

MEMORANDUM

To: Los Angeles County Metropolitan
Transportation Authority (LA Metro)

From: Iteris, Inc.

Date: June 4, 2018

RE: Metro Orange Line 4-quadrant Gates and Grade Separations Project
2025 Opening Year Traffic Volume Forecasting Methodology

This memorandum outlines the methodology for developing the a.m. and p.m. Future Year 2025 traffic volumes to be used in the VISSIM microsimulation model that will ultimately serve as the traffic analysis tool for comparing improvement alternatives for the Metro Orange Line (MOL).

The proposed project consists of three future year scenarios that include design changes at some of the MOL busway crossings including grade separations, roadway closures, and 4-quadrant gated intersections. The scenarios are described as follows:

- Future 2025 Opening Year Without Project – assumes no changes to MOL busway crossings
- Future 2025 Opening Year With Full Project – includes a 1-mile grade separated busway between Sepulveda Boulevard and Van Nuys Boulevard (including Kester Avenue) with 4-quadrant gated intersections at all remaining crossings. This scenario assumes Tyrone Avenue will be closed.
- Future 2025 Opening Year With Reduced Project – includes two standalone grade separations for Sepulveda Boulevard and Van Nuys Boulevard with 4-quadrant gated intersections at all remaining crossings. This scenario assumes Tyrone Avenue will be closed and Kester Avenue will have gated operation at the MOL crossing.

Future Without Project Volume Development

The 2016 Southern California Association of Governments (SCAG) Regional Transportation model was utilized to develop the Future Year 2025 traffic volumes. The following methodology was used:

Link volumes at each MOL crossing for the model's base year (2017) and horizon year (2040) were extracted for the a.m. and p.m. peak period. The difference in volumes represents 23 years of model volume growth at each crossing.

- The 23 years of traffic volume growth were factored down linearly to develop an annual average growth rate for each MOL crossing in the SCAG model.
- Cumulative 8-year growth rates (representing 2017 to 2025) were developed for the MOL crossing links.

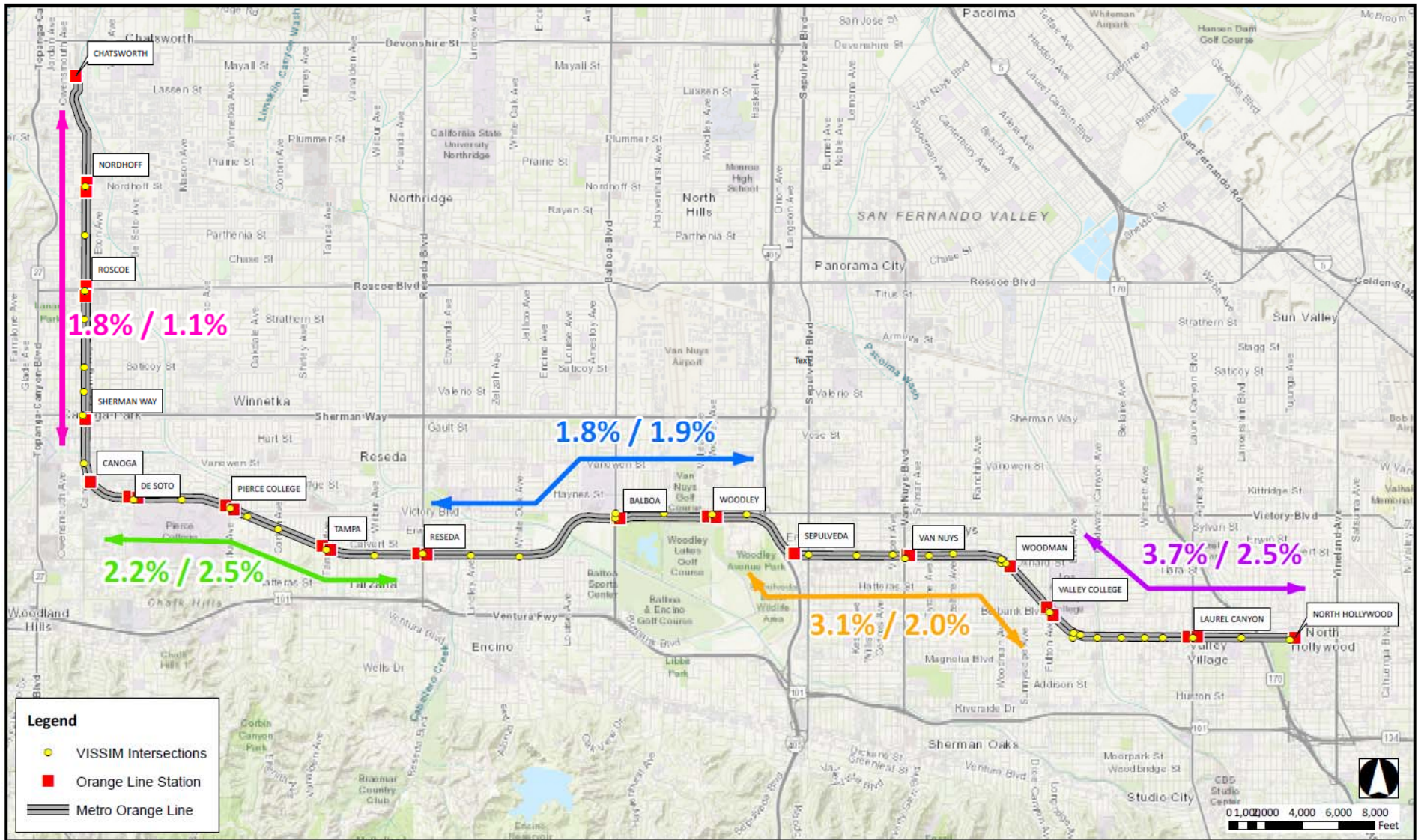
In analyzing these observed traffic growth rates along the entire MOL study area, similar trends were recognized for 5 distinct subareas. An average growth rate for all the links within each of the subareas was calculated and summarized in **Table 1**. The growth rates are displayed graphically in **Figure 1**. The cumulative

