

TW Stage 1 Technical Note

Review of Strategic Model Methodology and Set Up for Local Plan

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Change list

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2	July 2023	Updated with final methodology	DH	LP
3	July 2023	Updated to reflect TWBC comments	DH	LP
4	August 2023	Updated to reflect further TWBC comments	BH	LP
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1 Introduction

Sweco has been commissioned by Tunbridge Wells Borough Council (TWBC) to undertake a further transport modelling for the TWBC Local Plan submission to assist in addressing Inspector's comments at the Examination in Public (EiP) for the TWBC Local Plan. This work will focus on a revision to the proposed development allocations, most notably the removal of the Tudeley development strategic site and a reduced growth at Paddock Wood, and the impacts of this on the need for additional transport infrastructure in the area.

The review of the Local Plan modelling work will be split into three Stages. Stage 1 involves a review of the modelling methodology and key assumptions to establish whether any changes need to be made to account for latest updates in guidance or changes in travel patterns/demands. This Technical Note (TN) therefore details the work undertaken in Stage 1 "Model Review", the key tasks of which are set out below:

- Review of robustness of the Baseline 2018 model in the wake of the Covid-19 pandemic and how flows within the model relate to observed data in 2022 (post-pandemic).
- Assessment of latest National Trip End Model (NTEM) model forecasts to compare impacts of using TEMPro 7.2 housing and growth factors against the recently released TEMPro 8 version.
- Review of Reference Case development and model network against the previous iteration based on the updated data released to ensure the model best represents future conditions.
- Review of proposed development within Paddock Wood to confirm accuracy in key areas around development assumptions.

The primary outcome and objective of this stage is to get sign off from TWBC and key stakeholders Kent County Council (KCC) and National Highways (NH) on any modelling changes considered appropriate to revise the model since the last modelling undertaken in 2021, and therefore acceptance of the modelling methodology and demand adopted to assess the revised Local Plan development growth scenario.

Stage 2 will involve modelling the Local Plan development growth scenario, without mitigation in terms of transport interventions. As instructed by TWBC, the following two Local Plan scenarios will be tested. Further details of these are provided within Chapter 7.

1. 10 years' supply of housing post-adoption – Full site allocation provided by 2034.
2. 15 years' supply of housing post-adoption – Additional growth post 2034 to 2038.

This stage will outline the level of hotspot issues on the network as a result of the revised Local Plan development growth scenarios modelling runs. Potential transport mitigations to offset identified capacity issues will then be identified for each scenario in order to establish what infrastructure would be required to support the level of growth identified.

Stage 3 will focus on testing and understanding the effectiveness of the mitigation measures identified in Stage 2. In line with guidance in the Department for Transport (DfT) Circular 01/2022 'Strategic road network and the delivery of sustainable development', the mitigation measures will first look at active mode and public transport interventions. The potential mitigation will firstly be tested within the strategic model. In the event that the strategic modelling identifies areas where outstanding capacity or network operation issues are still occurring, then more detailed analysis will be undertaken. It is anticipated that this will involve local junction modelling to confirm operational capacity of specific highway schemes. The output of this stage will be a final list of transport mitigation schemes required to offset the impact of Local Plan development in Tunbridge Wells borough, including when these mitigation measures would be required within the Local Plan period.

2 South East Regional Transport Model

2.1 Background

The Tunbridge Wells model was developed from the South East Regional Transport Model (SERTM) 2015 base year model, a strategic transport model developed by NH as part of a package of models to assess RIS schemes within England. Each of these models is a full model of the UK, with detailed modelled areas covering the respective region of the UK, and buffer network covering larger inter-regional travel.

The Tunbridge Wells model was developed from a cordon of the SERTM, using the network and demand from this developed model. As the Tunbridge Wells model was developed in 2019, it uses SERTM 2015 as the source model. NH has since re-based SERTM to a 2019 base year, undertaking new data collection exercises. As a result, NH has issued the following query around using potentially out-dated traffic data from the SERTM 2015 model, as opposed to using more recent SERTM 2019 data.

'We are aware that the traffic model you have used to date has been built using SERTM prior matrices from 2015 mobile network data. This underlying data is now 8 years old. TAG Unit M2.2 Paragraph 4.4.4 gives advice on the use of older data. If there is significant further modelling to be undertaken to address the Inspector's comments, we will require justification for the continuing use of a model built using 2015 observed movements. This is particularly so as more recent SERTM 2019 prior matrices are available to assist local authorities in building models. This information could be used to update the model or to examine whether changes to the matrices over the four year period have resulted in any material changes.'

Sweco address the comments and queries from the above in the following sections.

