Hampshire County Council

REBUTTAL FROM JONATHAN MUNDY IN RESPECT OF HIGHWAYS AND TRANSPORTATION

IN RELATION TO THE

Outline Planning Permission For The Demolition Of Existing Buildings And Development Of Up To 75 Dwellings, Open Space, Vehicular Access Point From Newgate Lane And Associated And Ancillary Infrastructure, With All Matters Except Access To Be Reserved. Land At Newgate Lane (North) Fareham.

PLANNING REFERENCE P/18/1118/OA

APPEAL REFERENCE APP/A1720/W/20/3252180

AND

Outline Planning Permission For The Demolition Of Existing Buildings And Development Of Up To 115 Dwellings, Open Space, Vehicular Access Point From Newgate Lane And Associated And Ancillary Infrastructure, With All Matters Except Access To Be Reserved. Land At Newgate Lane (South) Fareham.

PLANNING REFERENCE P/19/0460/OA

APPEAL REFERENCE APP/A1720/W/20/3252185

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List of Contents

Sections

Qualifications and Experience and Scope of Evidence 2
Delay at Newgate Lane Toucan crossing.....3
Cumulative delays……..5
Right turn at signal junction……..……..…8
Speed measurement data……...…….……...9
Conclusions.……..……11

1. Qualifications and Experience and Scope of Evidence

1.1 My qualifications and experience are set out at page 2 of my Proof of Evidence (Appeal Ref APP/A1720/W/20/3252185)

1.2 My evidence considers the transport related matters which are the subject of this Inquiry.

1.3 In the absence of Nick Gammer, I shall be covering the signalised elements (traffic signal junction and Toucan crossing) including traffic signal modelling, Ken Dudley will be covering the general Transport Planning aspects with Chris Whitehead providing evidence on BCR matters.

1.4 My rebuttal considers the Proof of Evidence (FL&BH 3.5, item 4.8 and Appendix B table 2-1) of Mr Patel of SWECO and Updated Proof of Evidence of Mr Jones of Pegasus Group (FL&BH 2.5, items 2.11, 2.16, 4.5, 4.7, 4.10, 4.12, 4.14 and 4.19).

1.5 Based on the above, my rebuttal considers the following issues:

- Delay at Newgate Lane Toucan crossing
- Cumulative delays
- Right turn at signal junction
- Speed measurement data

2. Delay at Newgate Lane Toucan crossing

2.1 Mr Patel states in section 4.8a of his Proof of Evidence

> *"LinSig as a modelling tool becomes ineffective when overcapacity. LinSig modelling is also typically used to assess capacity and queue lengths whereas micro-simulation modelling packages such as VISSIM provides a more detailed and accurate assessment of journey time and delay."*

2.2 VISSIM is not the appropriate software for calculating delay at a standalone Toucan crossing or traffic signal junction. VISSIM is typically used to model networks. The industry standard software package used to model an individual Toucan crossing is Linsig. It should be highlighted that the Appellant has chosen to assess the delays associated with the traffic signal junction with Linsig software and not VISSIM.

2.3 Mr Patel states in Section 4.8a of his Proof of Evidence that VISSIM and not Linsig is the correct software to use. This is contradicted in Mr Jones' Updated rebuttal proof Sections 4.1 and 4.2

> *"4.1 It is my view that decision making for planning applications and appeals that considers the assessment and mitigation of development schemes to avoid unacceptable or "severe" impacts on the operation of the local highway network should be informed via the normal industry standard way of junction capacity modelling."*
>
> *"4.2 This approach typically uses industry standard junction modelling software programmes such as LinSig Junctions 9, and where appropriate micro-simulation modelling such as VISSIM. These junction modelling software programmes are used to assess the impact of the appeal schemes proposed for an agreed design year with and without the traffic associated with the development scheme with consideration to the changes in the operational capacity, queues and delays of the junctions assessed. Mitigation is proposed where the changes that occur as a result of the scheme are deemed unacceptable in terms of highway safety, or the residual cumulative impacts on the road network are forecast to be severe."*

Mr Jones states that both Linsig and VISSIM software packages are used to model delays. The industry standard software used to model a standalone Toucan crossing is Linsig.