8-year growth rates were applied to the 2017 traffic counts to obtain future year 2025 turning movement volumes.

Table 1 – Traffic Growth Rates by MOL Subarea

| MOL Subarea | Average Annual Growth Rates (2017-2040 SCAG Model) | | 2017 - 2025 Total Growth Rates | |
|---------------------------------------------------|----------------------------------------------------|-------|--------------------------------|------|
| | AM | PM | AM | PM |
| Prairie Street to Vanowen Street | 0.22% | 0.14% | 1.8% | 1.1% |
| De Soto Avenue to Wilbur Avenue | 0.27% | 0.31% | 2.2% | 2.5% |
| Reseda Boulevard to Densmore Avenue | 0.23% | 0.24% | 1.8% | 1.9% |
| Sepulveda Boulevard to Woodman Avenue | 0.39% | 0.25% | 3.1% | 2.0% |
| Burbank Boulevard/Fulton Avenue to Tujunga Avenue | 0.46% | 0.31% | 3.7% | 2.5% |

**Figure 1 – MOL Future Volume Development
2017 -2025 Traffic Growth Rates AM/PM Peak**



Future with project volume Development

The MOL busway grade separations in the Future With Full Project and Future With Reduced Project scenarios, coupled by the remaining crossings which will be gated, present the possibility of shifts in existing traffic patterns on surrounding roadway crossings. Model runs using modified versions of the SCAG 2017 base year network representing changed conditions for each “with project” scenario, were compared to determine any potential dynamic shift in traffic on to other MOL crossing roadways in each peak hour.

An initial scrutiny of the 2017 base year network focused on the MOL busway corridor between Sepulveda Boulevard and Tyrone Avenue. As shown in **Figure 2**, a number of centroid connectors were added because Tyrone Avenue and Vesper Avenue were not being assigned any vehicles. A new model assignment was ran after these network changes were made.

Further modifications of the 2017 model network were introduced to represent the altered geometry for the Future With Full Project and Future With Reduced Project scenarios. Taking the posted speeds and peak volumes on the crossing roadways into consideration, a travel time calculation was applied to develop revised posted speeds representative of the change in travel time experienced by the vehicles for the With Project scenarios. **Table 2** shows the posted speeds on the crossing roadway links in the original SCAG model network and revised posted speeds that represent the travel time savings or costs under the “with project” scenarios. As shown, the coded speeds were rounded to nearest 5 mph in the model networks.

