Appendix A: PS 059 Tunbridge Wells Local Plan Stage 3 Part 2 Outcomes – Local Capacity Sensitivity Testing Technical Note – Sweco 28.11.23 – commentary provided by the Local Highway Authority on 14 December 2023.

Introduction

The document summarises modelling results and potential mitigation schemes arising from a Local Plan High Modal Shift (LPMS) scenario. It would be useful to include in this Technical Note the modal shift assumptions that have been included in the modelling for avoidance of doubt. Please confirm it is as shown below:

> The following table summarises the anticipated modal shift from car use as a result of the combined impacts from the measures set out in this Note, which are expected to result in appreciably higher modal shares for cycle and bus use:

Locality	Area-wide measures	Local measures – base	Local measures – potential	**Combined shift**
Paddock Wood	-5%	-10%	-15%	**-15-20%**
Royal Tunbridge Wells	-5%	-5%		**-10%**
Pembury	-5%			**-5%**

> [NB The reductions from "local measures" are to be applied only to the traffic generated from Local Plan allocations, while the reductions from "area measures" are seen as applying to all local trips.]

Clarification is needed of the infrastructure/measures/services included in the LPMS scenario and the funding source. This could be listed in the Appendices. Reference is made to council investment in public transport services and active travel infrastructure. It would be helpful to outline what investments are expected to be funded by KCC H&T and TWBC.

The LPMS scenario assumes high modal shift which is the best case scenario. Whilst one would not argue with this vision for the Local Plan transport strategy, it will require a 'Monitor and Manage' framework and this is not discussed in the Technical Note.

A monitor and manage strategy is essential for the success of the Local Plan transport strategy and will provide evidence that the sustainable transport interventions are achieving the modal shift as modelled in this TN. Additional scenario testing is required of the reasonable worst case scenario to identify network hotspots and the mitigation needed if high modal shift is not achieved. This mitigation should be included in the Infrastructure Delivery Plan but brought forward only if the monitoring strategy identifies that the high modal shift has not been achieved.

The scope of this TN is restricted to seven key junctions. There are other junctions identified as hotspots in the Local Plan Stage 2 report which have not been included. Further evidence and explanation that other areas of the network are not significantly impacted by the Local Plan development strategy is needed.

Junctions and links where there are existing safety concerns and which are predicted to experience an increase in traffic flows following Local Plan development should be included in this TN and assessments completed.

Mitigation Design and Costs

Costs exclude statutory undertakers' apparatus and detailed design. The TN states that these are to be addressed at planning application stage. What contingences are included in the costs to allow for these? Costs which are not included in the IDP will result in either risk to the highway authority or impact viability.

Strategic Model Scenarios

The **Local Plan Modal Shift (LPMS**) scenario includes future council investments. Please provide detail in the Appendices of the sustainable transport mitigation which is included in this scenario and the funding source.

The **Local Plan Highways (LPH)** scenario includes the final list of the potential highway mitigation measures identified for the local plan in terms of addressing network changes. Additional network mitigations may be required if the monitor and manage strategy shows that the high modal shift has not been successful. This is why an additional scenario is needed to show the highway mitigation needed if high modal shift is not achieved. The monitor and manage strategy may evidence that these additional mitigations may not be needed but it is important that the cost of the schemes are included in the IDP and viability assessment.

Reference is made to work undertaken between TWBC and KCC to ensure measures to increase modal shift will happen through the wider LCWIP and BSIP processes. Whilst developers and successful bids could help deliver the LCWiP there is no BSIP funding for measures in the Tunbridge Wells district. Please provide details of how this will impact the IDP and modal shift?

Model Years and Mitigation Implementation Year

The TN provides an overview of the 2038 modelling results comparing the 2038 Reference Case (RC) scenario with the LPMS (high modal shift) scenario for the same year, however additional scenarios are needed not only for a 2038 reasonable worst case but also early to mid plan period, to evidence when the mitigation is needed to be delivered.

Review of Key Strategic Model Outputs

The TN provides a 'high-level summary of the junction flows at the key junction locations identified in Section 1.' Additional junctions should be included where hotspots are identified in the scenarios presented but also in an additional Local Plan reasonable worst case scenario in order that mitigations can be developed if the monitor and manage strategy finds that there has not been a high modal shift.

Link Capacity Review

A228

Page 7 states that the trigger for the Colts Hill Bypass and expanded Badsell Road roundabout is at 2000 homes – can evidence be provided of this and has this been estimated using the Saturn model?

The **B2017 Five Oak Green** link capacity is shown to be at full capacity in the LPMS scenario with a v/c value of 100 in the AM peak compared to a v/c value of 68 in the RC. Clearly the local plan development strategy has a significant impact even with the high model shift. This is a cause for concern because capacity issues along the B2017 will impact bus journey times and impact the modal shift. Capacity improvement schemes for the B2017 should be brought forward and included in the design for the Colts Hill Bypass and the Badsell Roundabout improvement scheme.

Overview of the Junction Modelling Undertaken

Modelling of the roundabouts in the TN makes use of Junctions 9 however Junctions 10 is the latest software to model junction capacity including roundabouts.

