**Additional Results to**

**“Incorporating Autonomous Vehicles in the Traditional Four Step Model:
A Case Study in Dallas-Fort Worth”**

Felipe F. Dias, Gopindra S. Nair, Natalia Ruiz Juri (corresponding author),
Chandra R. Bhat, Arash Mirzaei

**TABLE A.1 Non-AV and AV-specific results**

(This table is to be read along with section 5.2 of the original paper.)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Result** | **Mode** | **Base – No AV** | **Base – High AV** | **Increased Trip Generation** | **No Change in VOT** | **Capacity Decrease** |
| Trips | Auto - Non-AV | 31,537,831 | 20,012,733 | 20,012,937 | 20,012,471 | 20,015,102 |
| Auto - AV | --- | 12,146,912 | 12,473,110 | 12,115,429 | 12,138,898 |
| VMTs | Auto - Non-AV | 284,954,405 | 185,978,835 | 184,918,753 | 184,817,284 | 179,886,669 |
| Auto - AV | --- | 119,216,118 | 120,693,312 | 115,543,844 | 114,983,408 |
| VHTs | Auto - Non-AV | 9,099,179 | 5,569,718 | 5,534,352 | 5,499,651 | 5,958,368 |
| Auto - AV | --- | 3,780,950 | 3,829,575 | 3,611,514 | 4,100,215 |
| Avg. TravelTime | Auto - Non-AV | 17.31 | 16.70 | 16.59 | 16.49 | 17.86 |
| Auto - AV | --- | 18.68 | 18.42 | 17.89 | 20.27 |
| Avg. TripDistance | Auto - Non-AV | 9.04 | 9.29 | 9.24 | 9.24 | 8.99 |
| Auto - AV | --- | 9.81 | 9.68 | 9.54 | 9.47 |

For all scenarios, AVs are associated with longer trips in terms of both time and distance than Non-AVs. We did not expect to see this effect in the “No Change in VOT” scenario, since that scenario directly assumes that AVs have the same values of time as Non-AVs. Notably, the difference between the average Non-AV and AV travel times and distances are smaller for the “No Change in VOT” scenario, but there still seems to be some residual difference between two modes. This is likely due to an assumption made in our extension of the mode choice model. NCTCOG’s original mode choice model was segmented according to several categories: income level, number of workers, number of adults, number of children, and, more importantly, number of vehicles – each trip type was segmented slightly differently. When implementing our extension, we assumed that households that were deemed “AV households” should not be segmented based on number vehicles in the household since a single AV could serve multiple household members simultaneously. All other segmentations remained, only number of vehicles was removed. This was done by copying the mode choice model from the highest level of vehicle ownership to all other vehicle ownership categories. This, combined with the higher sensitivity towards travel time (for the AV mode in the “No Change in VOT” scenario compared to the AV mode in the “Base – High AV” scenario) likely pushed travelers away from the Auto – AV mode to other modes (as evidenced by Auto-AV’s lower number of trips), leading to different geographic spreads of AV trips, ultimately generating slightly longer trips. This could also just be an odd non-representative numerical artifact resulting from the accumulation of slight differences across the multiple pieces of the model.