Figure 2 – Modified 2017 Base Year Model Network

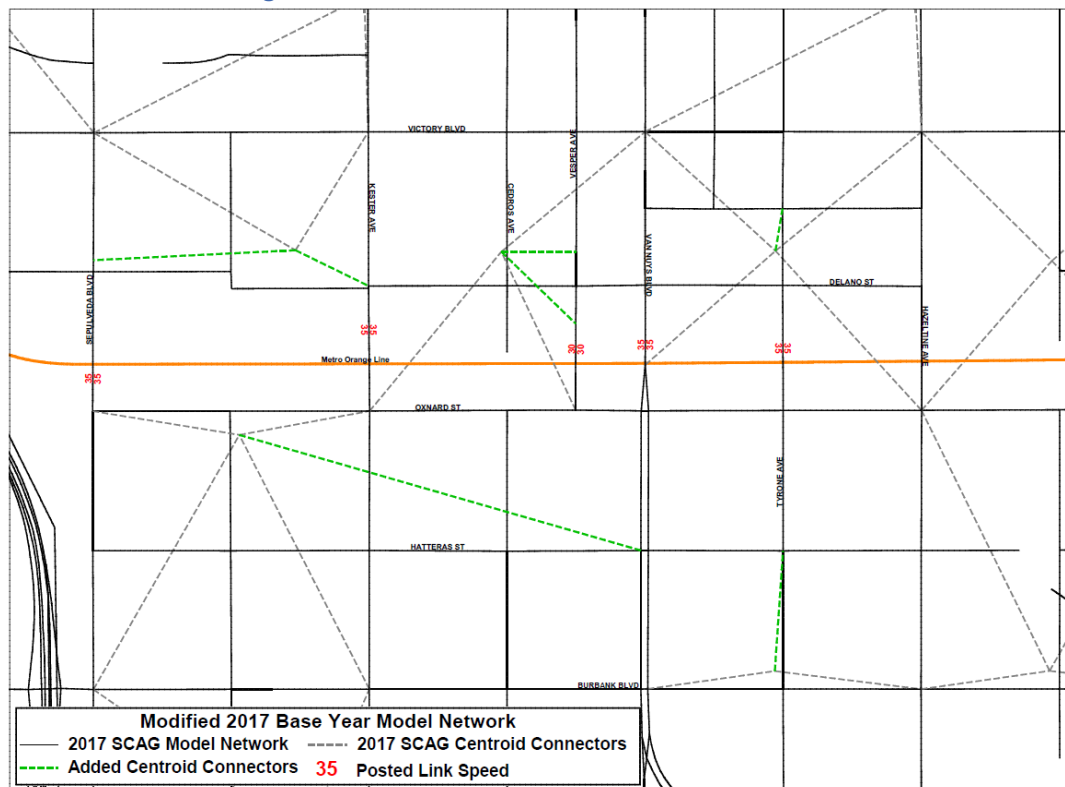


Table 2 – Posted Link Speeds for Future Model Scenarios

| MOL Crossing | Base Year SCAG Model | | | | Future With Reduced Project | | | Future With Full Project | | |
|---------------------|----------------------|--------------------|-------------|-----------------------|-----------------------------|---------------------|------------------|--------------------------|---------------------|------------------|
| | Link ID | AB/BA Posted Speed | Link Length | Existing TT (sec/veh) | Future TT (sec/veh) | Future Posted Speed | Coded in Network | Future TT (sec/veh) | Future Posted Speed | Coded in Network |
| Tyrone Avenue | 2756527 | 35 | 0.23 | 24 | n/a | n/a | n/a | n/a | n/a | n/a |
| Van Nuys Boulevard | 101761 | 35 | 0.07 | 7 | 6 | 39 | 40 | 6 | 39 | 40 |
| Vesper Avenue | 2689187 | 30 | 0.09 | 11 | 9 | 35 | 35 | 9 | 35 | 35 |
| Kester Avenue | 2756540 | 35 | 0.15 | 15 | 16 | 34 | 30 | 15 | 36 | 40 |
| Sepulveda Boulevard | 102129 | 35 | 0.12 | 12 | 12 | 37 | 40 | 12 | 37 | 40 |

Figure 3 and **Figure 4** graphically display the network changes made to the Future scenario models. The Tyrone Avenue link crossing the MOL busway was removed and the posted link speeds were revised, as listed in Table 2. After these network changes were executed, new model assignments were ran.