Junction 8 A26 Woodgate Way/B2017 Tudeley Road/Tudeley Lane

Figures 4-1 and 4-3 Arcady Results are labelled wrongly, Five Oak Green Road should be Tudeley Lane.

The mitigation of the junctions refers to a widening of the westbound lane (north side) Please check if this is supposed to be eastbound.

Opportunities to enhance pedestrian and cycling provision could be included in the design.

Table 4-1 indicates that during the AM peak the B2017 Tudeley Road is over capacity in the RC and becomes significantly worse in the LPMS scenario with additional delays of 118s, additional queuing of 48 pcu's and congestion. Mitigation is proposed in the form of additional lane capacity on the B2017 Tudeley Road. The Arcady results in Table 4-3 indicate that the proposed mitigation would relieve the queues and delays and the junction would operate within desirable capacity in the 2038 LPMS scenario.

The estimated year of implementation is 2031, can evidence be provided to support this?

The high level cost is £500,000 what contingencies are included?

Junction 12 A228 Branbridges Road/B2160 Maidstone Road/A228 Whetsted Road (Hop Farm Roundabout)

Results from the Saturn modelling shown on Table 6 indicate that mitigation is needed. The Arcady assessment in Figure 5-1 indicates the junction to be over capacity in the 2038 RC and this is worsened in the LPMS. Proposed mitigation involves the extension to flare

lengths on two approaches, however the A228 (N) Branbridges Road remains over capacity with a LOS of E. Further measures should be considered to improve this.

The improvements are required by 2031 and evidence is needed to support this.

Junction 13 A228 Maidstone Road/Badsell Road

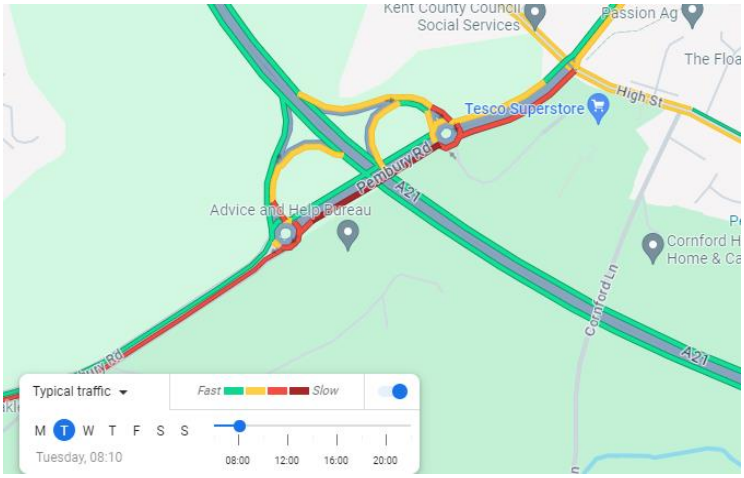
Table 7 shows that the junction is over capacity in the 2038 RC and this becomes significantly worse in the LPMS scenario. Stantec have produced designs to improve the junction and allow links to the Colts Hill bypass.

The modelling indicates that the mitigation delivers improvements when compared to the RC but there are still delays. Stantec are refining the design and it is important that any scheme delivered operates within desirable capacity given the costs and scale of disruption to motorists during the construction of the scheme. Once the outline design is finalised details of the costs, the proposed roundabout geometry, tracking diagrams, deflection, safety audit and Arcady outputs will be required.

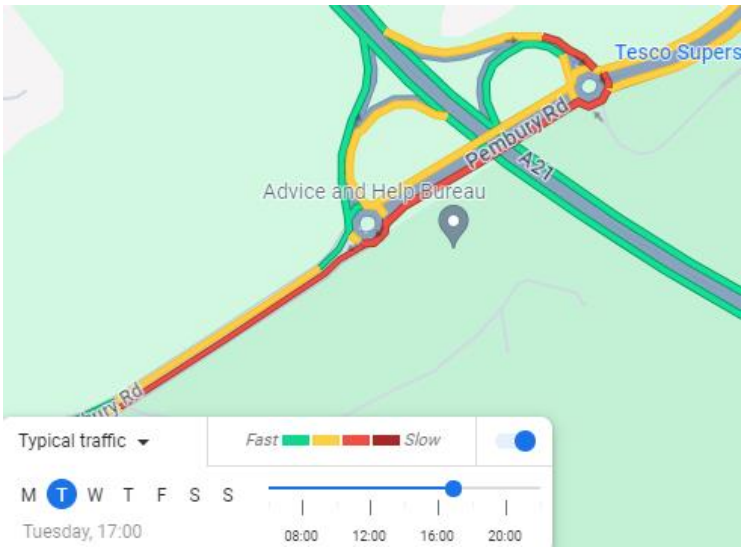
Junctions 21 and 22 A21/A228/Tesco (Dumbbell Roundabouts)
Summary of Modelling Results and Reason for Mitigation

Table 9 indicates that the strategic model finds the junctions to operate within capacity in both the peak periods in the 2018 Base Case (BC). In the RC the model indicates capacity issues only on the A21 slips and Tesco access. This is not evident on the ground. Both junctions currently suffer from capacity issues in both peak periods and this can be seen from the Google extracts below:

AM Peak



PM Peak



The validation of the 2018 base case is therefore questioned with regard to these junctions.

