

# Technical Memorandum

October 04, 2022

|                |   |                    |   |
|----------------|---|--------------------|---|
| <b>To</b>      | Mike Woodman (NCTC)<br>Aaron Hoyt (NCTC)<br>Kena Sannar (NCTC)        | <b>Project</b>     | Nevada County Fee Study<br>Updates (RTMF, LTMF, GVTIF)              |
| <b>Copy to</b> | Bjorn Jones (Grass Valley)  |                    | Patrick Perkins (Nevada County)<br>Trisha Tillotson (Nevada County) |
| <b>From</b>    | Billy Park, TE  | <b>Tel</b>         | +1 916 245 4206   |
| <b>Subject</b> | Re-validation and Enhancement to Nevada<br>County Travel Demand Model | <b>Project no.</b> | 11230706; 12560295; 12559906  |

## 1. Introduction

During the first application of the updated model for the nexus studies, some anomalies related to its external trip percentage were found that required modifications to the model. The purpose of this technical memorandum is to document the re-calibration effort that was performed to check for and correct anomalous outputs from the model. This memo can be cited in EIRs and other documents as evidence that the tool used to forecast traffic volumes meets industry standards and is therefore a reasonable basis for planning.

## 2. Model Adjustments

### 2.1 Percentage of External Trips

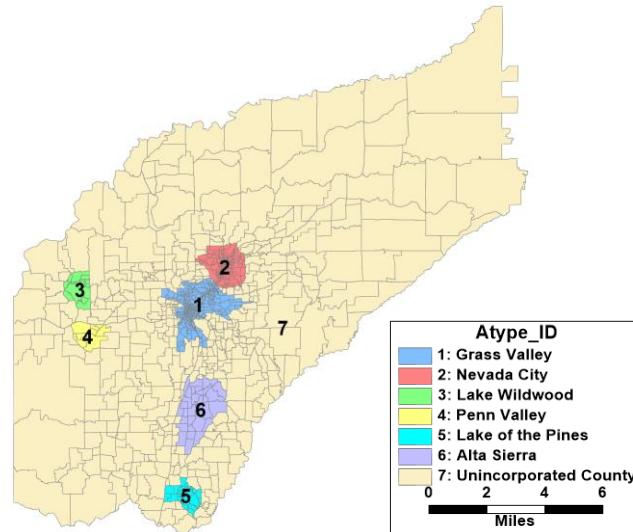
Figure 2.1 displays seven areas, six areas and unincorporated county area, identified in the 2014 version of NCTC model. Census places geographies roughly match with these boundaries, and Table 2.1 summarizes Census Journey-to-work data for each of these six Census places in Nevada County. Due to a lack of a better data, the unincorporated county was assumed to be the same as Grass Valley<sup>1</sup>.

As shown, the external trip percentages of Nevada County residents commuting to outside of the county (Home-based Work Internal-to-External) and the percentage of jobs in Nevada County filled by workers outside of the county (Home-based Work External-to-Internal) vary by Census Places. In the case of Lake of the Pines, nearly 70% of its trips are destined to/oriented from outside of the County, which makes sense given its proximity to the county boundary.

To apply varying percentage of external trips for these areas, GHD revised Home-base Work (HBW) IX and XI percentages to match the Census data shown in Table 2.1. This will improve the accuracy of the model's forecasts used for both the nexus study and the analyses of VMT impacts in future Environmental Impact Reports.

<sup>1</sup> If we had used Census data for county as a whole, it would have distorted the results because it would have included Truckee and the eastern unincorporated areas whose travel characteristics are different from the western part of the county represented in the model.

**Figure 2.1 Area Types Map**



**Table 2.1 External Trip % from U.S. Census Journey-to-work**

|   | Area              | HBW IX % | HBW XI % |
|---|-------------------|----------|----------|
| 1 | Grass Valley      | 41.5%    | 34.2%    |
| 2 | Nevada City       | 43.2%    | 30.3%    |
| 3 | Lake Wildwood     | 55.8%    | 41.7%    |
| 4 | Penn Valley       | 47.6%    | 26.3%    |
| 5 | Lake of the Pines | 69.6%    | 66.5%    |
| 6 | Alta Sierra       | 55.5%    | 36.4%    |
| 7 | Other (rural)     | 41.5%    | 34.2%    |

## 2.2 Traffic Counts & Station Weights

Nevada County provided the traffic counts that were used in the 2018 model validation. It includes 2018 counts as well as counts from previous years that were projected to 2018 conditions. GHD eliminated the traffic counts that are older than 2011 because the traffic pattern in Nevada County changed significantly following the construction of the Dorsey Drive Interchange and other improvements. We also removed low volumes roads such as dirt and gravel roads whose traffic volumes are too low to be forecast accurately with a traffic model<sup>2</sup>.

Traffic counts did not include all gateway locations at the county line. GHD updated or added gateway counts with 2019 volume estimates from “big data” source Replica along the Nevada/Placer County lines.

The station weights were then updated using the revised traffic counts, and Table 2.2 summarizes the station weights that were applied to the revised NCTC model.

<sup>2</sup> Very-low-volume roads may appear in traffic models to help identify locations but have little functional value. In the event that a significant development project were to be proposed that is served by a very-low-volume road, then the analyst would probably need to add TAZs so that the traffic associated with the new development enters and leaves the road system at the correct location(s).

**Table 2.2 External Trip % from U.S. Census Journey-to-work**

| <b>Gateway</b> | <b>Description</b>                       | <b>Station Weights</b> |
|----------------|--|------------------------|
| 2001           | SR 20 West - Nevada/Yuba County Line     | 14.6%                  |
| 2002           | SR 49 North - Nevada/Yuba County Line    | 3.2%                   |
| 2003           | SR 20 East - Nevada/Placer County Line   | 5.0%                   |
| 2004           | SR 174 - Nevada/Placer County Line       | 12.2%                  |
| 2005           | Dog Bar Road - Nevada/Placer County Line | 2.4%                   |
| 2006           | SR 49 South - Nevada/Placer County Line  | 62.7%                  |

## **2.3 Through Trips**

Once the Internal-to-External and External-to-Internal trip volumes were corrected using Census Journey-to-work data, the residual unaccounted-for volumes at traffic counts at gateways were identified as through trips. The through trip matrix was updated accordingly.