Figure 3 – Future With Reduced Project Model Network

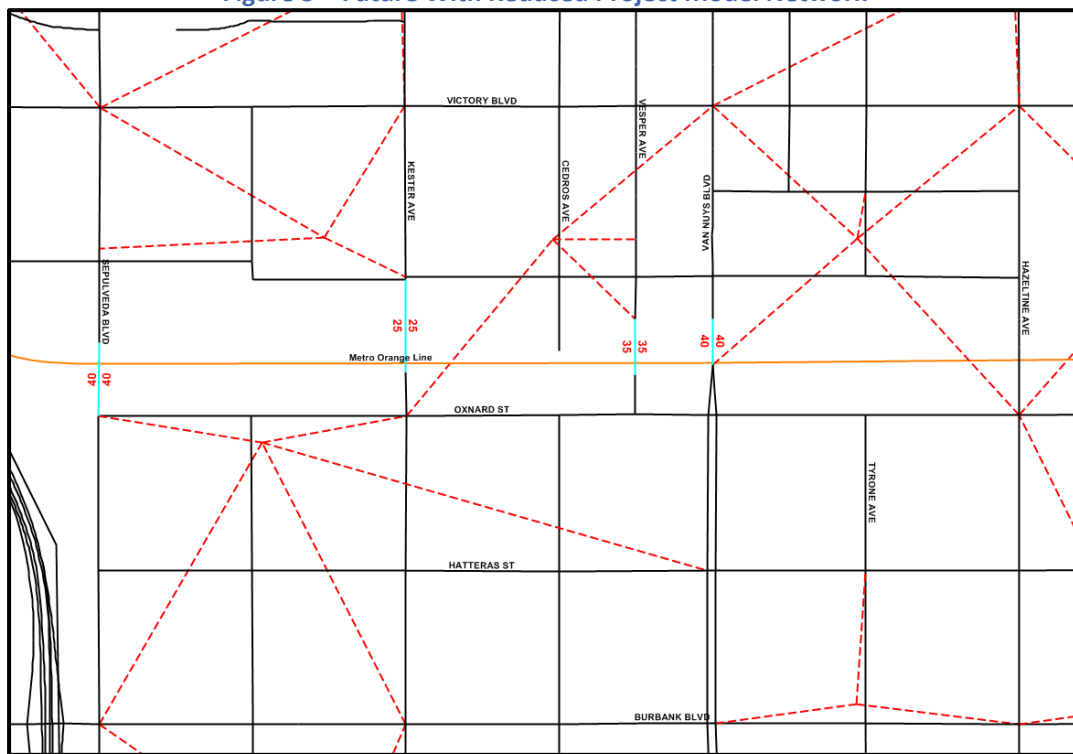


Figure 4 – Future With Full Project Model Network

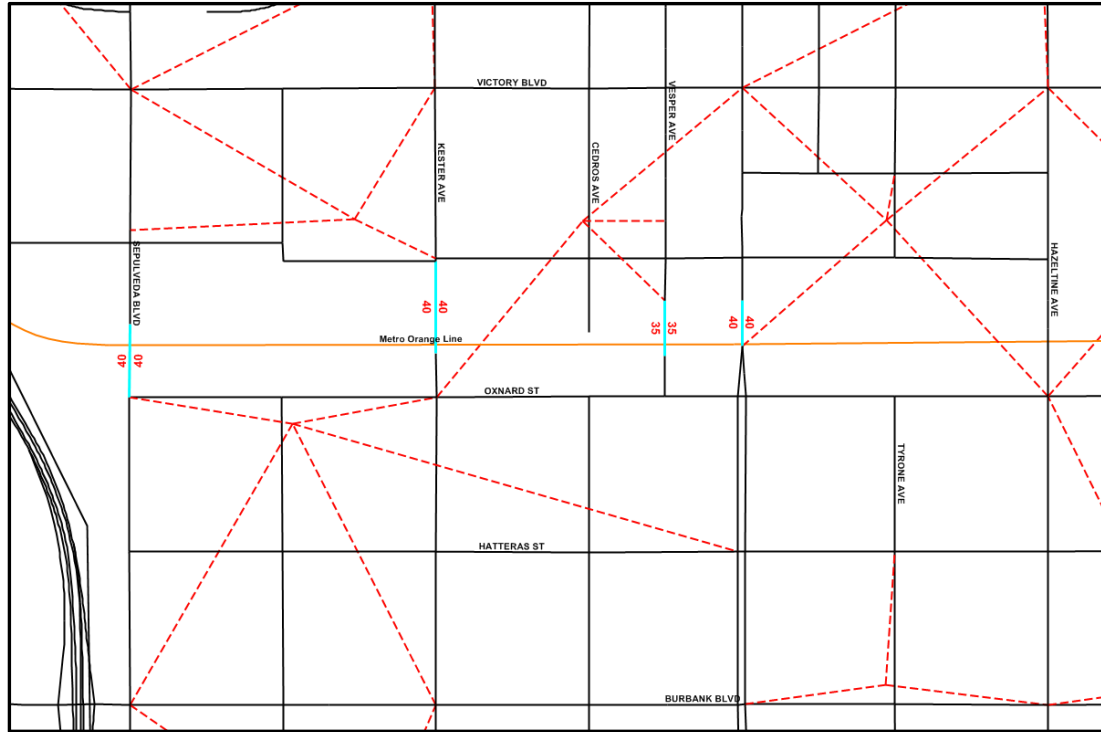


Table 3 compares the peak traffic volumes for the modified 2017 Base Year scenario to the two Future With Project scenarios. The findings are summarized as follows:

Future With Reduced Project Scenario

- Due to the closure of Tyrone Avenue at the MOL busway and the introduction of additional delays on Kester Avenue with gated busway operations, generally an 11% reduction in traffic volumes for both a.m. and p.m. peak hour.
- Van Nuys Boulevard is the preferred route for the shifting traffic, with a traffic volume increase of 5% and 6% for the a.m. and p.m. peak hour, respectively.
- The calculated travel time savings on Vesper Avenue did not make this crossing a more desirable route for peak traffic.
- Sepulveda Boulevard did not absorb as much traffic shifting compared to Van Nuys Boulevard, only increasing generally by 3% for the a.m. and p.m. peak hours.

Future With Full Project Scenario

- With Tyrone Avenue closed at MOL and the other crossings as grade-separated between Sepulveda Boulevard and Van Nuys Boulevard, relatively less shifting of traffic patterns occurred compared to the modified 2017 Base Year scenario.
- Traffic volumes on Van Nuys Boulevard increased by only one percent, while growth on Sepulveda was between 1-2 percent.
- Volumes on Kester Avenue, which will also be part of the grade separation, increased between 2-3 percent.

Table 3 – Peak Volume Comparison for Future Model Scenarios

| MOL Crossing | Modified Base Year Model | | Reduced Project Model | | Modified Base vs. Reduced Project Percent Difference | | Full Project Model | | Modified Base vs. Full Project Percent Difference | |
|---------------------|--------------------------|----------------|-----------------------|----------------|------------------------------------------------------|-------------|--------------------|----------------|---------------------------------------------------|-------------|
