RTC Washoe Travel Demand Model

Development Documentation

Prepared by: Caliper Corporation

January 14, 2025

# Validation

Once the behavioral models were estimated and calibrated using survey data, Caliper ran the full model and compared outputs to traffic counts (2023 counts). This data provided a check on model performance in the base year and built confidence that the model can be used in the future.

The table below presents the percent difference and percent root mean square error, which are measures of how well the model matches counts in aggregate. The table further breaks down this metric by volume group. The model matches count closely both overall and by volume group.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Volume Group | N | Total Count | Total Volume | % Difference | %RMSE |
| 10000 | 517 | 2052000 | 2147510 | 4.65 | 69.33 |
| 25000 | 199 | 3160300 | 3152887 | -0.23 | 38.24 |
| 50000 | 57 | 1908600 | 1912780 | 0.22 | 18.69 |
| 100000 | 17 | 1199900 | 1285451 | 7.13 | 13.96 |
| 100000+ | 11 | 1509300 | 1527212 | 1.19 | 8.19 |
| All | 801 | 9830100 | 10025839 | 1.99 | 37.01 |

The second table presents the same metrics by HCM type. The model uses independent capacities for each of these roadway types, and this table makes sure each is performing well. Major collectors show large metrics, but with only two counts, this is not cause for concern.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| HCM Type | N | Total Count | Total Volume | % Difference | %RMSE |
| Arterial | 235 | 1865100 | 1807053 | -3.11 | 48.98 |
| Collector | 109 | 276800 | 210763 | -23.86 | 86.79 |
| Freeway | 252 | 4543800 | 4885856 | 7.53 | 25.41 |
| Local | 30 | 56600 | 61305 | 8.31 | 94.52 |
| MajorArterial | 173 | 3087000 | 3059609 | -0.89 | 35.8 |
| MajorCollector | 2 | 800 | 1253 | 56.62 | 148.27 |
| All | 801 | 9830100 | 10025839 | 1.99 | 37.01 |

In addition to aggregate checks, Caliper performed link-level validation using maps like the one shown below. In this map, red colors show where the model is higher than counts while blue show where it is lower. Green indicates that the deviation is within the maximum desirable deviation range. No model with useful sensitivity will achieve a green color for all links. These maps guide the review process by showing where errors are largest and suggesting the presence of network or other errors.

A map of a city

Description automatically generated

## Transit

Transit validation is done by checking total transit ridership to observed boardings and alightings. The table below shows unlinked trips (total boardings) for both model and observed. The observed boardings come from the 2024 APTA report.

Model: 18,490

Observed: 17,700

The model accurately predicts the aggregate level of transit usage.