## **2.4 Model Network**

The model network was updated along SR 49 to improve loadings based on aerial photos, especially for recent construction of frontage roads near La Barr Meadows Road.

# **3. Validation**

The NCTC model has been re-validated after adjusting some inputs described in earlier sections.

The California Transportation Commission (CTC) published guidelines for model calibration as part of its 2017 Regional Transportation Plan Guidelines for Metropolitan Planning Organizations. The guidelines give three thresholds for validity, namely:

- At least 75 percent of the roadway links should be within the Caltrans maximum desirable deviation, which ranges from approximately 15 to 60 percent depending on total volume (the larger the volume, the less deviation is permitted).
- The correlation coefficient between the traffic counts and the estimated traffic volumes should be greater than 88 percent.
- The percent Root Mean Square Error (RSME) should be less than 40%.

In addition to the CTC acceptance criteria, another widely-used criterion was applied, namely:

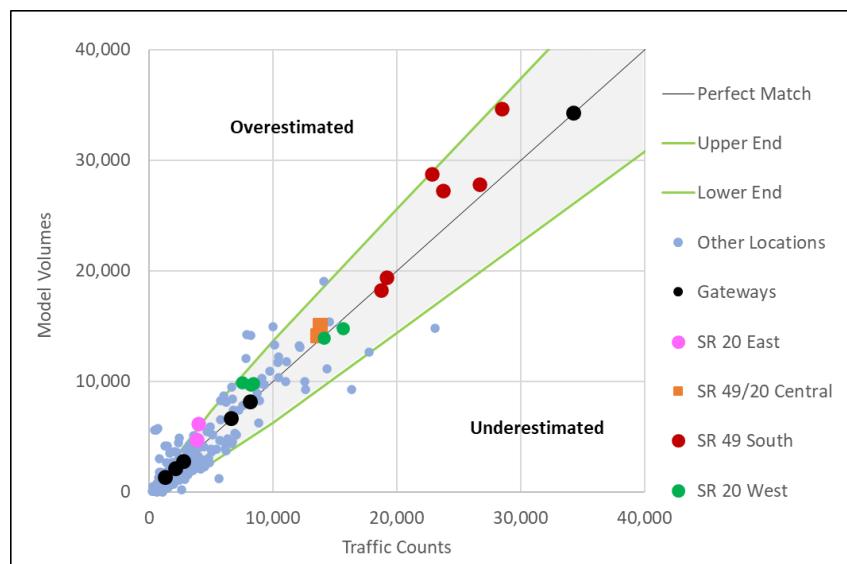
- The two-way sum of the volumes on all roadway links for which counts are available should be within 10 percent of the counts.

Table 3.1 summarizes the results of the link-level validation tests against over 200 daily locations and 50 locations for AM peak hour and PM peak hour. The model meets the CTC validation criteria for all three forecast periods (daily, AM peak hour, and PM peak hour). Figure 3.1, Figure 3.2, and Figure 3.3 are scatter diagrams comparing the model's volumes to the traffic counts for individual locations for the daily, AM peak hour, and PM peak hour, respectively. The allowable deviation is shaded in the figure. These figures show a good match of forecasts to counts with no systematic bias towards over- or under-predicting traffic. The model was within the maximum acceptable deviation in all cases, which indicates that the model provides reasonable estimates of total traffic flows between different parts of Nevada County.

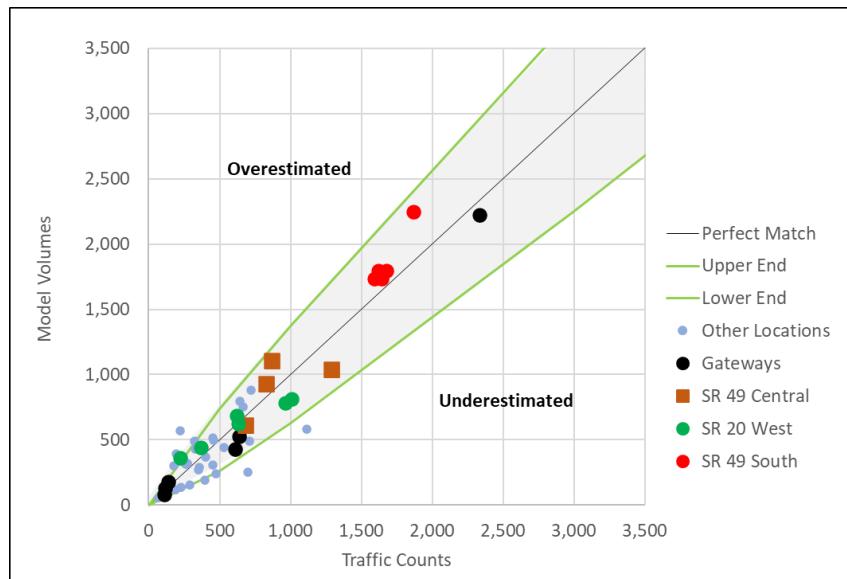
**Table 3.1 Link-Level Validation Results**

| Validation Criterion                                  | Threshold for Acceptance | Daily | AM Peak Hour | PM Peak Hour |
|---|--------------------------|-------|--------------|--------------|
| Count Sites Percent Within Caltrans Maximum Deviation | At Least 75%             | 81% ✓ | 88% ✓        | 94% ✓        |
| Model/Count Ratio                                     | Within 10%               | 2% ✓  | -1% ✓        | -1% ✓        |
| Percent Root Mean Square Error                        | Less than 40%            | 38% ✓ | 28% ✓        | 23% ✓        |
| Coefficient of Determination                          | At Least 77%             | 90% ✓ | 90% ✓        | 92% ✓        |
| Correlation Coefficient                               | At Least 88%             | 95% ✓ | 95% ✓        | 96% ✓        |