| | AM Link Volume | PM Link Volume | AM Link Volume | PM Link Volume | AM | PM | AM Link Volume | PM Link Volume | AM | PM |
| Tyrone Avenue | 16 | 22 | 0 | 0 | n/a | n/a | 0 | 0 | n/a | n/a |
| Van Nuys Boulevard | 1599 | 2164 | 1691 | 2302 | 5.4% | 6.0% | 1617 | 2185 | 1.1% | 1.0% |
| Vesper Avenue | 224 | 280 | 226 | 280 | 0.9% | 0.0% | 224 | 280 | 0.0% | 0.0% |
| Kester Avenue | 1234 | 1517 | 1114 | 1372 | -10.8% | -10.6% | 1268 | 1549 | 2.7% | 2.1% |
| Sepulveda Boulevard | 2323 | 3151 | 2395 | 3245 | 3.0% | 2.9% | 2339 | 3215 | 0.7% | 2.0% |
| <i>Overall</i> | <i>5396</i> | <i>7134</i> | <i>5426</i> | <i>7199</i> | <i>0.6%</i> | <i>0.9%</i> | <i>5448</i> | <i>7229</i> | <i>1.0%</i> | <i>1.3%</i> |

CONCLUSIONS AND RECOMMENDATIONS

In summary, the results of model runs for the two “with project” scenarios provide very intuitive outcomes. As a final check, traffic volumes across the full project corridor between Sepulveda Boulevard and Van Nuys Boulevard, were examined. This is shown in the last row of Table 3, labeled “Overall”. The full corridor, which will either have one long grade separation (Full Project) or two grade separations (Reduced Project) and gated cross-streets, intuitively is expected to show a slight increase in traffic volumes compared to the future no project scenario. This is mostly due to the potential north-south travel time savings for vehicles using the grade separations, compared to other corridors to the east and west, where all cross streets are expected to be gated. The overall values suggest that with the Reduced Project, the overall corridor is expected to attract slightly less than one percent traffic and with the more robust Full Project slightly more than one percent in each peak hour. Iteris recommends using the results in the above analysis for developing future cross street traffic volumes.