travel modelling group

MULTICLASS TOOL COMPARISON REPORT

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Comparison of Multiclass Tools with their Regular Counterparts

Multi-Class Road Assignment

To compare this assignment with the regular Toll Attribute Road Assignment, the 2016 Base Network was used to generate the AM time period network. The two assignments were run on the same network to ensure no differences. The Regular assignment was run using unmodified expanded TTS AM auto demand. The Multiclass was run with two classes, each using mode 'c' and each using half of the unmodified expanded TTS AM Auto demand. This way the total demand applied on the network was the same, even though it utilised multiple classes.

The results were then copied from the "Volumes and Times (on links)" worksheet in the "General/Results Analysis/Traffic" directory under the "Worksheets/Tables" category on EMME desktop into an Excel file. The links were compared to make sure the exact same links were in the network to double check whether there were any differences in the scenarios. Finally the following results were compared

- 1. Time on Link
- 2. Speed on link
- 3. Volume on link
- 4. Vehicle distance travelled on link
- 5. Vehicle hours travelled on link

As can be seen in Figure 1 and Figure 2, the comparison shows the exact same values for both assignments, thus ensuring that the assignment results are the same.



Figure 1 Travel time on auto links comparison for both assignments



Figure 2 Comparison of link volumes for both assignments

The time it took for each assignment cannot be compared directly as the MultiClass assignment used two classes and therefore would take longer. However, another assignment was done with a single class MultiClassRoadAssignment to compare directly to and the time are given in Table 1 below for all runs.

Assignment	Time Taken (mins)
TollBasedRoadAssignment	2.85
MultiClassRoadAssignment (1 Class)	1.87
MultiClassRoadAssignment (2 Classes)	3.80

As can be seen the single class assignment using the MultiClass tool is faster then the current assignment tool while providing the same results. This is likely due to the more efficient code inside the new tool.

MultiClass Transit Assignment

Similar to the road assignment testing, the 2016 network for the AM period was generated and the network was copied for each assignment to ensure no network differences. The regular assignment was run with unmodified expanded TTS AM transit demand (including DAT and PAT). The multiclass assignment was done with two classes, each using half of the unmodified expanded TTS AM transit demand to ensure the same total demand on the network.

The results were then compared on a segment by segment bases using the "Segment Results" worksheet in the "General/Results Analysis/Transit" directory under the "Worksheets/Tables" category on EMME desktop. The segment ID's were compared to ensure that the same segments exist in both of the networks. The following results were also compared to verify consistency in the results:

- 1. Time
- 2. Speed
- 3. Load Factor
- 4. Volume
- 5. Boardings
- 6. Alightings

The comparison, as seen in Figure 3 and Figure 4, show that the two assignments provided the exact same results, thus proving that they can be used as substitutes of each other.



Figure 3 Comparing the Boardings and Alightings at each segment on the two assignments



Figure 4 Comparing the volumes at each segment on the two assignments

The time it took for each assignment cannot be compared directly as the MultiClass assignment used two classes and therefore would take longer. However, another assignment was done with a single class MultiClass transit to compare directly to and the time are given in Table 2 below for all runs.

Assignment	Time Taken (mins)
V4FBTA	4.55
TMG Transit Assignment (1 Class)	6.08
TMG Transit Assignment (2 Classes)	10.18

Table 2 Comparison of Transit Assignment Run Times

As can be seen the single class assignment using the MultiClass tool is slightly slower then the current assignment tool while providing the same results. As the tool is capable of a lot more than multiclass assignment (putting out iterational data as well as Surface Transit Speed updating), the fact that it is slightly slower makes sense. However, TMG will continue to try to optimize the tool for faster transit assignment times.