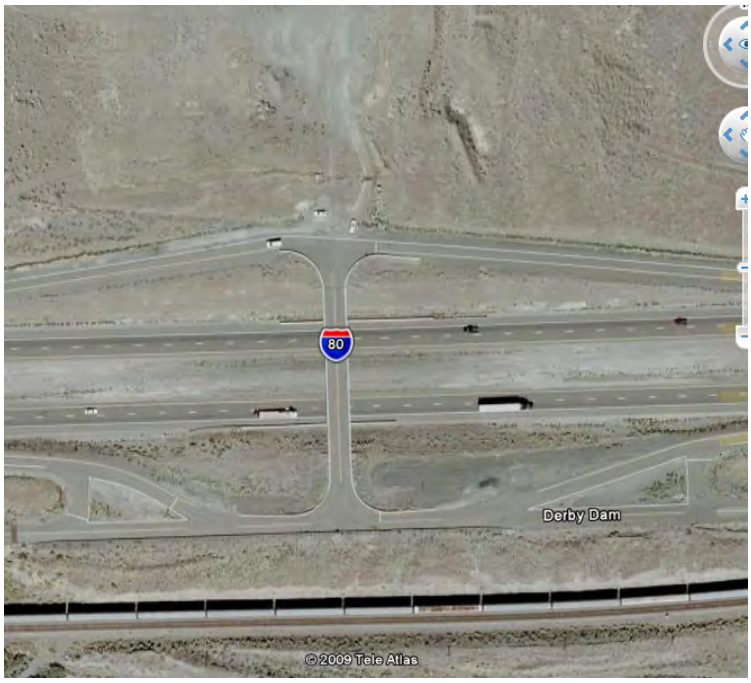
[1] Photos Courtesy of Google Earth

Derby Interchange (Exit 36)

Interchange Type: Modified Diamond with Eastbound Frontage Road Ties

Terminal: I-80 Eastbound

Existing Control: Stop Controlled



Derby Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	The terminal is expected to operate acceptably through 25 year horizon.
Safety:	
Connectivity:	There is no connectivity to the areas north of the interchange and south of Truckee River. However, currently there are no planned developments in the area.
Structures Service Life:	Design Life 2020
Recommended Solution:	None.

[1]

[1] Photos Courtesy of Google Earth

Orchard Interchange (Exit 38)

Interchange Type: Conventional Diamond

Terminal: I-80 Eastbound

Existing Control: Stop Controlled

Orchard Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The terminal is expected to operate acceptably through 25 year horizon.
Safety:	
Connectivity:	There are no developments or planned development north or south of the interchange. The connectivity to the south is hindered by the railroad and Truckee River.
Structures Service Life:	Design Life 2008
Recommended Solution:	None

[1]

[1] Photos Courtesy of Google Earth

Orchard Interchange (Exit 38)

Interchange Type: Conventional Diamond

Terminal: I-80 Eastbound

Existing Control: Stop Controlled

Orchard Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	The terminal is expected to operate acceptably through 25 year horizon.
Safety:	
Connectivity:	There are no developments or planned development north or south of the interchange. The connectivity to the south is hindered by the railroad and Truckee River.
Structures Service Life:	Design Life 2008
Recommended Solution:	None

[1]

[1] Photos Courtesy of Google Earth

Painted Rock Interchange (Exit 40)

Interchange Type: Conventional Diamond

Terminal: I-80 Westbound

Existing Control: Stop Controlled

Painted Rock Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The terminal is expected to operate acceptably through 25 year horizon.
Safety:	
Connectivity:	There are no developments or planned development north of the interchange. The planned developments south of the interchange will not be connected to the interchange based on Storey County information
Structures Service Life:	N/A
Recommended Solution:	None

[1]

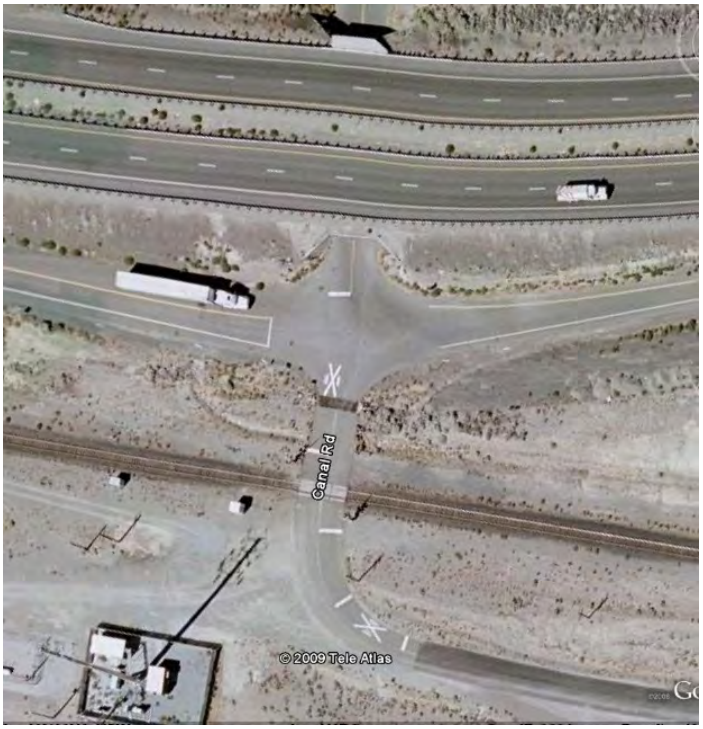
[1] Photos Courtesy of Google Earth

Painted Rock Interchange (Exit 40)

Interchange Type: Conventional Diamond

Terminal: I-80 Westbound

Existing Control: Stop Controlled



Painted Rock Interchange – I80 Eastbound Terminal

Issues and Recommended Solutions	
Operations:	The terminal is expected to operate acceptably through 25 year horizon.
Safety:	
Connectivity:	There are no developments or planned development north of the interchange. The planned developments south of the interchange will not be connected to the interchange based on Storey County information
Structures Service Life:	N/A
Recommended Solution:	None