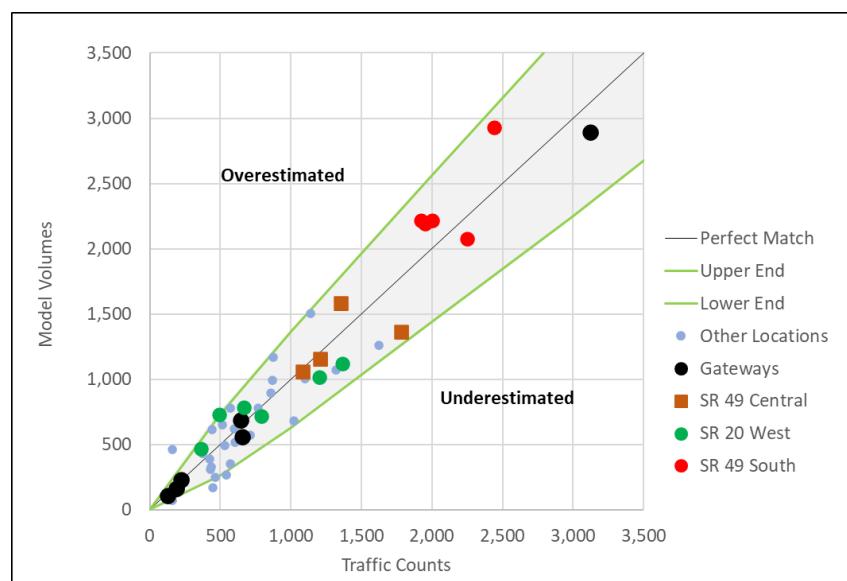
**Figure 3.1 Modeled Volumes versus Traffic Counts (Daily)**