2.4 In Mr Patel's Proof of Evidence Appendix B table 2-1 summarises the VISSIM delays associated with the Toucan crossing. The delays derived from the VISSIM model are incorrect and should be discounted.

2.5 The saturation flows used in the VISSIM model are unrealistic based on the geometry of Newgate Lane at the crossing. The Newgate Lane northbound saturation flows used in the VISSIM model at the Toucan are 2150 Passenger Car Units (PCUs) in the AM peak and 2088 PCUs in the PM peak. The saturation flows used in VISSIM in the southbound direction are 2178

PCUs in the AM peak and 2205 PCUs in the PM peak. In this situation the saturation flows used in Linsig are derived from the width of the approach lane. To achieve such high saturation flows as used in the VISSIM model would require the lane width to be some way in excess of 5.0 metres. This falls outside of the scope of the empirical data used to derive the saturation flows. As a result the delay results provided by the VISSIM model at the Toucan cannot be relied on.

2.6 Based on the removal of the centre refuge the lane widths at the crossing would be 4.9 metres. The saturation flows used in Linsig should be 2105 PCUs per hour in both directions. In table 1 below are the AM peak results for Newgate Lane based on 2105 PCU per hour saturation flow in both directions.

AM peak	75 dwellings			115 dwellings			190 dwellings		
	Queue (PCUs)	Delay (seconds)	DoS	Queue (PCUs)	Delay (seconds)	DoS	Queue (PCUs)	Delay (seconds)	DoS
Newgate Lane northbound	43.9	18.3	92.6%	44.5	18.4	92.7%	45.2	18.8	92.9%
Newgate Lane southbound	5.7	3.5	40.7%	5.8	3.6	41.5%	5.9	3.6	42.7%

Table 1

PCUs = Passenger Car Units

DoS = Degree of saturation where a value over 90% indicates it is over capacity

2.7 The results in table 1 indicate that the average delay experienced by each northbound driver in the AM peak would be around 18 seconds. The degree of saturation exceeds 90% throughout which indicates that Newgate Lane would be over capacity during this period. This demonstrates that the Toucan crossing would have a material impact on capacity on Newgate Lane.

2.8 These levels of average delay on Newgate Lane northbound in the AM peak clearly demonstrate that the introduction of a Toucan crossing in isolation would have a material impact on delay.

3 Cumulative Delays

3.1 In section 2.11 of Mr Jones' Updated Proof of Evidence it is stated

> *"….that it is not appropriate to 'add' delay to provide a cumulative delay value accounting for both highway improvement schemes. I concur with this view."*

3.2 The distance between Toucan and traffic signal junction would be ½ kilometre. At this distance the traffic signals and Toucan crossing would operate independently of each other. The maximum time that pedestrians and cyclists wait at standalone crossings in Hampshire is 40 seconds. The modelled cycle time at the signal junction is 2 minutes. To co-ordinate the traffic signals and Toucan would require the same cycle time to be used. It would be unacceptable to make pedestrians and cyclists wait for up to 2 minutes at the Toucan crossing as it would significantly increase the likelihood that they would attempt to cross between vehicles. Operating independently the results calculated in the Linsig modelling are the average times that drivers would be delayed at each location.

3.3 As already explained in section 2 the average delay of 2 seconds northbound in the morning peak at the Toucan is incorrect (Mr Jones Updated Proof of Evidence section 4.5). When the actual saturation flow is used and applied to the Linsig model the average delay experienced by each northbound driver in the morning peak would be around 18 seconds (table 1). These durations are considered to be significantly greater than the 2 and 3 seconds (section 2.16 table 1) indicated by the Appellant.

3.4 In section 4.7 Mr Jones refers to delays at the signal junction which are incorrect. The stated delay of 11 seconds northbound in the morning peak severely underestimates the actual delays that based on my analysis would be in excess of 60 seconds (see section 3.5 and Table 3). The average delays for each vehicle as calculated by the Appellant are set in table 2.

AM peak – Average delay per vehicle (seconds)

	75 dwellings	115 dwellings	190 dwellings
Newgate Lane East northbound	10.9	11.0	11.0
Newgate Lane East southbound	6.3	6.7	7.4
Old Newgate Lane	64.8	67.8	75.7

Table 2

3.5 Mr Jones' results are based on the indicative arrow arrangement which has been demonstrated to introduce a significant and unacceptable safety risk. The results are also based on the 70/30 split of traffic and the premise that lane usage will change from cycle to cycle. This has been disproved previously with on street measurements which recorded queue variations each cycle. The 72.8%/27.2% traffic distribution is a recorded average which reflects the cycle to cycle variation.