[1]

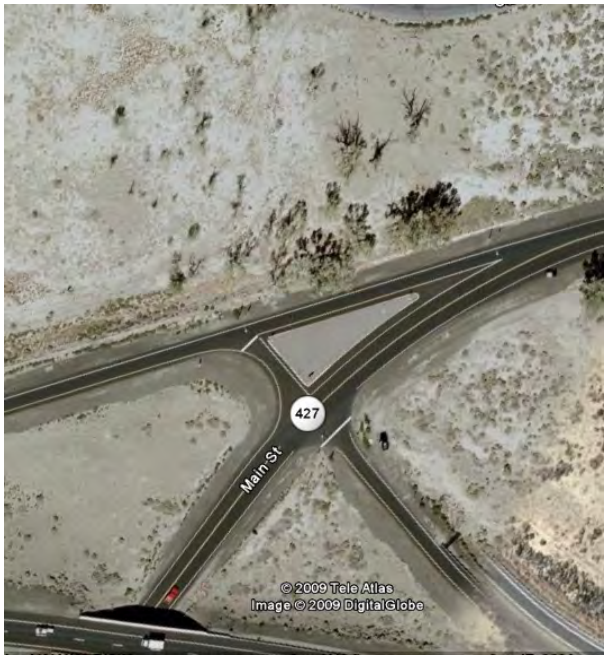
[1] Photos Courtesy of Google Earth

Wadsworth Interchange (Exit 43)

Interchange Type: Modified Diamond

Terminal: I-80 Westbound

Existing Control: Stop Controlled



Wadsworth Interchange – I80 Westbound Terminal

Issues and Recommended Solutions	
Operations:	The terminal is expected to operate acceptably through 25 year horizon.
Safety:	
Connectivity:	
Structures Service Life:	Design Life to 2013
Recommended Solution:	None

[1]

[1] Photos Courtesy of Google Earth

Wadsworth Interchange (Exit 43)

Interchange Type: Conventional Diamond with Modified Westbound Ramp Terminal

Terminal: I-80 Eastbound

Existing Control: Stop Controlled

Wadsworth Interchange – I80 Eastbound Terminal

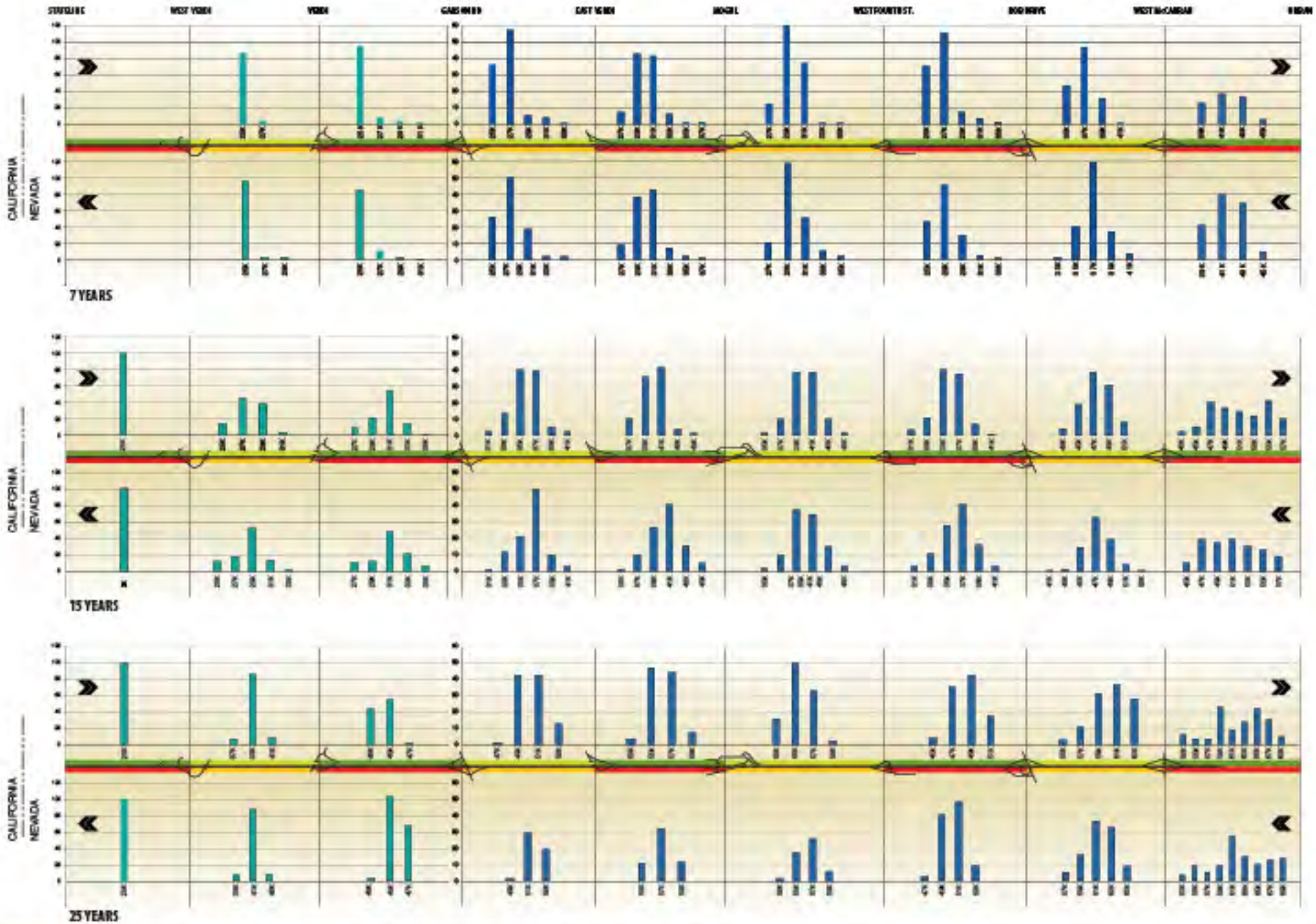
Issues and Recommended Solutions	
Operations:	The terminal is expected to operate acceptably through 25 year horizon.
Safety:	
Connectivity:	
Structures Service Life:	Design Life to 2013
Recommended Solution:	None

