



# TECHNICAL NOTE

|                 |                         |                         |        |
|-----------------|-------------------------|-------------------------|--------|
| <b>DATE:</b>    | 24 January 2020         | <b>CONFIDENTIALITY:</b> | Public |
| <b>SUBJECT:</b> | A49 VISSIM Model Review |                         |        |
| <b>PROJECT:</b> | Peel Hall               | <b>AUTHOR:</b>          | MJ     |
| <b>CHECKED:</b> | TL                      | <b>APPROVED:</b>        | CEW    |

## INTRODUCTION

WSP have been commissioned by Warrington Borough Council to provide technical advice regarding transport modelling for a development site at Peel Hall. As part of the development assessment a 2019 base Vissim microsimulation model of the A49 Corridor between A49 Winwick Link Road/Newton Road/ Winwick Park Avenue Junction and A49/ Retail Park Junction plus the M62 mainline at junction 9 has been constructed. A high level model review has been undertaken to assess the model validity and fitness for purpose. The findings are detailed in this Technical Note.

## MODEL REVIEW

### 1. Network Layout Coding

Network layout (numbers of lanes, lane widths, merge etc) have been checked against Google Map and Google Streetview and no major issues have been found.

### 2. Driving Behaviour Parameters

We notice some roads are coded inconsistently, for example at M62 J9, the EB onslip and WB offslip are coded with a link behaviour type of 203:Slip Roads while WB onslip and EB offslip are coded as 4. Mway 2. It should be confirmed if these parameters are based on the previous validated VISSIM model developed by AECOM.

**Response 2:** All link coding has been left as per the original AECOM model/s – there was a lot of different bespoke behaviours set up in that model and it seemed best to leave alone as we hadn't been involved in the original decision making processes.

### 3. Signals

Signals on M62 J9 should have two controllers from signal timing sheet while they have been coded in one controller in the model.

**Response 3:** This was judged to make no real material difference to the running of the signals at the junction and was considered best to leave as per the validated original model.

### 4. Speed Distributions and Speed Decisions

Sandy Lane W free flow left turn has a desired speed distribution of 30 mph whereas the posted speed limit is 20 mph.

**Response 4:** As the speed is set to the posted 20mph as soon as traffic goes around the corner onto Sandy Lane West, there must have been a good reason for this very short section (44m exiting the

roundabout, 22m approaching the roundabout) to do with calibration of the original model, quite possibly resultant of site observations in 2015. It was considered best to leave as per the original model.

### 5. Traffic Demand

Three vehicle classes: car, LGV and HGV have been defined in the model. In the AM peak, it seems the car demand has been doubled on one link, as shown in the screen shot below. Please check if this is an error.

**Response 5:** This was indeed an error on our part and has now been corrected.

| Count | No  | Name             | Link | VehComp(600) | Volume(0) | Volume(600) | Volume(1200) | Volume(1800) | Volume(2400) | Volume(3000) | Vr |
|-------|-----|------------------|------|--------------|-----------|-------------|--------------|--------------|--------------|--------------|----|
| 49    | 171 | Parking Lot 1072 | 203  | 2: Car       | 160.1     | 168.0       | 175.9        | 212.0        | 236.0        | 259.9        |    |
| 50    | 312 | Parking Lot 1072 | 203  | 3: LGV       | 40.0      | 44.0        | 48.0         | 60.0         | 66.0         | 72.0         |    |
| 51    | 41  | Parking Lot 1087 | 205  | 1: HGV       | 32.0      | 34.0        | 24.2         | 40.2         | 56.0         | 60.0         |    |
| 52    | 182 | Parking Lot 1087 | 205  | 2: Car       | 517.0     | 575.0       | 540.0        | 620.0        | 712.0        | 745.0        |    |
| 53    | 323 | Parking Lot 1087 | 205  | 3: LGV       | 41.2      | 42.4        | 46.6         | 56.9         | 67.2         | 76.9         |    |
| 54    | 221 | Parking Lot 1075 | 214  | 2: Car       | 0.0       | 0.0         | 0.0          | 0.0          | 0.0          | 0.0          |    |
| 55    | 154 | Parking Lot 1227 | 227  | 1: HGV       | 4.2       | 1.3         | 4.2          | 8.9          | 8.1          | 2.7          |    |
| 56    | 235 | Parking Lot 1150 | 227  | 2: Car       | 129.6     | 100.6       | 130.8        | 119.2        | 146.5        | 152.3        |    |
| 57    | 295 | Parking Lot 1227 | 227  | 2: Car       | 129.6     | 100.6       | 130.8        | 119.2        | 146.5        | 152.3        |    |
| 58    | 445 | Parking Lot 1227 | 227  | 3: LGV       | 0.0       | 0.0         | 0.0          | 0.0          | 22.0         | 0.0          |    |
| 59    | 451 |                  | 265  | 2: Car       | 70.0      | 70.0        | 70.0         | 70.0         | 70.0         | 70.0         |    |
| 60    | 37  | Parking Lot 1083 | 274  | 1: HGV       | 424.0     | 410.0       | 396.0        | 436.0        | 452.0        | 468.0        |    |

### 6. Simulation Parameters

All simulation parameters in the model are acceptable. The LMVR states the model outputs are the average over ten random seeds but it is not clear what seeds have been used. From the model setting it is assumed the random seeds used in the model are: 5, 10, 15...45, 50. Please can this be confirmed.