**Figure 3.2 Modeled Volumes versus Traffic Counts (AM Peak Hour)**



**Figure 3.3 Modeled Volumes versus Traffic Counts (PM Peak Hour)**



## **Appendix**

### **Validation Results**





### Check of Daily Volumes (continuous)

| Roadway  | Segment  | Model Volume                          | Traffic Count | Model / Count   | Maximum Deviation | Within Deviation                           | Model - Count | Difference Squared                                   |  |
|--|--|---------------------------------------|---------------|---|-------------------|--|---------------|--|--|
| GRACIE ROAD  | GRACIE RD SE OF GOLD FLAT RD                               | 1,830                                 | 1,502         | 1.22  | 0.60              | Yes  | 328           | 107,773  |  |
| GRACIE ROAD  | GRACIE RD NW OF BANNER LAVA CAP RD                         | 1,292                                 | 777           | 1.66  | 0.60              | No   | 515           | 265,090  |  |
| GREENHORN ROAD   | GREENHORN RD E. OF TOBY TR                                 | 1,060                                 | 1,126         | 0.94  | 0.60              | Yes  | -66           | 4,415  |  |
| GREENHORN ROAD   | GREENHORN RD NE OF BRUNSWICK RD                            | 2,606                                 | 3,539         | 0.74  | 0.60              | Yes  | -933          | 870,541  |  |
| GREENHORN ROAD   | GREENHORN RD E. OF ANCHOR LN                               | 1,937                                 | 2,283         | 0.85  | 0.60              | Yes  | -346          | 119,379  |  |
| IDAHO MARYLAND ROAD  | IDAHO MARYLAND RD E. OF BRUNSWICK RD                       | 2,116                                 | 2,424         | 0.87  | 0.60              | Yes  | -308          | 95,089   |  |
| IDAHO MARYLAND ROAD  | IDAHO MARYLAND RD W. OF BANNER LAVA CAP RD                 | 1,142                                 | 1,509         | 0.76  | 0.60              | Yes  | -367          | 134,532  |  |
| IDAHO MARYLAND ROAD  | IDAHO MARYLAND W. OF SILK TASSEL                           | 2,116                                 | 2,027         | 1.04  | 0.60              | Yes  | 89            | 7,886  |  |
| LAKE VERA-PURDON ROAD                                      | LAKE VERA-PURDON RD NW OF N BLOOMFIELD-GRANITEVILLE        | 1,606                                 | 3,154         | 0.51  | 0.60              | Yes  | -1,548        | 2,396,302  |  |
| LAKE VERA-PURDON ROAD                                      | LAKE VERA-PURDON RD N. OF NEW ROME RD                      | 419                                   | 440           | 0.95  | 0.60              | Yes  | -21           | 448  |  |
| LAKE VERA-PURDON ROAD                                      | LAKE VERA-PURDON RD S. OF NEW ROME RD                      | 744                                   | 796           | 0.94  | 0.60              | Yes  | -52           | 2,658  |  |
| LAKE VERA-PURDON ROAD                                      | LAKE VERA-PURDON RD N. OF ROCK CREEK RD                    | 1,118                                 | 1,251         | 0.89  | 0.60              | Yes  | -133          | 17,700   |  |
| LAWRENCE WAY   | LAWRENCE WY W. OF NORLENE WY                               | 586                                   | 1,093         | 0.54  | 0.60              | Yes  | -507          | 257,496  |  |
| LIME KILN ROAD   | LIME KILN RD W. OF HWY 49                                  | 3,795                                 | 2,962         | 1.28  | 0.60              | Yes  | 833           | 693,905  |  |
| MOONEY FLAT ROAD   | MOONEY FLAT RD W. OF PLEASANT VALLEY RD                    | 55                                    | 245           | 0.22  | 0.60              | No   | -190          | 35,933   |  |
| MOONEY FLAT ROAD   | MOONEY FLAT RD N. OF HWY 20                                | 338                                   | 704           | 0.48  | 0.60              | Yes  | -366          | 134,227  |  |
| NEWTOWN ROAD   | NEWTOWN RD NE OF BITNEY SPRINGS RD                         | 1,676                                 | 1,368         | 1.22  | 0.60              | Yes  | 308           | 94,669   |  |
| NEWTOWN ROAD   | NEWTOWN RD SW OF HWY 49                                    | 1,538                                 | 1,760         | 0.87  | 0.60              | Yes  | -222          | 49,470   |  |
| NORLENE WAY  | NORLENE WY S. OF LAWRENCE WY                               | 1,815                                 | 816           | 2.23  | 0.60              | No   | 999           | 998,935  |  |
| NORLENE WAY  | NORLENE WY S. OF TIPPY WY                                  | 737                                   | 1,426         | 0.52  | 0.60              | Yes  | -689          | 474,609  |  |
| NORTH BLOOMFIELD-GRANITEVILLE RD N. OF HWY 49              | NORTH BLOOMFIELD-GRANITEVILLE RD N. OF HWY 49              | 1,910                                 | 2,869         | 0.67  | 0.60              | Yes  | -959          | 919,134  |  |
| NORTH BLOOMFIELD-GRANITEVILLE RD N. OF COOPER RD           | NORTH BLOOMFIELD-GRANITEVILLE RD N. OF COOPER RD           | 1,241                                 | 1,123         | 1.10  | 0.60              | Yes  | 118           | 13,833   |  |
| NORTH BLOOMFIELD-GRANITEVILLE RD E. OF LAKE VERA-PURDON RD | NORTH BLOOMFIELD-GRANITEVILLE RD E. OF LAKE VERA-PURDON RD | 180                                   | 614           | 0.29  | 0.60              | No   | -434          | 188,162  |  |
| OAK TREE ROAD  | OAK TREE RD NW OF TYLER FOOTE CROSSING RD                  | 386                                   | 1,464         | 0.26  | 0.60              | No   | -1,078        | 1,162,775  |  |