[1]

[1] Photos Courtesy of Google Earth

FIGURE 6-1

I-80 CORRIDOR WEST - INTERCHANGES



I-80 CORRIDOR EAST - INTERCHANGES

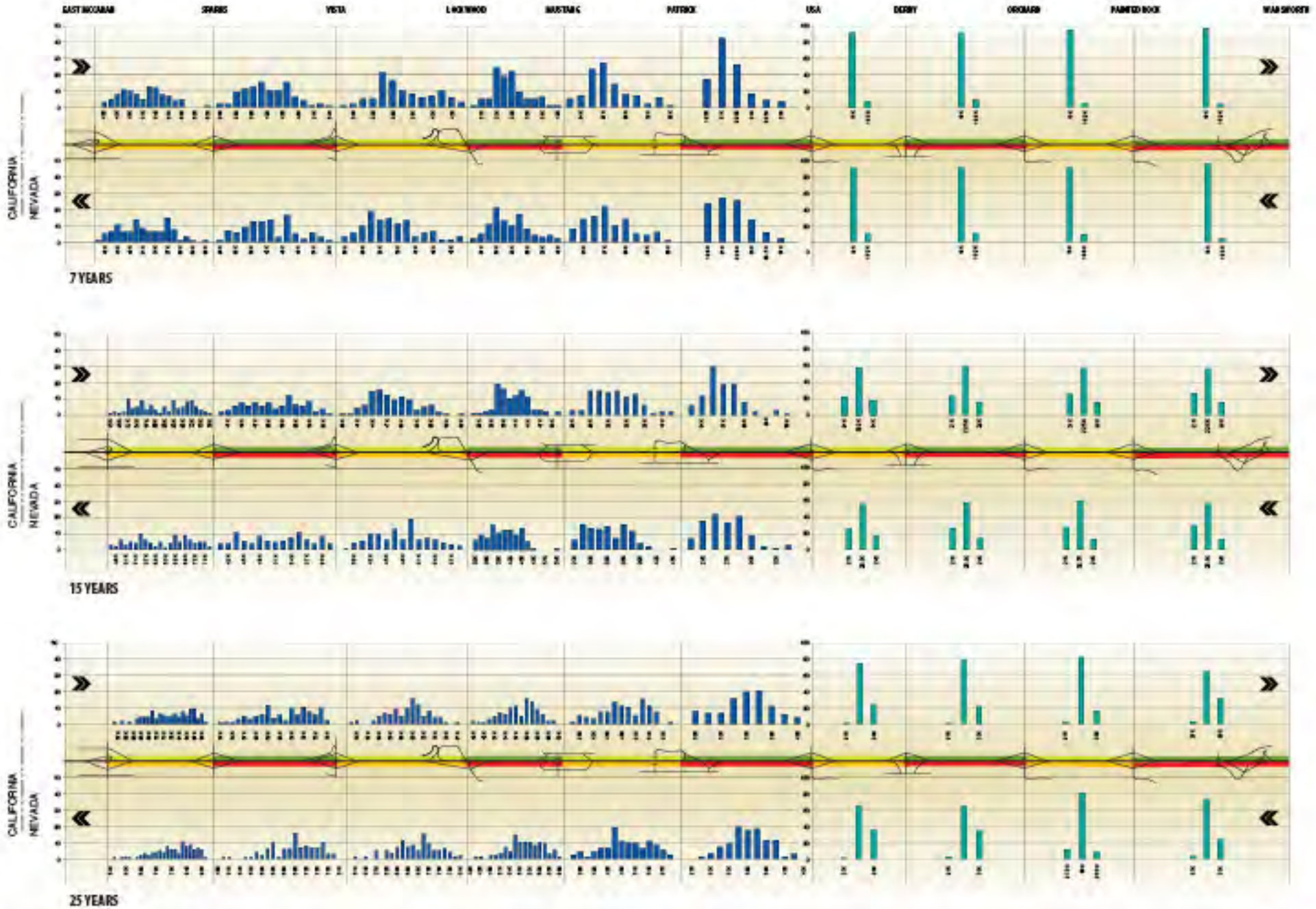


Table 1. AADT Impact Threshold I-80 West Eastbound

Horizon Year		7 year				15 year				25 year			
Segment	Location	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range
1	Beginning Segment	2011	1802	0.105	17162	2011	1802	0.105	17162	2011	1802	0.105	17162
2	West Verdi Off	2011	1802	0.105	17162	2011	1802	0.105	17162	2011	1802	0.105	17162
3	West Verdi On	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
4	West Verdi On Cont.	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
5	Verdi On	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
6	Garson Off	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
7	Garson On	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
8	East Verdi On Acceleration	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
9	East Verdi On	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
10	Mogul Off	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
11	Mogul On Acceleration	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
12	Mogul On	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
13	West 4th Off	2011	1802	0.09	20022	2011	1802	0.09	20022	2011	1802	0.09	20022
14	Robb Drive Off	2178	1937	0.08	24213	2178	1937	0.08	24213	2178	1937	0.08	24213
15	Robb Drive On Acceleration	2178	1937	0.08	24213	2178	1937	0.08	24213	2178	1937	0.08	24213
16	Rob Drive On Cont	2178	1937	0.08	24213	2178	1937	0.08	24213	2178	1937	0.08	24213
17	West McCarran Off	2178	1937	0.08	24213	2178	1937	0.08	24213	2178	1937	0.08	24213
18	West McCarran On	2178	1937	0.08	24213	2178	1937	0.08	24213	2178	1937	0.08	24213