As detailed in my Proof of Evidence applying the correct lane distribution (72.8%/27.2%) of traffic on the northbound approach to the signal junction and modelling the fully signalled right turn the predicted delays are as shown in table 3.

AM peak – Average delay per vehicle (seconds)

	75 dwellings	115 dwellings	190 dwellings
	72.8/27.2	72.8/27.2	72.8/27.2
Newgate Lane East northbound	64.3	66.0	68.5
Newgate Lane East southbound	6.2	6.5	7.2
Old Newgate Lane	68.0	72.6	85.7

Table 3

There is currently no delay imposed on Newgate Lane vehicles travelling north/south through the junction. The above results indicate the additional delay that would be incurred by all vehicles travelling along Newgate Lane during the AM peak period with the introduction of traffic signals.

3.6 As previously stated in 3.2 the average delay at both the Toucan and signal junction are exclusive of each other. To derive the cumulative delay on Newgate Lane the delays at each should be combined. Taking the average delay at the Toucan and the Appellant's incorrectly calculated average delay at the signal junction the cumulative delay experienced on Newgate Lane is set out in table 4 below.

AM peak – Cumulative average delay per vehicle (seconds)

	75 dwellings	115 dwellings	190 dwellings
Newgate Lane East northbound	30.1	30.2	30.8
Newgate Lane East southbound	9.5	10.1	10.8

Table 4

It should be noted that table 4 underestimates the cumulative delay as the results calculated by the Appellant for the traffic signal junction use the indicative arrow arrangement that as stated in Section 3.5 I believe is an unacceptable safety risk. The cumulative average delay to Newgate Lane represents a severe impact in terms of delay.

3.7 As already stated the model for the Newgate Lane/Old Newgate Lane junction should include a fully signalled right turn movement and the correct traffic distribution on the northbound approach. Using the corrected modelling for the signal junction the cumulative average delay experienced on Newgate Lane are contained in table 5.

AM peak – Cumulative average delay per vehicle (seconds)

	75 dwellings	115 dwellings	190 dwellings
Newgate Lane East northbound	82.6	84.4	87.3
Newgate Lane East southbound	9.7	10.1	10.8

Table 5

3.8 The results shown in table 5 indicate that the introduction of traffic signals and a Toucan crossing on Newgate Lane would have a significant and severe material impact on vehicle delay at levels far above those indicated by the Appellant.

4 Right turn at signal junction

4.1 In Mr Jones' Updated Proof of Evidence (Section 4.10) he confirms the Appellant's continued use of the indicative arrow to allow drivers to turn right across two lanes of ahead traffic. As stated previously in my Proof of Evidence this is not considered to be safe arrangement based on the proposed junction layout. Comprehensive evidence obtained from signal junctions which had the same arrangement demonstrated an inherent safety risk which resulted in an unacceptable level of safety. Remedial measures were necessary with the full signalisation of the right turn to address the poor safety record. It is underlined that the Appellant's proposed signalling arrangement would be unsafe and be highly likely to result in personal injury collisions.

5 Speed measurement data

5.1 Section 4.12 refers to 'DMRB 'CA185 - Vehicle Speed Measurement Revision 0'. It should be recognised that this document is applicable to All Purpose Trunk Roads.

> *"1.1 This document shall be used for the measurement of vehicle speeds and for determining 85th percentile speeds on existing all-purpose trunk roads."*

Newgate Lane does not form part of the All Purpose Trunk Road network and as such DMRB CA185 does not state that it is applicable at this location.

5.2 Section 4.14 of Mr Jones' Updated Proof of Evidence refers to CA185 paragraph 2.8.2

> *"Speed measurements should be undertaken outside of peak traffic flow periods NOTE 1 Non-peak periods are typically between 10am and noon and 2pm and 4pm. In some cases these times need to be varied to take account of site-specific circumstance e.g. if a school is nearby that closes at 3pm."*

The above guidance indicates typical non-peak periods. It does not preclude measurements being taken at other appropriate periods outside of the suggested 10am to noon and 2pm to 4pm periods. Historically these time periods were suggested when data was collected manually during working hours and avoided the morning, lunch time and evening peaks. The widespread use of automatic equipment allows for the continuous collection of data. It is no longer necessary to limit data to these narrow time bands.