| OAK TREE ROAD  | OAK TREE RD E. OF CHEROKEE RD                              | 976                                   | 1,561         | 0.63  | 0.60              | Yes  | -585          | 342,618  |  |
| PATRICIA WAY   | PATRICIA WY S. OF ALEXANDRA WY                             | 18                                    | 1,086         | 0.02  | 0.60              | No   | -1,068        | 1,141,406  |  |
| PURDON ROAD  | PURDON RD SE OF TYLER FOOTE CROSSING RD                    | 307                                   | 732           | 0.42  | 0.60              | Yes  | -425          | 180,332  |  |
| QUAKER HILL CROSS ROAD                                     | QUAKER HILL CROSS RD NE OF RED DOG RD                      | 866                                   | 1,692         | 0.51  | 0.60              | Yes  | -826          | 681,780  |  |
| RATTLESNAKE ROAD   | RATTLESNAKE RD NE OF DOG BAR RD                            | 356                                   | 674           | 0.53  | 0.60              | Yes  | -318          | 101,124  |  |
| RED DOG CROSS ROAD   | RED DOG RD E. OF BANNER LAVA CAP RD                        | 263                                   | 402           | 0.65  | 0.60              | Yes  | -139          | 19,426   |  |
| RED DOG ROAD   | RED DOG RD SE OF PASQUALE RD                               | 2,906                                 | 2,385         | 1.22  | 0.60              | Yes  | 521           | 271,441  |  |
| RED DOG ROAD   | RED DOG RD NW OF PARK AV                                   | 3,843                                 | 3,508         | 1.10  | 0.60              | Yes  | 335           | 112,225  |  |
| ROUGH AND READY ROAD                                       | ROUGH AND READY RD W. OF ROUGH AND READY HWY               | 1,099                                 | 1,218         | 0.90  | 0.60              | Yes  | -119          | 14,161   |  |
| ROUGH AND READY ROAD                                       | ROUGH AND READY RD W. OF PROSPECTOR RD                     | 665                                   | 796           | 0.84  | 0.60              | Yes  | -131          | 17,161   |  |
| SCOTTS FLAT ROAD   | SCOTTS FLAT RD S. OF HWY 20                                | 758                                   | 724           | 1.05  | 0.60              | Yes  | 34            | 1,185  |  |
| SPENCEVILLE ROAD   | SPENCEVILLE RD SW OF INDIAN SPRINGS RD                     | 193                                   | 447           | 0.43  | 0.60              | Yes  | -254          | 64,350   |  |
| SQUIRREL CREEK ROAD  | SQUIRREL CREEK RD W. OF ROUGH AND READY HWY                | 3,223                                 | 3,272         | 0.99  | 0.60              | Yes  | -49           | 2,401  |  |
| SQUIRREL CREEK ROAD  | SQUIRREL CREEK RD W. OF ADAMS AV                           | 890                                   | 1,609         | 0.55  | 0.60              | Yes  | -719          | 516,961  |  |
| SQUIRREL CREEK ROAD  | SQUIRREL CREEK RD E. OF ADAMS AV                           | 1,123                                 | 2,218         | 0.51  | 0.60              | Yes  | -1,095        | 1,199,025  |  |
| SQUIRREL CREEK ROAD  | SQUIRREL CREEK SW OF PROCTOR CT.                           | 352                                   | 631           | 0.56  | 0.60              | Yes  | -279          | 77,918   |  |
| TAMMY WAY  | TAMMY WY E. OF NORLENE WY                                  | 314                                   | 712           | 0.44  | 0.60              | Yes  | -398          | 158,258  |  |
| TIPPY WAY  | TIPPY WY S. OF ALTA SIERRA DR                              | 726                                   | 1,410         | 0.51  | 0.60              | Yes  | -684          | 467,514  |  |
| TYLER FOOTE CROSSING                                       | TYLER FOOTE CROSSING RD S. OF CRUZON GRADE RD              | 437                                   | 477           | 0.92  | 0.60              | Yes  | -40           | 1,594  |  |
| WHEELER CROSS ROAD   | WHEELER CROSS RD E. OF DOG BAR RD                          | 1,166                                 | 1,275         | 0.91  | 0.60              | Yes  | -109          | 11,779   |  |
| WILLOW VALLEY ROAD   | WILLOW VALLEY RD NEVADA CITY CORP LIMIT                    | 478                                   | 1,589         | 0.30  | 0.60              | No   | -1,111        | 1,234,494  |  |
| WOLF ROAD  | WOLF RD S. OF LIME KILN RD                                 | 802                                   | 615           | 1.30  | 0.60              | Yes  | 187           | 34,805   |  |
| WOLF ROAD  | WOLF RD W. OF DUGGANS RD                                   | 673                                   | 1,544         | 0.44  | 0.60              | Yes  | -871          | 758,913  |  |
| YOU BET ROAD   | YOU BET RD NE OF HWY 174                                   | 1,765                                 | 2,245         | 0.79  | 0.60              | Yes  | -480          | 230,874  |  |
| YOU BET ROAD   | YOU BET RD E. OF GREENHORN CREEK/HANSENS                   | 473                                   | 333           | 1.42  | 0.60              | Yes  | 140           | 19,620   |  |
| Subtotal 1,061,172 1,041,442                               |  | Model/Count Ratio = 1.02              |               | Percent Within Caltrans Maximum Deviation = 81% > 75% |                   | Percent Root Mean Square Error = 38% < 40% |               | Coefficient of Determination ( $R^2$ ) = 0.90 > 0.77 |  |
|  |  | Correlation Coefficient = 0.95 > 0.88 |               |   |                   |  |               |  |  |