Table 2. AADT Impact Threshold I-80 West Westbound

Horizon Year		7 year				15 year				25 year			
Segment	Location	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range
1	Beginning Segment	2178	1937	0.08	24213	2178	1937	0.08	24213	2178	1937	0.08	24213
2	West McCarran Off	2178	1937	0.08	24213	2178	1937	0.08	24213	2178	1937	0.08	24213
3	West McCarran On	2178	1937	0.08	24213	2178	1937	0.08	24213	2178	1937	0.08	24213
4	Robb Drive Off	2178	1937	0.08	24213	2178	1937	0.08	24213	2178	1937	0.08	24213
5	Robb Drive On, Acceleration	2060	1846	0.08	23075	2060	1846	0.08	23075	2060	1846	0.08	23075
6	Robb Drive On cont	2060	1846	0.09	20511	2060	1846	0.09	20511	2060	1846	0.09	20511
7	West 4th Street On, Accelera	2060	1846	0.09	20511	2060	1846	0.09	20511	2060	1846	0.09	20511
8	West 4th Street On cont	2060	1846	0.09	20511	2060	1846	0.09	20511	2060	1846	0.09	20511
9	Exit 7, Mogul Off Ramp	2060	1846	0.09	20511	2060	1846	0.09	20511	2060	1846	0.09	20511
10	Mogul On, Acceleration	2060	1846	0.09	20511	2060	1846	0.09	20511	2060	1846	0.09	20511
11	Mogul On cont	2060	1846	0.09	20511	2060	1846	0.09	20511	2060	1846	0.09	20511
12	Exit 5, East Verdi Off Ramp	2060	1846	0.09	20511	2060	1846	0.09	20511	2060	1846	0.09	20511
13	Exit 4, Garson Off Ramp	2060	1846	0.09	20511	2060	1846	0.09	20511	2060	1846	0.09	20511
14	Garson On, Acceleration	1965	1760	0.09	19556	1965	1760	0.09	19556	1965	1760	0.09	19556
15	Garson On cont	1965	1760	0.09	19556	1965	1760	0.09	19556	1965	1760	0.09	19556
16	Exit 3, Verdi Off Ramp	1965	1760	0.09	19556	1965	1760	0.09	19556	1965	1760	0.09	19556
17	Exit 2, West Verdi Off	1965	1760	0.09	19556	1965	1760	0.09	19556	1965	1760	0.09	19556
18	Exit 1, West Verdi Off	1965	1760	0.105	16762	1965	1760	0.105	16762	1965	1760	0.105	16762
19	West Verdi On Ramp	1965	1760	0.105	16762	1965	1760	0.105	16762	1965	1760	0.105	16762

Table 3. AADT Impact Threshold I-80 East Eastbound

Horizon Year		7 year				15 year				25 year			
Segment	Location	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range
1	Beginning Segment	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
2	E.McCarran Off Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
3	E.McCarran On Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
4	Sparks Off Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
5	Sparks On Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
6	Vista Off Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
7	Vista On Ramp	2126	1891	0.095	19905	2126	1891	0.095	19905	2126	1891	0.095	19905
8	Vista On Ramp Cont	2126	1891	0.095	19905	2126	1891	0.095	19905	2126	1891	0.095	19905
9	Lockwood Off Ramp	2011	1802	0.095	18968	2126	1891	0.095	19905	2126	1891	0.095	19905
10	Lockwood On Ramp	2011	1802	0.095	18968	2126	1891	0.095	19905	2126	1891	0.095	19905
11	Mustang Off Ramp	2011	1802	0.095	18968	2126	1891	0.095	19905	2126	1891	0.095	19905
12	Mustang On Ramp	2011	1802	0.095	18968	2126	1891	0.095	19905	2126	1891	0.095	19905
13	Mustang On Ramp Cont.	2011	1802	0.095	18968	2126	1891	0.095	19905	2126	1891	0.095	19905
14	Mustang On Ramp Cont.	2011	1802	0.095	18968	2126	1891	0.095	19905	2126	1891	0.095	19905
15	Patrick Off Ramp	2011	1802	0.095	18968	2126	1891	0.095	19905	2126	1891	0.095	19905
16	Patrick On Ramp	2011	1802	0.095	18968	2126	1891	0.095	19905	2126	1891	0.095	19905
17	USA Parkway Off Ramp	2011	1802	0.093	19376	2126	1891	0.093	20333	2126	1891	0.093	20333
18	USA Parkway On Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
19	USA Parkway On Ramp Cont.	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
20	Derby Off Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
21	Derby On Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
22	Orchard Off Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
23	Orchard On Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
24	Painted Rock Off Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
25	Painted Rock On Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
26	Wadsworth Off Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
27	Wadsworth On Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376