5.3 Document CA185 paragraph 2.5 states that

> *"All speed measurements (spot and journey speed) shall be undertaken in free flow conditions where vehicles are unlikely to be accelerating or braking"*

It is clear that free flow traffic conditions are not exclusively limited from 10am to noon and from 2pm to 4pm. Indeed outside of the peak traffic periods traffic is considered to have been under free flowing conditions. The operation of the traffic signals and the occurrence of vehicles turning right into Old Newgate Lane would not be limited to just the 10am to noon and 2pm to 4pm periods. It is clear that the use of speed data outside of these periods is equally relevant.

5.4 Document CA185 also states that

> *"2.6 A minimum of 200 vehicles speeds shall be recorded during each individual speed measurement period."*

Where the above two statements are satisfied the speed data relating to these other non peak periods is considered to be equally applicable and relevant.

5.5 The speed data where the Newgate Lane northbound 85th percentile speed exceeds 45mph is contained in table 2 below. This data was collected from 7th to 10th November 2020.

Time period	85th percentile vehicle speed (unadjusted speeds)	Average number of vehicles surveyed
Midnight to 1am	51.0mph	17
1am to 2am	50.1mph	15
2am to 3am	51.7mph	16
3am to 4am	53.8mph	14
4am to 5am	51.8mph	53
5am to 6am	**49.1mph**	**227**
7pm to 8pm	**46.6mph**	**265**
8pm to 9pm	48.2mph	185
9pm to 10pm	48.7mph	122
10pm to 11pm	49.0mph	70
11pm to midnight	49.4mph	28

Table 2

5.6 The above speed date indicates that the 85th percentile speed exceeded 45mph during two separate non-peak hours throughout the day. It is concluded that with the 85th percentile speed exceeding 45mph that the right turn movement should be fully signalled. The Appellant's proposal for an indicative arrow to turn right is contrary to design guidance. It is also contrary to the recommendation of the Stage 1 Road Safety Audit. This is reached independently of the safety evidence relating to the right turning movements at other signal junctions.

5.7 Mr Jones states in 4.19 that there would be 1 to 2 vehicles turning right each cycle during the morning and evening peak periods. It should be highlighted that this figure represents the average number and is not definitive. In reality the number would be variable and for some cycles there will a greater number turning right. It is also mentioned in 4.19 that the intergreen period would be 6 seconds. As I previously demonstrated in my rebuttal (section 6.4) the intergreen period in which to turn would be 5 seconds. This would be insufficient for 2 or more vehicles to turn.

6 Conclusions

6.1 The use of Linsig software to model delay at the Toucan crossing is in accordance with industry standard practice.

6.2 The use of excessively high and unrealistic saturation flows in the VISSIM model lead to the conclusion that the Appellant's predicted delays at the Toucan are incorrect and cannot be relied on. The vehicle delay results presented in this rebuttal using Linsig software with accurate saturation flows are correct and show the true scale of delay that the Appellant's scheme would cause to Newgate Lane. This level of average delay would result in a material and severe impact to Newgate Lane.

6.3 The operation of the traffic signal junction and Toucan crossing would not be co-ordinated. It is appropriate to consider the delays at the signal junction and the Toucan crossing separately. The average vehicle delay associated with each should be taken cumulatively to form the overall additional delay.

6.4 The Appellant has significantly underestimated the average delay for Newgate Lane northbound vehicles at the proposed traffic signal junction with Old Newgate Lane. When taken cumulatively there is a significant and severe impact on delays on Newgate Lane northbound.

6.5 The latest vehicle speed data indicates that the 85th percentile speeds exceeded 45mph for 2 separate non-peak hours during the day. This demonstrates that the right turn movement at the signal junction must be fully signalled to meet national design guidance and to satisfy the recommendation of the Road Safety Audit. This concludes that the Appellant's model for the Newgate Lane/Old Newgate Lane signal junction using an indicative arrow to turn right is both unsafe and does not meet guidance. Consequently their modelling results for the signal junction are incorrect and underestimate the average delays that would occur.