### Check of AM Peak Hour Volumes

| Roadway             | Segment   | Model Volume | Traffic Count | Model / Count | Maximum Deviation | Within Deviation | Model - Count | Difference Squared |
|---------------------|---|--------------|---------------|---------------|-------------------|------------------|---------------|--------------------|
| STATE HIGHWAY 20    | SR 20 WEST OF MOONEY FLAT RD (GATEWAY)                  | 530          | 637           | 0.83          | 0.44              | Yes              | -107          | 11,449             |
| STATE HIGHWAY 49    | SR 49 NORTH OF HERON RD (GATEWAY)                       | 132          | 116           | 1.14          | 0.60              | Yes              | 16            | 256                |
| STATE HIGHWAY 20    | SR 20 EAST at PLACER/NEVADA COUNTY LINE (GATEWAY)       | 180          | 137           | 1.31          | 0.60              | Yes              | 43            | 1,849              |
| STATE HIGHWAY 174   | SR 174 SE of REDBERRY RD (GATEWAY)                      | 432          | 611           | 0.71          | 0.44              | Yes              | -179          | 32,041             |
| DOG BAR ROAD        | DOG BAR RD SOUTH OF SPRINGFIELD DR (GATEWAY)            | 84           | 108           | 0.78          | 0.60              | Yes              | -24           | 576                |
| STATE HIGHWAY 49    | SR 49 OVERHILL DR TO LINNET LN (GATEWAY)                | 2,223        | 2,331         | 0.95          | 0.27              | Yes              | -108          | 11,664             |
| STATE HIGHWAY 20    | SR 20 EAST of HARMONY RIDGE RD (GATEWAY)                | 288          | 189           | 1.52          | 0.60              | Yes              | 99            | 9,801              |
| STATE HIGHWAY 49    | SR 49 W. MCKNIGHT WAY TO W. EMPIRE STREET (NORTHBOUND)  | 1,041        | 1,291         | 0.81          | 0.33              | Yes              | -250          | 62,435             |
| STATE HIGHWAY 49    | SR 49 W. MCKNIGHT WAY TO W. EMPIRE STREET (SOUTHBOUND)  | 1,105        | 867           | 1.27          | 0.39              | Yes              | 238           | 56,621             |
| STATE HIGHWAY 49/20 | SR 20/49 GOLD FLAT RD TO SACRAMENTO ST (NORTHBOUND)     | 614          | 683           | 0.90          | 0.43              | Yes              | -69           | 4,792              |
| STATE HIGHWAY 49/20 | SR 20/49 GOLD FLAT RD TO SACRAMENTO ST (SOUTHBOUND)     | 932          | 830           | 1.12          | 0.40              | Yes              | 102           | 10,346             |
| STATE HIGHWAY 20    | SR-20, MILL STREET TO SR-49 (WESTBOUND)                 | 443          | 369           | 1.20          | 0.60              | Yes              | 74            | 5,524              |
| STATE HIGHWAY 20    | SR-20, MILL STREET TO SR-49 (EASTBOUND)                 | 687          | 623           | 1.10          | 0.44              | Yes              | 64            | 4,100              |
| STATE HIGHWAY 20    | SR 20 BRIGHTON STREET TO PENN VALLEY DRIVE              | 813          | 1,010         | 0.80          | 0.37              | Yes              | -197          | 38,819             |
| STATE HIGHWAY 20    | SR 20 SR 49 TO NEVADA STREET/MANZANITA DIGGINS DR       | 361          | 225           | 1.61          | 0.60              | No               | 136           | 18,584             |
| STATE HIGHWAY 20    | SR-20 PLEASANT VALLEY RD. TO PENN VALLEY DR.            | 625          | 631           | 0.99          | 0.44              | Yes              | -6            | 38                 |
| STATE HIGHWAY 20    | SR-20 Pleasant Valley Road to Rough & Ready Hwy         | 784          | 963           | 0.81          | 0.38              | Yes              | -179          | 32,058             |
| STATE HIGHWAY 49    | SR 49 PINGREE ROAD TO LITTLE VALLEY ROAD                | 1,733        | 1,592         | 1.09          | 0.31              | Yes              | 141           | 19,841             |
| STATE HIGHWAY 49    | SR 49 WOODRIDGE DR TO COMBIE RD                         | 2,247        | 1,865         | 1.20          | 0.29              | Yes              | 382           | 146,063            |
| STATE HIGHWAY 49    | SR 49 COMBIE RD TO CAMEO DR                             | 1,796        | 1,622         | 1.11          | 0.30              | Yes              | 174           | 30,360             |
| STATE HIGHWAY 49    | SR 49 MEADOWBROOK COURT TO ALTA SIERRA DRIVE            | 1,734        | 1,645         | 1.05          | 0.30              | Yes              | 89            | 7,877              |
| STATE HIGHWAY 49    | SR 49 CRESTVIEW DRIVE TO W. MCKNIGHT WAY                | 1,797        | 1,679         | 1.07          | 0.30              | Yes              | 118           | 13,936             |
| BENNETT STREET      | BENNETT STREET TINLOY STREET TO HANSEN WAY              | 367          | 400           | 0.92          | 0.60              | Yes              | -33           | 1,111              |
| BENNETT STREET      | BENNETT STREET TINLOY STREET TO E. MAIN STREET          | 441          | 532           | 0.83          | 0.46              | Yes              | -91           | 8,295              |
| BRUNSWICK ROAD      | BRUNSWICK RD. NEVADA CITY HWY TO MALTMAN DR.            | 584          | 1,113         | 0.52          | 0.35              | No               | -529          | 280,023            |
| COLFAX AVENUE       | SR 174 CENTRAL AVE TO OPHIR ST                          | 317          | 262           | 1.21          | 0.60              | Yes              | 55            | 2,974              |
| EAST MAIN STREET    | NEV CTY HWY SW. OF BRUNSWICK RD                         | 253          | 696           | 0.36          | 0.43              | No               | -443          | 196,691            |
| EAST MCKNIGHT WAY   | West McKnight Way NB SR 49 Ramps to La Barr Meadows     | 881          | 721           | 1.22          | 0.42              | Yes              | 160           | 25,597             |
| MILL STREET         | Mill Street SR 20 Ramps to French Avenue                | 394          | 194           | 2.03          | 0.60              | No               | 200           | 39,984             |
| MILL STREET         | Mill Street McCourtney Road to SR 20 Ramps              | 515          | 454           | 1.13          | 0.60              | Yes              | 61            | 3,665              |
| NEVADA CITY HIGHWAY | NEV. CTY HWY NE. OF BRUNSWICK RD                        | 493          | 708           | 0.70          | 0.42              | Yes              | -215          | 46,110             |
| SOUTH AUBURN STREET | South Auburn Street, between Badger and Adams           | 320          | 275           | 1.16          | 0.60              | Yes              | 45            | 2,050              |
| STATE HIGHWAY 174   | SR 174 PARTRIDGE RD TO EMPIRE MINE CROSS RD             | 274          | 352           | 0.78          | 0.60              | Yes              | -78           | 6,136              |
| STATE HIGHWAY 174   | SR 174 GOLD HILL DR TO RACE ST                          | 308          | 451           | 0.68          | 0.60              | Yes              | -143          | 20,562             |
| STATE HIGHWAY 174   | SR 174 BRUNSWICK RD TO LOS CENDROS LN                   | 797          | 643           | 1.24          | 0.44              | Yes              | 154           | 23,595             |
| STATE HIGHWAY 174   | SR 174 E. EMPIRE STREET OT CHURCH ENTRANCE              | 488          | 321           | 1.52          | 0.60              | Yes              | 167           | 27,998             |
| STATE HIGHWAY 49    | SR 49 W. BROAD ST/CEMENT HILL RD TO ELKS LODGE ENTRANCE | 428          | 329           | 1.30          | 0.60              | Yes              | 99            | 9,832              |
| STATE HIGHWAY 49    | SR 49 SR 20 TO COYOTE STREET                            | 753          | 665           | 1.13          | 0.43              | Yes              | 88            | 7,772              |
| STATE HIGHWAY 49    | SR 49 NEWTON RD TO JOHN BARLEYCORN RD                   | 330          | 248           | 1.33          | 0.60              | Yes              | 82            | 6,697              |
| WEST EMPIRE STREET  | W EMPIRE ST LE DUC ST TO S AUBURN ST                    | 138          | 227           | 0.61          | 0.60              | Yes              | -89           | 7,871              |
| WEST MCKNIGHT WAY   | West McKnight Way Freeman to Taylorville                | 570          | 222           | 2.57          | 0.60              | No               | 348           | 121,373            |
| GOLD FLAT ROAD      | GOLD FLAT RD HAWKE LN TO HOLLOW WY                      | 157          | 290           | 0.54          | 0.60              | Yes              | -133          | 17,699             |
| MCCOURTNEY ROAD     | McCourtney Road SR 20 Ramps to Mill Street              | 495          | 457           | 1.08          | 0.60              | Yes              | 38            | 1,482              |
| BENNETT STREET      | BENNETT ST HENDERSON ST TO OPHIR ST                     | 191          | 395           | 0.48          | 0.60              | Yes              | -204          | 41,709             |
| COYOTE STREET       | COYOTE ST CHURCH ST TO WASHINGTON ST                    | 299          | 179           | 1.67          | 0.60              | No               | 120           | 14,467             |
| EAST BROAD STREET   | E. BROAD ST MAIN ST TO SR 49                            | 58           | 68            | 0.85          | 0.60              | Yes              | -10           | 109                |
| OPHIR STREET        | OPHIR STREET HWY 174 TO BENNETT STREET                  | 239          | 476           | 0.50          | 0.60              | Yes              | -237          | 56,125             |
| SEARLS AVENUE       | SEARLS AVE RIDGE RD TO PERSEVERANCE MINE CT (SOUTH)     | 119          | 186           | 0.64          | 0.60              | Yes              | -67           | 4,471              |
| WEST BROAD STREET   | W. BROAD ST SPRING STREET TO CHIEF KELLY DR             | 110          | 104           | 1.06          | 0.60              | Yes              | 6             | 34                 |
| ZION STREET         | ZION ST DOANE RD TO ARGALL WY                           | 291          | 359           | 0.81          | 0.60              | Yes              | -68           | 4,690              |