Table 4. AADT Impact Threshold I-80 East Westbound

Horizon Year		7 year				15 year				25 year			
Segment	Location	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range	Lane Capacity	Lane Saturation Flow Rate	K	Lane AADT Range
1	Beginning Segment	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
2	Wadsworth Off Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
3	Wadsworth On Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
4	Painted Rock Off Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
5	Painted Rock On Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
6	Orchard Off Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
7	Orchard On Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
8	Derby Off Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
9	Derby On Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
10	USA Parkway Off Ramp	2011	1802	0.093	19376	2011	1802	0.093	19376	2011	1802	0.093	19376
11	USA Parkway On Ramp	2060	1846	0.093	19849	2178	1937	0.093	20828	2178	1937	0.093	20828
12	Patrick Off Ramp	2060	1846	0.095	19432	2178	1937	0.095	20389	2178	1937	0.095	20389
13	Patrick On Ramp	2060	1846	0.095	19432	2178	1937	0.095	20389	2178	1937	0.095	20389
14	Patrick On Ramp Cont.	2060	1846	0.095	19432	2178	1937	0.095	20389	2178	1937	0.095	20389
15	Patrick On Ramp Cont.	2060	1846	0.095	19432	2178	1937	0.095	20389	2178	1937	0.095	20389
16	Mustang Off Ramp	2060	1846	0.095	19432	2178	1937	0.095	20389	2178	1937	0.095	20389
17	Mustang On Ramp	2060	1846	0.095	19432	2178	1937	0.095	20389	2178	1937	0.095	20389
18	Lockwood Off Ramp	2060	1846	0.095	19432	2178	1937	0.095	20389	2178	1937	0.095	20389
19	Lockwood On Ramp	2060	1846	0.095	19432	2178	1937	0.095	20389	2178	1937	0.095	20389
20	Vista Off Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
21	Vista On Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
22	Vista On Ramp Cont	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
23	Vista On Ramp Cont	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
24	Sparks Off Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
25	Sparks On Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
26	Sparks On Ramp Cont.	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
27	McCarran Off Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
28	McCarran On Loop Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
29	McCarran On Loop Ramp Con	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523
30	McCarran On Ramp	2178	1937	0.086	22523	2178	1937	0.086	22523	2178	1937	0.086	22523

Table 5. I-80 West Corridor Eastbound - Likelihood of Estimated Average AADT by Horizon Year.

Segment	Location	Bin Size			Average AADT			7 year Likelihood			15 year Likelihood			25 year Likelihood		
		7 year	15 year	25 year	7 year	15 year	25 year	Lower	Average	Higher	Lower	Average	Higher	Lower	Average	Higher
1	Stateline to West Verdi	17162	17162	17162	16760	18230	19760	0%	100%	0%	0%	100%	0%	0%	100%	0%
2	WVerdi Between Ramps	17162	17162	17162	15880	17500	19000	0%	100%	0%	4%	96%	0%	0%	100%	0%
3	West Verdi to Verdi	20022	20022	20022	21510	26110	37880	0%	100%	0%	0%	100%	0%	0%	100%	0%
4	Verdi to Garson	20022	20022	20022	23250	28940	43210	0%	100%	0%	0%	100%	0%	0%	100%	0%
5	Garson Between Ramps	20022	20022	20022	21290	25980	40020	0%	100%	0%	0%	100%	0%	0%	50%	50%
6	Garson to East Verdi	20022	20022	20022	25720	34270	49220	0%	100%	0%	0%	100%	0%	0%	100%	0%
7	East Verdi to Mogul	20022	20022	20022	29230	38740	54840	0%	100%	0%	0%	63%	37%	0%	100%	0%
8	Mogul Between Ramps	20022	20022	20022	26440	35370	50620	0%	100%	0%	0%	99%	1%	0%	100%	0%
9	Mogul to West 4th	20022	20022	20022	28660	38390	54220	0%	100%	0%	0%	73%	27%	0%	100%	0%
10	West 4th to Robb	24213	24213	24213	25840	34120	47190	16%	84%	0%	0%	100%	0%	0%	73%	27%
11	Robb Between Ramps	24213	24213	24213	22150	29630	41470	0%	95%	5%	0%	100%	0%	0%	100%	0%
12	Robb to McCarran	24213	24213	24213	36000	45720	59070	0%	100%	0%	0%	86%	14%	0%	100%	0%
13	McCarran Between Ramps	24213	24213	24213	27140	34120	43340	0%	100%	0%	0%	100%	0%	0%	100%	0%
14	McCarran to Urban	24213	24213	24213	40310	49220	60590	0%	100%	0%	39%	61%	0%	0%	100%	0%

Table 6. I-80 West Corridor Eastbound - Likelihood of Estimated Average AADT by Horizon Year.

Segment	Location	Bin Size			Average AADT			7 year Likelihood			15 year Likelihood			25 year Likelihood		
		7 year	15 year	25 year	7 year	15 year	25 year	Lower	Average	Higher	Lower	Average	Higher	Lower	Average	Higher
1	Urban to W.McCarran	24213	24213	24213	40540	49650	61670	0%	100%	0%	40%	60%	0%	0%	100%	0%
2	McCarran between Ramps	24213	24213	24213	26530	33500	43270	1%	99%	0%	0%	100%	0%	0%	100%	0%
3	McCarran to Robb	24213	24213	24213	36020	45980	60560	0%	100%	0%	0%	88%	12%	0%	100%	0%
4	Robb between ramps	20511	20511	20511	21990	29570	42470	16%	84%	0%	0%	100%	0%	22%	78%	0%
5	Robb to West 4th	20511	20511	20511	26280	34900	49470	0%	100%	0%	0%	100%	0%	0%	100%	0%
6	West 4th to Mogul	20511	20511	20511	28780	38720	55680	0%	100%	0%	0%	82%	18%	0%	100%	0%
7	Mogul between ramps	20511	20511	20511	26750	35780	51820	0%	100%	0%	0%	79%	21%	0%	100%	0%
8	Mogul to East Verdi	20511	20511	20511	29500	39070	56060	0%	100%	0%	0%	79%	21%	0%	100%	0%
9	East Verdi to Garson	20511	20511	20511	26130	34780	50720	0%	100%	0%	0%	100%	0%	0%	100%	0%
10	Garson between ramps	20511	20511	20511	21030	25440	40420	0%	100%	0%	0%	100%	0%	0%	100%	0%
11	Garson to Verdi	19556	19556	19556	23710	29530	44920	0%	100%	0%	0%	100%	0%	0%	100%	0%
12	Verdi to West Verdi	19556	19556	19556	22140	26990	40160	4%	96%	0%	0%	100%	0%	8%	92%	0%
13	West Verdi between ramps	16762	16762	16762	14290	15380	15490	0%	100%	0%	0%	100%	0%	0%	100%	0%
14	West Verdi to Stateline	16762	16762	16762	16490	17910	19290	0%	95%	5%	0%	100%	0%	0%	100%	0%

Table 7. I-80 East Corridor Eastbound - Likelihood of Estimated Average AADT by Horizon Year.