**Response 6:** This has now been updated in the amended LMVR

### 7. Public Transport

Bus routes and their departure times have been defined in the model. The bus timetables have not been checked against published schedules but it was noted that the departure times in AM and PM are the same.

**Response 7:** This is as per the provided AECOM model

### 8. Observation of Model Simulation Runs

We have checked the vehicle behaviours such as lane changing, overlapping etc and no major issues have been observed.

We have also undertaken a high-level sense check against Google typical traffic conditions.

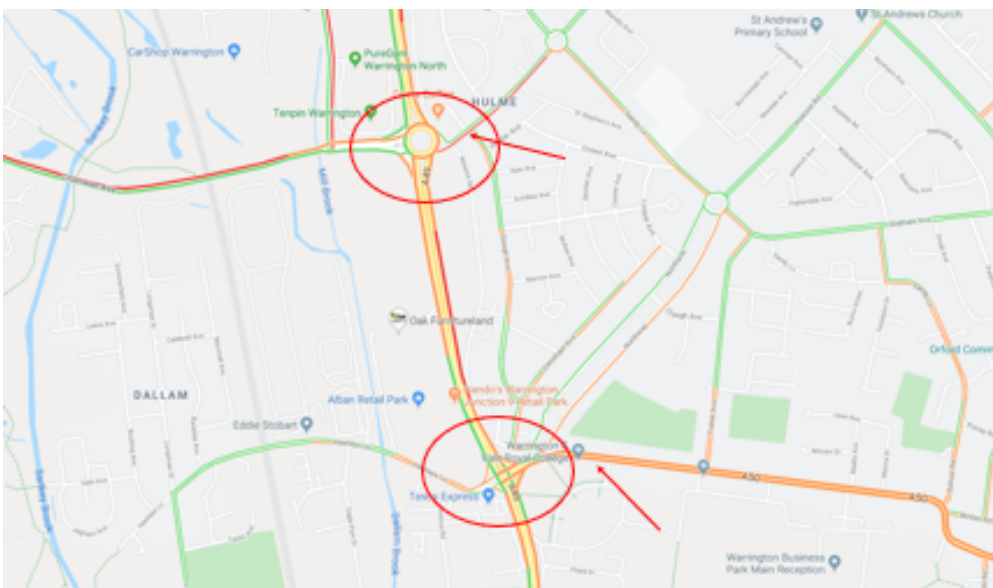
In summary:

- a. Google Traffic shows long delays on M62 eastbound mainline and the eastbound off-slip road in the AM peak, as shown below. However, the model does not really replicate the queues. We are aware that there are currently roadworks on the M62 in this area for the implementation of smart

motorways and therefore the local authority may be able to comment further on if this level of congestion is typical or just a product of temporary traffic management. **See summary**



- b. In both AM and PM, A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West Junction and A49 Winwick Road/ Nine Retail Park Junction are quite congested all through the peak times. The modelled queues are much shorter on Sandy Lane westbound and the A50 Long Lane westbound. These two roads along with M62 J9 are the main exits for vehicles generated by the proposed new development that this model will support so it is recommended to review the level of queuing and delay on these links in comparison to observed conditions because no journey time or queue comparison is currently included outside of the A49 corridor. **See summary**



- c. Significant queues have been observed on Northway in the AM model, which might be due to the potential double counting of demand we observed in Paragraph 5.

Response 8c: This is as a result of the double counting mentioned

If the demand is correct, we also recommend this link to be extended to show the real queue length and prevent latent demand.



## 9. Model Outputs

Both AM and PM models have been run using 10 seeds and the average outputs have been compared with the modelled results (turning flows, journey times and link flows) reported in the LMVR. There are some very minor differences, which could be due to Vissim version, but in general the results can be replicated.

## 10. Error Message

One error message is produced, again this might be due to the potential demand error identified in paragraph 5.

Warning      Vehicle input 235: Parking Lot 1150 could not be finished completely (remain: 106 vehicles).

## SUMMARY

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In summary this model has met the microsimulation modelling guidelines. Our main concerns are:

- A49 Winwick Road/ A574 Cromwell Avenue/ Sandy Lane West Junction, A49 Winwick Road/ A50 Junction, along with M62 J9 are the main exits for the vehicles generated by the proposed new developments. Compared with Google Traffic, the queues might be under estimated in the base model.

- Car demand on Northway (Link #227) seems to be doubled.

#### Summary Audit Response Comments

- In response to the over-arching comments regarding levels of queuing and delay – this was never a full model build and validation exercise, and hopefully isn't being audited as such. A best attempt was made firstly just to check that the model operation itself seemed reasonable, which it broadly was.
- After this, using the data available, a series of checks were carried out to compare it against the most recent data available. This largely consisted of turning count and journey time data, along with some signal data, so every attempt was made to make as minor tweaks and changes as was possible (so to keep it as true to the original as possible) in order to bring the model as much in line with this.
- As the model was provided as a previously approved model by Highways England, things like the level of delay caused by elements external to the model (i.e. M62 eastbound) were left as per the original modelling.
- Equally, in regard to the note about delays on entry links such as Sandy Lane etc - there is no data to suggest a need to change the original network coding, and the volume and journey time calibration has been fairly balanced considering it is made up of hybrid sources - it can only be assumed that any additional delay showing up on Big Data sources such as Google Traffic must be resultant of different/ additional/ suppressed traffic demand. As all future year testing will have its demand drawn from an approved strategic traffic model of the area, this seems to be a moot point in any event.