31,191    31,353    Model/Count Ratio = 0.99  
 Percent Within Caltrans Maximum Deviation = 88% > 75%  
 Percent Root Mean Square Error = 28% < 40%  
 Coefficient of Determination ( $R^2$ ) = 0.90 > 0.77  
 Correlation Coefficient = 0.95 > 0.88

### Check of PM Peak Hour Volumes

| Roadway             | Segment   | Model Volume | Traffic Count | Model / Count                              | Maximum Deviation | Within Deviation                                      | Model - Count | Difference Squared |
|---------------------|---|--------------|---------------|--|-------------------|---|---------------|--------------------|
| STATE HIGHWAY 20    | SR 20 WEST OF MOONEY FLAT RD (GATEWAY)                  | 686          | 641           | 1.07                                       | 0.44              | Yes   | 45            | 2,025              |
| STATE HIGHWAY 49    | SR 49 NORTH OF HERON RD (GATEWAY)                       | 166          | 187           | 0.89                                       | 0.60              | Yes   | -21           | 441                |
| STATE HIGHWAY 20    | SR 20 EAST at PLACER/NEVADA COUNTY LINE (GATEWAY)       | 233          | 221           | 1.05                                       | 0.60              | Yes   | 12            | 144                |
| STATE HIGHWAY 174   | SR 174 SE of REDBERRY RD (GATEWAY)                      | 563          | 655           | 0.86                                       | 0.43              | Yes   | -92           | 8,464              |
| DOG BAR ROAD        | DOG BAR RD SOUTH OF SPRINGFIELD DR (GATEWAY)            | 109          | 127           | 0.86                                       | 0.60              | Yes   | -18           | 324                |
| STATE HIGHWAY 49    | SR 49 OVERHILL DR TO LINNET LN (GATEWAY)                | 2,892        | 3,120         | 0.93                                       | 0.25              | Yes   | -228          | 51,984             |
| STATE HIGHWAY 20    | SR 20 EAST of HARMONY RIDGE RD (GATEWAY)                | 362          | 303           | 1.19                                       | 0.60              | Yes   | 59            | 3,444              |
| STATE HIGHWAY 49    | SR 49 W. MCKNIGHT WAY TO W. EMPIRE STREET (NORTHBOUND)  | 1,585        | 1,352         | 1.17                                       | 0.32              | Yes   | 233           | 54,221             |
| STATE HIGHWAY 49    | SR 49 W. MCKNIGHT WAY TO W. EMPIRE STREET (SOUTHBOUND)  | 1,363        | 1,783         | 0.76                                       | 0.30              | Yes   | -420          | 176,498            |
| STATE HIGHWAY 49/20 | SR 20/49 GOLD FLAT RD TO SACRAMENTO ST (NORTHBOUND)     | 1,158        | 1,208         | 0.96                                       | 0.33              | Yes   | -50           | 2,515              |
| STATE HIGHWAY 49/20 | SR 20/49 GOLD FLAT RD TO SACRAMENTO ST (SOUTHBOUND)     | 1,060        | 1,083         | 0.98                                       | 0.36              | Yes   | -23           | 508                |
| STATE HIGHWAY 20    | SR-20, MILL STREET TO SR-49 (WESTBOUND)                 | 718          | 788           | 0.91                                       | 0.41              | Yes   | -70           | 4,958              |
| STATE HIGHWAY 20    | SR-20, MILL STREET TO SR-49 (EASTBOUND)                 | 729          | 493           | 1.48                                       | 0.60              | Yes   | 236           | 55,570             |
| STATE HIGHWAY 20    | SR 20 BRIGHTON STREET TO PENN VALLEY DRIVE              | 1,118        | 1,364         | 0.82                                       | 0.32              | Yes   | -246          | 60,714             |
| STATE HIGHWAY 20    | SR 20 SR 49 TO NEVADA STREET/MANZANITA DIGGINS DR       | 469          | 363           | 1.29                                       | 0.60              | Yes   | 106           | 11,332             |
| STATE HIGHWAY 20    | SR-20 PLEASANT VALLEY RD. TO PENN VALLEY DR.            | 787          | 665           | 1.18                                       | 0.43              | Yes   | 122           | 14,923             |
| STATE HIGHWAY 20    | SR-20 Pleasant Valley Road to Rough & Ready Hwy         | 1,016        | 1,204         | 0.84                                       | 0.33              | Yes   | -188          | 35,368             |
| STATE HIGHWAY 49    | SR 49 PINGREE ROAD TO LITTLE VALLEY ROAD                | 2,191        | 1,950         | 1.12                                       | 0.28              | Yes   | 241           | 58,283             |
| STATE HIGHWAY 49    | SR 49 WOODRIDGE DR TO COMBIE RD                         | 2,929        | 2,440         | 1.20                                       | 0.26              | Yes   | 489           | 239,330            |
| STATE HIGHWAY 49    | SR 49 COMBIE RD TO CAMEO DR                             | 2,215        | 1,924         | 1.15                                       | 0.28              | Yes   | 291           | 84,651             |
| STATE HIGHWAY 49    | SR 49 MEADOWBROOK COURT TO ALTA SIERRA DRIVE            | 2,216        | 2,001         | 1.11                                       | 0.28              | Yes   | 215           | 46,378             |
| STATE HIGHWAY 49    | SR 49 CRESTVIEW DRIVE TO W. MCKNIGHT WAY                | 2,076        | 2,248         | 0.92                                       | 0.27              | Yes   | -172          | 29,512             |
| BENNETT STREET      | BENNETT STREET TINLOY STREET TO HANSEN WAY              | 620          | 599           | 1.03                                       | 0.45              | Yes   | 21            | 421                |
| BENNETT STREET      | BENNETT STREET TINLOY STREET TO E. MAIN STREET          | 779          | 572           | 1.36                                       | 0.45              | Yes   | 207           | 42,888             |
| BRUNSWICK ROAD      | BRUNSWICK RD. NEVADA CITY HWY TO MALTMAN DR.            | 1,263        | 1,624         | 0.78                                       | 0.30              | Yes   | -361          | 130,177            |