Segment	Location	Bin Size			Average AADT			7 year Likelihood			15 year Likelihood			25 year Likelihood		
		7 year	15 year	25 year	7 year	15 year	25 year	Lower	Average	Higher	Lower	Average	Higher	Lower	Average	Higher
1	Urban to E.McCarran	22523	22523	22523	55970	65370	74560	7%	88%	5%	3%	47%	50%	23%	72%	5%
2	East McCarran between Ramps EB	22523	22523	22523	42170	49900	59820	0%	71%	29%	39%	60%	1%	4%	66%	30%
3	McCarran and Sparks	22523	22523	22523	50900	61470	76090	16%	84%	0%	2%	65%	33%	15%	84%	1%
4	Sparks between Ramps	22523	22523	22523	38530	47430	61690	0%	95%	5%	39%	61%	0%	1%	78%	21%
5	Sparks and Vista	22523	22523	22523	41080	50780	66130	0%	86%	14%	23%	77%	0%	0%	48%	52%
6	Vista between ramps	22523	22523	22523	29490	34270	47900	0%	100%	0%	0%	99%	1%	32%	68%	0%
7	Vista and Lockwood	19905	19905	19905	37580	47120	66340	0%	73%	27%	2%	97%	1%	12%	87%	1%
8	Lockwood between ramps	18968	19905	19905	30740	38760	54950	0%	95%	5%	0%	66%	34%	0%	79%	21%
9	Lockwood and Mustang	18968	19905	19905	31670	39840	56590	0%	94%	6%	56%	44%	0%	0%	64%	36%
10	mustang betwwen ramps	18968	19905	19905	26550	32370	46980	0%	100%	0%	0%	97%	3%	8%	92%	0%
11	Mustang and Patrick/new int	18968	19905	19905	26740	32620	47400	0%	100%	0%	0%	96%	4%	7%	93%	0%
12	Patrick between ramps	18968	19905	19905	19750	24380	31150	34%	66%	0%	2%	98%	0%	0%	100%	0%
13	Patrick and USA	19376	19376	19376	21010	26060	34830	12%	88%	0%	0%	100%	0%	0%	89%	11%
14	Usa between ramps	19376	19376	19376	14640	18530	22400	0%	100%	0%	0%	69%	31%	6%	94%	0%
15	USA and Derby	19376	19376	19376	17140	21620	28060	0%	100%	0%	0%	100%	0%	0%	100%	0%
16	Derby betwwen ramps	19376	19376	19376	17050	21500	27900	0%	100%	0%	0%	100%	0%	0%	100%	0%
17	Derby and Orchard	19376	19376	19376	17110	21590	28030	0%	100%	0%	0%	100%	0%	0%	100%	0%
18	Orchard between ramps	19376	19376	19376	17020	21460	27860	0%	100%	0%	0%	100%	0%	0%	100%	0%
19	Orchard and Painted Rock	19376	19376	19376	17080	21550	27980	0%	100%	0%	0%	100%	0%	0%	100%	0%
20	Painted Rock between ramps	19376	19376	19376	16960	21380	27760	0%	100%	0%	0%	100%	0%	0%	100%	0%
21	Panted Rock and Wadsworth	19376	19376	19376	17040	21490	27900	0%	100%	0%	0%	100%	0%	0%	100%	0%
22	wadsworth between ramps	19376	19376	19376	16540	20920	26800	0%	100%	0%	0%	100%	0%	0%	100%	0%
23	East of Wadsworth	19376	19376	19376	16660	21060	27020	0%	100%	0%	0%	100%	0%	0%	100%	0%

Table 8. I-80 East Corridor Westbound - Likelihood of Estimated Average AADT by Horizon Year.

