

## Bunn, Nick

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**From:** Patrick Thomas [REDACTED]  
**Sent:** 21 September 2023 14:20  
**To:** Bunn, Nick; Wakenshaw, Gareth  
**Cc:** Adrian Chadha; Moises Muguerza; alanlaw; Piechocki, Amrit (E,I&S); Spencer, Will (E,I&S); Tony Burrows; Evans, Mark (E,I&S); [REDACTED]  
[REDACTED]  
[REDACTED] Andrew Collinson  
**Subject:** Land NE of M42 J10 2023 - Baseline Transyt Validation Report & Consildated Modelling Strategy Note NH review  
**Attachments:** PAP-2021-0663OUT NH Baseline Transyt Validation and Consolidated Modelling Strategy review 21.9.23.pdf

Dear Nick

Further to the above, National Highways has completed its review. Please see the attached letter detailing our comments.

Kind Regards  
Patrick

**Patrick Thomas, Spatial Planner  
Operations Directorate (Midlands)**

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Our ref: **93439**  
Your ref: PAP/2021/0663

Nick Bunn  
TetraTech

Via email: 

**Patrick Thomas**  
**Spatial Planner**  
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Birmingham  
B1 1RN

21 September 2023

Dear Nick,

## **Review of Modelling Relating to the Development at Land to Northeast of M42 Junction 10**

National Highways (“we”) have been appointed by the Secretary of State for Transport as strategic highway company under the provisions of the Infrastructure Act 2015 and is the highway authority, traffic authority and street authority for the Strategic Road Network (SRN). The SRN is a critical national asset and as such we work to ensure that it operates and is managed in the public interest, both in respect of current activities and needs as well as in providing effective stewardship of its long-term operation and integrity.

This formal response letter has been prepared in response to two consultations, as follows:

- The Baseline TRANSYT Validation Report & supporting documents; and
- The Consolidated M42 Jn10 Modelling Strategy 2023-06-07 & supporting documents.

As such, comments in relation to both are provided in turn below.

### **Baseline TRANSYT Validation Report**

In relation to the Baseline TRANSYT Validation Report, National Highways welcomes the opportunity to review and comment on the following models & files associated with the application:

- M42 Jn10 and A5 – Exist With Ref Case Pen Way & Dordon v4 (Model)
- TRANSYT 2023 Baseline Validation Report
- MHC-110-23 Classified Junction Count – All Sites
- MHC-110-23 Signal Cycle Count Survey – Sites 1-3
- MHC-110-23 Queue Length Survey – All Sites (TT Edit)
- A5 Watling Street, Long Street, Gypsy Lane – Dordon Roundabout Drawing

The following text sets out our response based on an audit of the listed model & associated documents by ourselves and our consultants, AECOM. Based on these reviews we provide the following advice and guidance.

## 1. Traffic Flow Consistency between Nodes

Paragraph 3.4 of the TRANSYT 2023 Baseline Validation Report states that *“it was agreed with AECOM (NH’s review consultant) for the assessment of the 2022 TRANSYT on behalf of NH, that minor flow inconsistencies in the order of around 20 PCUs were negligible and could be ignored”*. However, the applicant should note that in previous correspondence NH have stated that the flows between zones should be consistent. This guidance was received from TRL in an email received by the applicant on 1<sup>st</sup> February 2023 and included in Appendix Q of the Tetra Tech Technical Note dated 3<sup>rd</sup> February 2023. The response from TRL stated *“what matters is that the total across the boundary is consistent, that is, the total flow entering the upstream matrix location(s) matches the total flow exiting the downstream matrix location(s)”*.

We note that there are a number of minor road accesses onto the A5 between the M42 Junction 10 and the A5 Dordon Roundabout that have not been included in the TRANSYT model, where it is likely that these junctions are likely to add or remove traffic from A5 mainline. Most of these accesses are located between the A5/Meridian Drive junction and the Dordon Roundabout. The applicant should ensure that turning flows at junctions are representative of the observed traffic counts (see point 2 ‘Traffic Flow Inputs’ below). Therefore, at the junctions to the east of the M42 where there are minor accesses between modelled junctions, minor flow differences between zones can be expected. However, to the west of the M42 there are no such sinks, so flows between the zones should be more consistent.