| COLFAX AVENUE       | SR 174 CENTRAL AVE TO OPHIR ST                          | 430          | 375           | 1.15                                       | 0.60              | Yes   | 55            | 3,047              |
| EAST MAIN STREET    | NEV CTY HWY SW. OF BRUNSWICK RD                         | 679          | 1,019         | 0.67                                       | 0.37              | Yes   | -340          | 115,747            |
| EAST MCKNIGHT WAY   | West McKnight Way NB SR 49 Ramps to La Barr Meadows     | 1,503        | 1,138         | 1.32                                       | 0.35              | Yes   | 365           | 133,457            |
| MILL STREET         | Mill Street SR 20 Ramps to French Avenue                | 652          | 513           | 1.27                                       | 0.47              | Yes   | 139           | 19,412             |
| MILL STREET         | Mill Street McCourtney Road to SR 20 Ramps              | 897          | 859           | 1.04                                       | 0.39              | Yes   | 38            | 1,453              |
| NEVADA CITY HIGHWAY | NEV. CTY HWY NE. OF BRUNSWICK RD                        | 1,071        | 1,319         | 0.81                                       | 0.32              | Yes   | -248          | 61,735             |
| SOUTH AUBURN STREET | South Auburn Street, between Badger and Adams           | 613          | 442           | 1.39                                       | 0.60              | Yes   | 171           | 29,171             |
| STATE HIGHWAY 174   | SR 174 PARTRIDGE RD TO EMPIRE MINE CROSS RD             | 308          | 428           | 0.72                                       | 0.60              | Yes   | -120          | 14,378             |
| STATE HIGHWAY 174   | SR 174 GOLD HILL DR TO RACE ST                          | 353          | 571           | 0.62                                       | 0.45              | Yes   | -218          | 47,473             |
| STATE HIGHWAY 174   | SR 174 BRUNSWICK RD TO LOS CENDROS LN                   | 990          | 868           | 1.14                                       | 0.39              | Yes   | 122           | 14,867             |
| STATE HIGHWAY 174   | SR 174 E. EMPIRE STREET OT CHURCH ENTRANCE              | 574          | 714           | 0.80                                       | 0.42              | Yes   | -140          | 19,561             |
| STATE HIGHWAY 49    | SR 49 W. BROAD ST/CEMENT HILL RD TO ELKS LODGE ENTRANCE | 518          | 604           | 0.86                                       | 0.44              | Yes   | -86           | 7,321              |
| STATE HIGHWAY 49    | SR 49 SR 20 TO COYOTE STREET                            | 1,007        | 1,100         | 0.92                                       | 0.36              | Yes   | -93           | 8,630              |
| STATE HIGHWAY 49    | SR 49 NEWTON RD TO JOHN BARLEYCORN RD                   | 390          | 423           | 0.92                                       | 0.60              | Yes   | -33           | 1,076              |
| WEST EMPIRE STREET  | W EMPIRE ST LE DUC ST TO S AUBURN ST                    | 173          | 445           | 0.39                                       | 0.60              | No  | -272          | 74,130             |
| WEST MCKNIGHT WAY   | West McKnight Way Freeman to Taylorville                | 1,167        | 873           | 1.34                                       | 0.39              | Yes   | 294           | 86,333             |
| GOLD FLAT ROAD      | GOLD FLAT RD HAWKE LN TO HOLLOW WY                      | 210          | 229           | 0.92                                       | 0.60              | Yes   | -19           | 352                |
| MCCOURTNEY ROAD     | McCourtney Road SR 20 Ramps to Mill Street              | 778          | 766           | 1.02                                       | 0.41              | Yes   | 12            | 145                |
| BENNETT STREET      | BENNETT ST HENDERSON ST TO OPHIR ST                     | 269          | 544           | 0.49                                       | 0.46              | No  | -275          | 75,807             |
| COYOTE STREET       | COYOTE ST CHURCH ST TO WASHINGTON ST                    | 463          | 157           | 2.94                                       | 0.60              | No  | 306           | 93,469             |
| EAST BROAD STREET   | E. BROAD ST MAIN ST TO SR 49                            | 75           | 160           | 0.47                                       | 0.60              | Yes   | -85           | 7,282              |
| OPHIR STREET        | OPHIR STREET HWY 174 TO BENNETT STREET                  | 326          | 437           | 0.75                                       | 0.60              | Yes   | -111          | 12,343             |
| SEARLS AVENUE       | SEARLS AVE RIDGE RD TO PERSEVERANCE MINE CT (SOUTH)     | 247          | 462           | 0.54                                       | 0.60              | Yes   | -215          | 46,057             |
| WEST BROAD STREET   | W. BROAD ST SPRING STREET TO CHIEF KELLY DR             | 243          | 249           | 0.98                                       | 0.60              | Yes   | -6            | 38                 |
| ZION STREET         | ZION ST DOANE RD TO ARGALL WY                           | 491          | 531           | 0.92                                       | 0.46              | Yes   | -40           | 1,604              |
| 43,730              |   | 44,141       |               | Model/Count Ratio = 0.99                   |                   | Percent Within Caltrans Maximum Deviation = 94% > 75% |               |                    |
|                     |   |              |               | Percent Root Mean Square Error = 23% < 40% |                   | Coefficient of Determination ( $R^2$ ) = 0.92 > 0.77  |               |                    |
|                     |   |              |               | Correlation Coefficient = 0.96 > 0.88      |                   |   |               |                    |