Segment	Location	Bin Size			Average AADT			7 year Likelihood			15 year Likelihood			25 year Likelihood		
		7 year	15 year	25 year	7 year	15 year	25 year	Lower	Average	Higher	Lower	Average	Higher	Lower	Average	Higher
1	East of Wadsworth	19376	19376	19376	16760	21090	27210	0%	100%	0%	0%	100%	0%	0%	100%	0%
2	Wadsworth between ramps	19376	19376	19376	16640	20960	26990	0%	100%	0%	1%	99%	0%	0%	100%	0%
3	Wadsworth and Painted Rock	19376	19376	19376	17140	21530	28100	0%	100%	0%	0%	100%	0%	0%	100%	0%
4	Painted Rock between ramps	19376	19376	19376	17060	21420	27960	0%	100%	0%	0%	100%	0%	0%	100%	0%
5	Painted Rock and Orchard	19376	19376	19376	17180	21590	28190	0%	100%	0%	0%	100%	0%	0%	100%	0%
6	Orchard between ramps	19376	19376	19376	17120	21500	28070	0%	100%	0%	0%	100%	0%	0%	100%	0%
7	Orchard and Derby	19376	19376	19376	17210	21630	28240	0%	100%	0%	0%	100%	0%	0%	100%	0%
8	Derby betwwen ramps	19376	19376	19376	17150	21540	28110	0%	100%	0%	0%	100%	0%	0%	100%	0%
9	Derby and USA	19376	19376	19376	17240	21670	28270	0%	100%	0%	0%	100%	0%	0%	100%	0%
10	Usa between ramps	19432	20389	20389	14730	18570	22580	0%	100%	0%	0%	91%	9%	12%	88%	0%
11	USA and Patrick	19432	20389	20389	21150	26090	35140	24%	76%	0%	0%	100%	0%	0%	96%	4%
12	Patrick between ramps	19432	20389	20389	19880	24410	31520	46%	54%	0%	4%	96%	0%	0%	100%	0%
13	Patrick and Mustang	19432	20389	20389	26880	32660	47870	0%	100%	0%	0%	99%	1%	7%	93%	0%
14	mustang betwwen ramps	19432	20389	20389	26690	32410	47450	0%	100%	0%	0%	99%	1%	8%	92%	0%
15	Mustang and Lockwood	19432	20389	20389	31870	39930	57230	0%	93%	7%	0%	60%	40%	0%	70%	30%
16	Lockwood between ramps	19432	22523	22523	30940	38840	55580	0%	69%	31%	0%	34%	66%	0%	48%	52%
17	Lockwood and Vista	19432	22523	22523	37840	47220	67080	0%	69%	31%	34%	66%	0%	0%	48%	52%
18	Vista between ramps	22523	22523	22523	29750	34370	48610	3%	97%	0%	0%	100%	0%	24%	76%	0%
19	Vista and Sparks	22523	22523	22523	41560	50950	67340	0%	83%	17%	26%	74%	0%	0%	39%	61%
20	Sparks between Ramps	22523	22523	22523	39000	47600	62870	0%	91%	9%	41%	59%	0%	1%	70%	29%
21	Sparks and McCarran	22523	22523	22523	51540	61690	77580	22%	78%	0%	1%	69%	30%	10%	89%	1%
22	East McCarran between Ramps	22523	22523	22523	42840	50130	61440	0%	64%	36%	40%	60%	0%	4%	59%	37%
23	East McCarran between on Ramps	22523	22523	22523	48800	56810	68200	45%	55%	0%	18%	61%	21%	36%	64%	0%
24	West of McCarran	22523	22523	22523	56960	65710	76680	8%	84%	8%	4%	47%	49%	18%	77%	5%

APPENDIX 6-G

PROJECT RISK MANAGEMENT PLAN

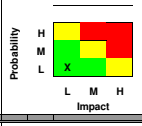
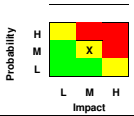
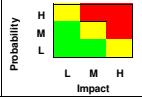
Program Title