We would consider any flow differences on a case-by-case basis, but a starting point would be that a flow difference of under 10 PCUs could be considered insignificant where they are no obvious “sinks” in the network.

## 2. Traffic Flow Inputs

We note the following flow inconsistencies when comparing the flow spreadsheet (MHC-110-23 Classified Junction Count – All Sites.xlsx) and the TRANSYT model supplied:

- At node 2 (A5 / Danny Morson Way), the A5 Westbound left turn into Danny Morson Way has been modelled as 147 PCUs in the AM Peak, but is 179 PCUs in the traffic survey. In the PM Peak on the same movement, 147 PCUs has been modelled, but the spreadsheet shows a flow value of 95 PCUs.
- At node 4 (B5080 Pennine Way Northern Roundabout), the AM Peak flows on the Pennine Way northern arm (Arm 54) do not correspond to the flow spreadsheet. The flow to the overbridge is 422 PCUs in the model and 393 PCUs

in the spreadsheet, whilst the flow to the A5 slip road is 417 PCUs in the model and 422 PCUs in the spreadsheet.

- At node 7 (A5 Dordon Roundabout), the A5 Eastbound ahead flow in the PM Peak has been modelled as 1,212 PCUs, but the flow spreadsheet shows a flow of 1,112 PCUs. This could perhaps explain why the applicant has had to increase the intercept value on this approach (Paragraph 4.10 of the report). Please review the flow, as well as the give way parameters to ensure the model accurately represents the observed situation.

We therefore request the applicant to update the flow matrices to match the flow spreadsheet information that has been supplied.

### **3. Give way parameters at the A5 Dordon Roundabout**

In light of the flow issue highlighted above about the PM Peak flows on the A5 Eastbound approach to the Dordon Roundabout, we recommend that the applicant review the adjustment made to the Intercept value on Arm 91, Stream 1.

Please note that the slope and Intercept give way values calculated from ARCADY (JUNCTIONS) are for the approach and where there are multi-lane approaches, these values should be split across the lanes. However, where a single lane flares into two lanes on the roundabout entry, splitting the values equally between the two lanes may not be appropriate. This may be why issues arise in validating the AM Peak queues on the A5 westbound approach. Whilst increasing the Intercept on the nearside lane may be suitable, it may be appropriate to reduce the value on the offside lane accordingly.

Therefore, we suggest the applicant review the Intercept adjustment on the A5 Westbound approach to the Dordon Roundabout. Although the AM Peak changes to the PM Peak have been applied, it may be that this adjustment is not needed in the PM Peak. We consider that it is more important for the give way values to correspond to those calculated by ARCADY, but are then only adjusted on a peak by peak basis to ensure the base models results validate against the queue length observations.

### **4. Traffic Signal Data**

#### **4.1. M42 Junction 10**

At Controller Stream 2 (M42 West Side, A5 Eastbound Entry), the AM Peak observed Green Time for the Entry is 35 seconds (Cell AT261 of the spreadsheet), but Phase C in the TRANSYT model has only been given a green time of 29 seconds. At Controller 3 (Green Lane Entry), there are also some differences with the entry green time compared to the observations.

As the applicant has tried to match the green time on each approach with the observed values, we suggest it is confirmed that the green times for these nodes have been inputted as intended in order to match the observations.

In the PM Peak, there are minor differences with the green time on the roundabout entries on Controllers 3 (Green Lane) and 6 (Trinity Road). All the other entries see the TRANSYT green time match the observation, however these two entries are different.

We therefore suggest the applicant confirm whether there a reason why the green time values have been changed.

#### 4.2. A5 / Birch Coppice (Controller 7)

At Controller 7 (A5 / Birch Coppice) in the AM Peak, the Birch Coppice phases (D and E) seem to be getting less green time than was observed. We think this is due to a couple of reasons: the first is that the applicant has given Stage 2 more green time than observed (17 seconds in the TRANSYT as opposed to 15 seconds in the observations) and the second is that the observations indicate that the Interstage between stages 4 and 1 is not as long as the applicant has modelled. The applicant has determined the intergreen between Phases G and B to be 11 seconds based on safety calculations, which is correct. However, the applicant's observations indicate it runs with a shorter intergreen, assumedly due to no pedestrians being present on the crossing at the end of the green time. The applicant's observations indicate that Phases A and B nearly always start at the same time. With the duration of Stage 1 fixed at the observed green time of Phase B (40 seconds), it means that the green time for Phase A (A5 Eastbound Ahead) is greater in the model than observed (69 seconds versus 61 seconds). Although the queue length validation on this arm is reasonable, over-estimating the green time may mean that other capacity parameters, such as Saturation Flows are not accurate. There is a similar issue in the PM Peak. We therefore suggest the applicant review the signal timings at this junction to ensure they are as accurate as possible.

