A41 - Oxford Road

Bicester

Linsig Report

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Version 2

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1. Introduction and Scope

Green Signals Consulting Ltd have been engaged by Oxfordshire County Council to assess two Linsig models of the A41 Oxford Road network in Bicester, covering four traffic signal junctions.

In total, two models were provided, a Base and Proposed model, along with a Transport Assessment for a development, and the controller schedules for three of the existing junctions.

The scope of works was to assess the accuracy and suitability of the Linsig Models, compared against the existing sites and improvements outlined in the Transport Assessment. No other checking of the Transport Assessment has been undertaken.

Limited drawings of the existing sites were received and no controller schedule for the most northerly junction was received. Google Street View and aerial views were used to compare the plans and designs in the Transport Assessment and Linsig model, however the Google Street Views were last updated during a period of construction at these junctions. Two plans, one showing the proposed works along the route including the Southern-most junction and Lakeview Drive, and one drawing showing further proposed changes to Lakeview Drive have been received and reviewed. These relate to the Base Model and Proposed model respectively.

No site visits have been undertaken, so where there is uncertainty, this has been documented.

2. Results of Assessment of Linsig

Both models are similar, other than the changes highlighted in the Transport Assessment. There are a number of problems with the modelling, most of which affects both models. Both have two significant warnings in the Linsig Error View:

- Give Way Lane J2:4/1 has no opposing lanes specified. This is incorrectly configured and will affect the result, giving an unrealistically high capacity for this approach. This should be corrected.
- Matrix Estimation indicates that not all turning counts have been entered. If Matrix Estimation is being used, this should be completed. Otherwise, it would be prudent to remove the remaining data to avoid confusion or mistakes.

There are a number of other warnings relating to sliver queues, however these have been checked and do not pose a significant problem.

Where it has been possible to measure lane widths from scale plans, the lane widths used in the calculation of saturation flow appear to be consistently wider than the measured lane widths. Although at the scale shown in some plans, it is hard to be accurate, the difference appears to be greater than 0.5m on almost all Oxford Road lanes. This will result in an over optimistic calculation of saturation flows in both models.

Use of lane connectors to allow weaving will allow overly optimistic distribution of traffic flows and allows inappropriate route selection. If / where lanes are not immediately available at the exit of the previous junction, intermediate exit lane lanes may be required to accurately model lane and route choices. Alternatively, route flows may need to be manually set to manage traffic flows on weaving connectors. If this is done, the weaving flows should ideally be based on observed figures.

Lane J2:11/1 only links to Lane J3:2/1. This may be correct, however it limits traffic assignment in Lane J2:11/1. If this is accurate, the difference between the Base and Model appear correct; if this is not accurate, then some of the benefit of the mitigation is artificial.

Mean cruise times on many link connectors seem higher than would normally be expected, particularly short link connectors. This could result in a distortion of progression through the network, and making the timings unreliable for CLF in particular. This should not have an impact on overall capacity results, but may make queue length and delay values less accurate.

Saturation flows are generally higher than would normally be expected. In particular, where there is only one lane serving any given destination, the lane should be treated as a nearside lane in the saturation flow calculations. This is because slow vehicles will delay the entire route flow, unlike multiple lane / route choice approaches, where faster vehicles are able to overtake in the offside lane.

Arm J1:4 Oxford Road (nb) has no pedestrian crossing across it, despite signalled crossing across southbound. This may be accurate, but it would be unusual.

Controller Specific Comments

Controller 1

No controller specification or design is available to check the model against.

Controller 2

As highlighted in the error warning, J2:4/1 is configured as give way, but opposing lanes have not been entered for the movements to J1:1/1 or J1:1/4.

Two phase delays have not been included in the Linsig model.

Controller 4

Phases I and J do not match controller configuration, although they are not used. The controller schedule shows them as dummy phases for all red control, but shown in Linsig as left turn filters.

There are some other minor inconsistencies in staging between controller specification and Linsig, regarding Phase F in Stage 1 and 2, however the sequence used is appropriate.

3. Conclusions and Recommendations

Both models appear largely accurate, however there are a small number of errors that will have an effect of the overall results. Although the results look reasonable, the errors create an unacceptably high margin of error, meaning that the results could not be relied upon.

The geometric data within the model, such as lane widths, has only been checked against the proposed works drawings for the Base and Proposed mitigation, to the extents of those drawings. Neither has the controller operation of the northernmost junction within the network been checked. While the phases and stages used look reasonable, we cannot guarantee that the Base Model fairly represents the existing sites.

We would recommend that the errors in the model be corrected and the modelling resubmitted.