Table 9 Strategic Highway Modelling outputs

The additional queues and delay identified on Table 9 in the LPMS scenario for both the AM and PM peaks are considered to be significant. In particular the increase to queues and delays on the A264 (SW) approach to the southwestern dumbbell in the AM peak where an average queue length of 26 pcu's and 66 second delay is predicted in the LPMS scenario compared to a queue length of 1 and 21s delay in the RC. Also significant is the A21 south bound slip (N) which is expected to see a 17 vehicle queue and 143 second delay. The impact from the access from Tesco is particularly severe as a 54 vehicle queue and 943 second delay is predicted in the LPMS scenario.

Figure 7-1 Arcady Results:A21/A228 South West Dumbbell

An Arcady assessment of the A21/A228 south dumbbell roundabout supports the requirement for mitigation with additional queue lengths and delays along the A228 and A264 in the AM peak and significant additional queue and delay on the A264 during the PM peak in the LPMS. It can be seen that the Local Plan development strategy even with the high model shift scenario severely worsens capacity queues and delays at this junction.

Mitigation solutions should be tabled for both the dumbbell roundabouts to improve capacity.

Clarification is needed as to what if any infrastructure has been included in the modelling as previously Sweco proposed a bus lane between the dumbbell roundabouts.

Junction 35 Kippings Cross Roundabout A21/B2160

The strategic model indicates there are capacity issues on the A21 (E) and B2160 during the AM peak in the 2038 RC which becomes significantly worse in the LPMS scenario. This is backed up by the Arcady assessment which identifies congestion on the same arms during the same peaks as the strategic model.

The impact of queuing back and blocking from the Blue Boys roundabout is not assessed in this TN. This is an important factor as queuing back from the Blue Boys roundabout occurs in the peak hours and this impacts significantly on the Kippings Cross junction. It is recommended that this is included in the modelling for Kippings Cross.

Option Development

A number of options to mitigate the local plan development strategy at Kippings Cross have been explored and two options put forward for further design and modelling. KCC H&T recommend that alternative options are explored which take less land. Capacity assessments should take into account the impact of the congestion from the Blue Boys roundabout. Both schemes, which are labelled KX10 and KX11, seem to be problematic with high risk to delivery and little detail is provided to inform results.

KX10 Left turn slip lane

This option provides a left turn slip lane between A21 west and the B2160. Such significant changes require a safety audit, technical review and capacity assessment. The proposal requires third party land and therefore CPO would most likely be required. A listed building may also be impacted. The design includes a give way on the B2160 to allow priority from the slip road from the A21 west. The safety of this arrangement is a concern and potential for queuing back onto the roundabout. The capacity issue at this junction affects mainly the A21 westbound which will see little benefit from this option.

The modelling results show that the A21 east and Dundale Road remain over capacity with the delivery of the scheme. The LOS for the A21 east remains at F and Dundale Road is also F during the AM peak, although there is some improvement to B2160 and to the junction overall in the PM peak. At an estimated high level cost of £500,000 plus land

acquisition, utility diversions and extensive disruption and delays to existing traffic during construction it is considered that a scheme which delivers better performance is needed.

Figure 8-5 – KX10 ARCADY Analysis Results

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Local Plan Modal Shift (LPMS) 2038							
1 - B2160	4.3	17.48	0.8	C	1.2	8.96	0.52	A
2 - A21 east	28.5	77.18	1.01	F	2	6.82	0.64	A
3 - Dundale Road	0.8	108.77	0.47	F	0.3	9.54	0.19	A
4 - A21 west	1.5	4.52	0.58	A	3.2	7.68	0.75	A

KX11Modified roundabout

This scheme proposes significant alterations to the roundabout and full signalisation. The scheme is not deliverable within the existing highway boundary and so CPO is required. A layout showing the traffic signal arrangements is needed for review by KCC Traffic Signals team.

The junction mitigation option is assessed in isolation of upstream capacity issues on the A21 east of the Kippings Cross junction. As the upstream capacity issues and queuing have a major impact on this junction it is considered that the assessment should take the upstream capacity issues into account.

The Linsig assessment of the junction is shown in Table 8.2. The proposed signalised roundabout scheme would be over desirable capacity in 2038 in both peak hours in both the reference case and in the LPMS scenarios. The full Linsig results should be provided showing the reserve capacity at the junction.

Conclusion

Additional information is needed as outlined in detail above in order to demonstrate that the revised local plan development strategy can be safely accommodated on the highway network without severe impact. A monitor and manage framework is needed, to be agreed with KCC H&T, to support the vision for high modal shift and to validate the success of the proposed sustainable transport interventions. Further modelling is needed to demonstrate the impact of the local plan development strategy in a reasonable worst case scenario and to identify if additional mitigations are needed if the high modal shift is not achieved. Evidence is also needed to demonstrate when the mitigations are required.