A possible solution to improve the similarities between the observed and modelled signal timings could be to reduce the Stage 2 duration by 2 seconds to match the observations and then looking to reduce the Phase G to B intergreen to better match the observations.

#### 4.3. A5 / Core 42 (Controller 8)

It has been difficult to see how the signal timings for this junction have been determined from the signal data provided. we recommend the applicant set out how the stage lengths have been determined and how the frequency of the demand dependent stage has been determined, both linking back to the signal data provided.

Rather than use the "Run every N cycles" feature, it may be more appropriate to use the "Probability of running (%)" feature instead if the number of occurrences the stage gets called is not a whole number.

Please also review the signal data to confirm what happens to the timings when the intermittent stage is not called. The TRANSYT model is currently set up exclude skipped time (i.e. the cycle time shortens). If the junction is under MOVA control, the cycle time

will vary, so it is probably likely that the time will be skipped and the cycle time will be shortened. However, it may be worth confirming that the green time isn't reallocated to adjacent stages. Please refer to section 24.8 of the latest TRANSYT 16 user guide for more information.

The signal data supplied by the applicant suggests that in both peaks Stage 2 is not called every cycle, so should this also be an intermittent stage? Approach 3g (Phase C) in Stage 2 is not called as often as Approach 3a and 3b (Phase B) in Stage 1. Also, some green durations of Phase B are greater than the average cycle time, suggesting that it runs for more than one cycle when the other two stages aren't demanded during a specific cycle. National Highways welcomes the opportunity to review and comment on the following models & files associated with the application:

- M42 Jn10 and A5 – Exist With Ref Case Pen Way & Dordon v4 (Model)
- TRANSYT 2023 Baseline Validation Report
- MHC-110-23 Classified Junction Count – All Sites
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## **Conclusions**

Overall, the reporting is well presented and the identification of issues is clear and understandable. However, there are still some significant concerns regarding routeing and coding to be addressed. At present the TRANSYT model cannot be accepted National Highways until all outstanding issues have been addressed.

## **Consolidated M42 Jn10 Modelling Strategy**

### **Paramics**

Based on our review of the Consolidated Modelling Strategy note, we note that the modelling approach has previously been agreed with National Highways. As such, we have no further comments to make. We also note that use of the modelling has been transferred from Paramics to TRANSYT as agreed, although this has yet to be signed off. Hence, our comments in relation to the baseline TRANSYT validation report contained within this letter response.

We note the concerns raised by SCC that the base year flows in the Paramics model may influence the routeing of the committed traffic. However, Vectos stated the following points:

1. the model has limited route choice;
2. the A5 is classed as a Major road so is more attractive in Paramics making route choice switching less sensitive;

But most importantly:

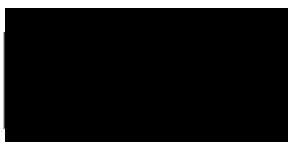
3. the Demand flows are taken out of a model run with no congestion (i.e. running the model with 50% of demands and double the answers), which ensures traffic (including Committed Development demands) uses the preferred route despite any congestion that may be seen in a 100% run.

We note that SCC were satisfied with the responses provided and as such National Highways have no further comments to add on this.

### **Trip Generation**

We have reviewed the development generated traffic flow as presented in Figure 21 & 22 of the Consolidated Modelling Strategy Note dated 7<sup>th</sup> June 2023. Based on our review, we note that the attraction flow to the site in the PM peak (as presented in Figure 22) is significantly lower than that which was agreed in the last version of the Modelling Strategy Note (dated 18 March 2022). Based on this, we advise the applicant to review and confirm the trip generation adopted in the model is presenting the agreed traffic flow generation for the site.

Your sincerely



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