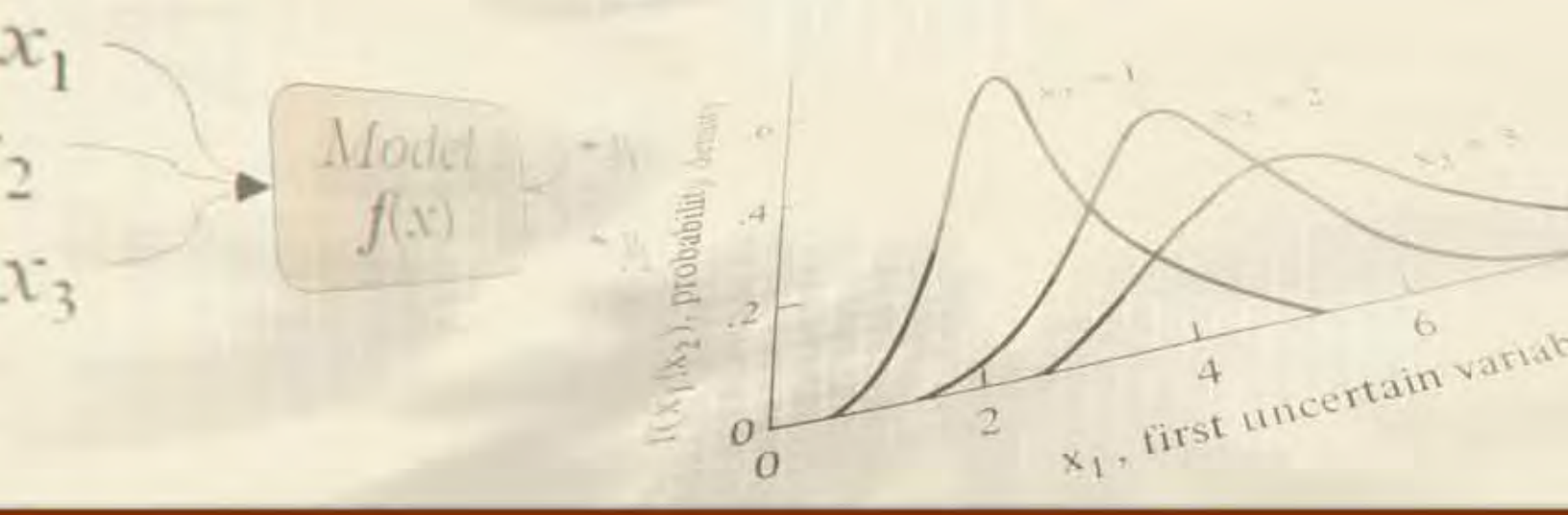
Program Number

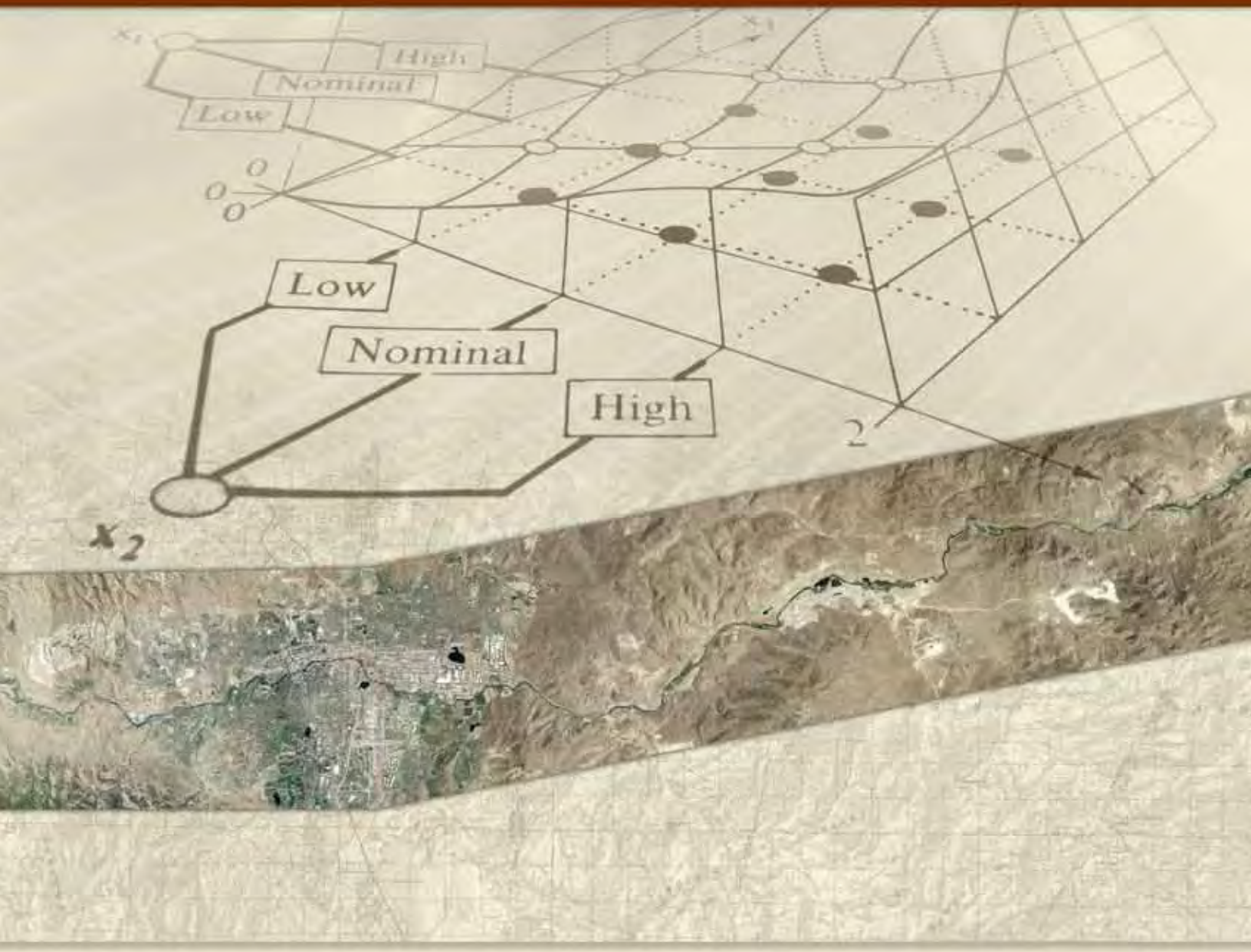
Date

Program Manager Name **Telephone Number** (xxx) xxx-xxxx

PROJECT RISK MANAGEMENT PLAN

Priority	Risk Identification								Qualitative Analysis			Risk Owner	Risk-Response Strategy		Monitoring and Control	
	Status	**ID #**	**Date Identified Project Phase**	**Risk Event** (threat/opportunity)	**SMART Column**	**Risk Trigger**	**Impact Area**	**Affected Level 1 process**	**Probability**	**Impact**	**Risk Matrix**		**Strategy**	**ACTION TO BE TAKEN** (include advantages and disadvantages)	**Status Interval or Milestone Check**	**Date, Status and Review Comments**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Instructions	**Active**=actively monitored & controlled **Dormant**=risk is not currently a high priority, but may become active in the future. **Retired**=no longer a threat to project objectives.	**E1**	For example: April 2009	Risk is an uncertain event or condition that, if it occurs, has a positive (opportunity) or negative (threat) on a project. For example; Development in the area north of Patrick occurs faster than anticipated.	Detailed description of the risk. Includes information on the risk that is **Specific, Measureable, Attributable, Relevant** and **Timebound.** Describe the consequences of the risk to scope, timeline, budget or quality.	Triggers are indications that a risk has occurred or is about to occur. Used to determine when to implement the Risk Response Strategy. For example: Rapid VMT increase.	Is the primary impact to the scope, timeline, or budget?	Which element will be modified as part of the response strategy? For example: Reevaluation of the latent capacity	Assessment of the likelihood of occurrence. Valid entries are Low or High.	The severity of the risk's effect on the projects objectives. Valid entries are Low or High.	**High**: Substantial impact on cost, schedule, or technical. Substantial action required to alleviate issue. **Medium**: Average impact on cost, schedule, or technical. Action required to alleviate the issue. **Low**: Minimal impact on cost, schedule, or technical. Normal management oversight is sufficient.	Name of the person or office responsible for managing the risk event.	**A**voidance **T**ransferance **M**itigation **A**cceptance	Develop options and determine actions to be taken in response to the risk event. Immediate action may be required at the time of identification. Estimate value of risk and estimate cost to respond.	For example: Every 3 years	For example: Last status update 4/30/10.
	Active		4/8/2009 Planning	External Traffic grows more rapidly than predicted	The AADT growth rate at Lockwood exceeds ---% a year	AADT at Lockwood interchange exceeds ____	Timeline		Low	Low		NDOT Information Division	**Acceptance**	Revise the Latent Capacity Analysis to confirm that no immediate intervention is required.		
									Medium	Medium						
																


x_1
x_2
x_3
Model
$f(x)$
x_1, first uncertain variab
0
2
4
6
.2
.4


High
Nominal
Low
Low
Nominal
High
x_2
2