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Rebuttal Proof of Evidence on Transport of Mr J Wilkinson

Project No: ITB12212
Project Title: Lane to the East of Downend Road, Portchester
Title: Rebuttal Proof of Evidence on Transport of Mr J Wilkinson
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SECTION 1 Qualifications, Experience and Scope of Evidence

1.1.1 My name is Jon Wilkinson. I have worked in the field of traffic engineering and transport planning for some 19 years, joining i-Transport LLP in mid-2014. I am an Associate Transport Planner of i-Transport LLP (based in the Manchester office). I am a Member of the Chartered Institute of Highways and Transportation (MCIHT).

1.1.2 I have particular expertise in traffic signal junction modelling and design, with 16 years' experience of using LinSig modelling software. I was initially trained in LinSig in 2005, by JCT Consultancy, the owners and developers of the software. With further software upgrade training course in 2008, also by JCT Consultancy, and via online information. I have continued to keep up to date in the subsequent years of guidance on model situations and support provided by JCT Consultancy.

1.1.3 I have worked on the modelling of existing traffic signal junctions, as well as the design and modelling of new or junction upgrades to traffic signals. These schemes range from shuttle working arrangements on narrow bridges to the design and modelling of large motorway junctions.

1.1.4 Whilst I did not create the original junction model of the Downend Road bridge, I have carried out a full audit of the LinSig model and have determined that the model represents the proposed layout, including robust parameters, such as the saturation flow on the northbound approach being based on a steeper gradient that was subsequently measured. In addition, I have reviewed the JCT Audit (Appellant SoC Appendix 13), and agree the matters raised have subsequently been addressed. The model is therefore an appropriate assessment of the signal scheme over Downend Road bridge.

1.1.5 The evidence that I provide is true and has been prepared, and is given in accordance with, the guidance of my professional institution. I confirm that the opinions expressed are my true and professional opinions and are provided to the inquiry irrespective of by whom I am instructed.

Context and Scope of Evidence

1.1.6 This Rebuttal Evidence is provided to address transport modelling matters raised by Mr Lewis of Glanville Consultants who is acting on behalf of FBC. In particular, this Rebuttal Evidence considers Mr Lewis' LinSig modelling of the proposed signalised shuttle working over Downend Road Bridge.

SECTION 2 Inputs to the LinSig Model

2.1 Extended Intergreen

2.1.1 The inclusion of an 18 second intergreen period for cyclists (TW PoE 3.6.29 (6)) is very conservative and could be much lower, as the cyclist would not need to completely clear the bridge before opposing traffic could begin to move, without causing a safety issue. This assessment has also assumed that each and every cyclist will trigger the need for the extended intergreen period, which will not be the case.

2.1.2 With a low cycling demand of 10 cyclists in the peak hour, this would result in a cyclist being present in one of every 6-7 cycles on average. During these cycles an extension to the intergreen may be needed. Therefore for 5-6 cycles (c.85%) of the junction, no cyclists will be present and the intergreen would be 9 seconds, based on the TSM intergreen period (CD8.16 – Table 6-1). Assuming the intergreen extension is always required when a cyclist is present, this would result in an average intergreen period of 10.25-10.50 seconds across the peak hour period. The use of a 10 second intergreen period in the model is therefore appropriate.

2.1.3 The Sensitivity Test assessment of an average 11 second intergreen, presented in Table 3.5 of Mr Wall's Proof of Evidence, is a very robust assessment of the operation during the peak hour period.

2.2 Detection for Cyclists / Slow Moving Vehicles

2.2.1 The inclusion of a detection system for cyclists and slow moving vehicles will be included at the proposed signal scheme, which will ensure that the above extended intergreen period is only called when required, while other periods will be significantly shorter, at the standard 9 seconds.

2.3 Inclusion of Detection System at Signals

2.3.1 The traffic signals are likely to include a vehicle detection system, such as MOVA, that will detect approaching vehicles and potential queue lengths on Downend Road. MOVA allows the length of green time to vary for each cycle throughout the day and helps to maximise the operational capacity of a junction. LinSig models a fixed cycle throughout the assessment period and does not reflect the benefits of including MOVA, with the variable timings based on the demands per cycle. The actual operation of the signal scheme is therefore likely to be better than the LinSig model presents.

SECTION 3 Signal Scheme with Pedestrian Crossing

3.1 Intergreen Period

3.1.1 Mr Lewis has presented a LinSig model of a potential scheme incorporating signal controlled pedestrian crossings to both the north and south of the bridge. In this model, Mr Lewis has included a 16 second intergreen period between the opposing vehicle stages and between the vehicle and pedestrian stages, in every cycle during the peak hour period.

3.1.2 Given the low level of demand for cyclists and the inclusion of detectors at the signal scheme, a much more realistic value for modelling purposes would be between 10 and 11 seconds. The inclusion of a 16 second intergreen period every cycle is both unnecessary and could be unsafe (TSM para 6.5.6) resulting in long periods of inactivity across the bridge during intergreen periods, leading to driver frustration and likely instances of red light violations.

3.1.3 The model produced Mr Lewis therefore significantly underestimates the operational capacity of the signal scheme and presents conditions that would not be replicated on the ground.

3.2 Pedestrian Phases

Pedestrian Green Time

3.2.1 The LinSig model produced by Mr Lewis includes pedestrian crossings to both the north and south of the bridge. The model includes a minimum pedestrian green time of 8 seconds at both crossings.

3.2.2 Downend Road is c.6.4m wide to both the north and south of the bridge. The length of time required to cross at these locations, based on a pedestrian walking speed of 1.2 m/s, would be 5.3s. Rounded up this would mean the green time required for pedestrians to cross Downend Road would be 6 seconds, rather than the 8 seconds used.

3.2.3 This excessive green time for pedestrians (on top of an 8 second pedestrian to traffic intergreen period) will result in the model underestimating the operational capacity of the signal scheme.

Pedestrian Demand

3.2.4 Mr Lewis' LinSig model has assessed that the pedestrian crossings will be called every cycle. In reality, the number of pedestrians that may want to cross at these points will be relatively low, with demand of c.10-20 pedestrians in the busiest hour. Pedestrian movements outside of this peak time are expected to be significantly less. The pedestrian crossings would therefore more likely operate on an on-demand basis, with the pedestrian crossings only being called when there is a pedestrian is waiting to cross.

3.2.5 With a cycle time of 120 seconds, presented in Mr Lewis' LinSig model, this would equate to 30 cycles in the peak hour. With a maximum pedestrian demand expected to be around 20 pedestrians in an hour this would result in a worst case, where only a single pedestrian crosses during each call of the pedestrian crossing, of one signal cycle every third cycle where the pedestrian crossings would not need to be called, allowing addition green time for vehicle traffic, improving the operational capacity.

3.2.6 The inclusion of the pedestrian crossings every single cycle will also result in the model underestimating the operational capacity of the signal scheme. I conclude that Mr Lewis' model does not properly assess the likely conditions at the junction if a pedestrian stage were to be included.