2.2 TAG Unit M2.2

'This underlying data is now 8 years old. TAG Unit M2.2 Paragraph 4.4.4 gives advice on the use of older data.'

TAG Unit 2.2 states the following on use of older data for modelling. Text in bold will be further analysed.

*'Practitioners should establish evidence on scale of changes to land use and demographic characteristics, transport networks, and travel patterns, with more attention given to the key movements in the model internal area and use this evidence to assess the validity of 'old' data sources and their suitability for the intended use(s) of the model to judge their suitability for those use(s). **Former guidance** (withdrawn sections of the Design Manual for Roads and Bridges) **indicated that models should not be used without justification where the source data is more than five years old** when used for detailed scheme appraisal because there might be significant changes to the travel patterns and traffic level. **This simple threshold should not be used**, as there can be significant changes that would make the use of more recent data inappropriate or **there may have been little change and older data may be acceptable**. Changes such as **the closure or opening of a major retail centre or major transport infrastructure such as a new bypass** would be expected to **result in the need to collect and use more recent data**.'*

Previous guidance about the longevity of validated transport models has now been retracted. There is only one major scheme to have been implemented in the study area between 2015 and 2019: The A21 upgrade scheme. This scheme was opened in 2017, which is prior to the development of the Tunbridge Wells model and hence has been captured during the traffic count collection and model calibration and validation.

2.3 TAG Proportionate Update Process

The TAG Proportionate Update Process (PUP) provides guidance on when models should be updated in light of new evidence. Clearly, a full model re-basing every year is not a proportionate response, and this is evidenced by the guidance published by the Department for Transport.

We note the following points from the PUP:

- *'(There is no need to update the model where) adopting the change would require significant increase in the resources, cost, and/or time needed to prepare the decision advice'.*

Fully re-basing the model in order to react to changes in demand and zoning between SERTM 2015 and 2019 would require a significant undertaking in both time, cost and resourcing. Additionally, all model runs considered as part of this Local Plan Modelling commission would need to be re-produced: Previous Reference Case, Previous Local Plan including Tudeley Village, TEMPPro 7.2 Reference Case, TEMPPro 7.2 Updated Local Plan and TEMPPro 8 Sensitivity Tests. This very large undertaking is not considered proportionate to giving an understanding of the potential impacts of the proposed Local Plan allocations at this stage.

- *'The Department expects that such decisions should be made on a scheme by scheme basis and be based on balancing the need to ensure decisions are based on up-to-date evidence with the need to support decision makers in delivering their programme'.*

The above guidance suggests that decisions can be made based on the requirements of decision makers (KCC, TWBC, Local Plan Inspector) to meet programmes whilst ensuring models are fit for purpose regarding the composite data. As such, in order to meet the programme for submission required by TWBC, Sweco consider that there is insufficient evidence or guidance suggesting that an update to these matrices is required. Therefore, the 2018 base year Tunbridge Wells model is suitably calibrated, validated and checked against current traffic levels to provide a robust understanding of traffic flows in the future.

2.4 Additional Information about the Tunbridge Wells Model

'This is particularly so as more recent SERTM 2019 prior matrices are available to assist local authorities in building models. This information could be used to update the model or to examine whether changes to the matrices over the four year period have resulted in any material changes.'

Sweco understands and acknowledges the value in using the most up to date SERTM data in demand modelling, however updates to the Base model are beyond the scope of the current project. It is also considered important to ensure consistency between modelling runs, so that the impacts of the revised Local plan growth scenarios can be easily identified.

In the model development process, the SERTM matrices were used to identify demand between SERTM zones. However, this zoning system is significantly coarser than that used in the Tunbridge Wells model. As such, during the initial base year matrix development process, a TAG-compliant process was used to infill these shorter distance trips and calibrated and validated against new traffic counts within Tunbridge Wells. The demand from SERTM, therefore, is not a significant cause of demand between internal model trips and will not cause a major change between SERTM versions. Sweco have also checked model flows at a key junction in the area against WebTRIS permanent ATCs, showing good correlation between the two and suggesting that traffic flows and patterns have not changed significantly since model development, even accounting for the impacts of the Covid-19 pandemic. This analysis can be found in the Section 3 of this report.

2.5 Summary

Conclusion: SERTM Review

In response to the comments made by NH, Sweco acknowledge that newer SERTM 2019 matrices are available, which would provide a more up-to-date understanding of the calibrated and validated SERTM model movements within the South-East of England.

However, with our understanding of this model and commission, it is not considered proportionate to the scale of the project to update the Tunbridge Wells Model with SERTM 2019 matrices, as backed up by TAG Unit 2.2 and the Proportionate Update Process discussed within this Chapter. In addition, the Tunbridge Wells base model utilised a TAG-compliant process to infill shorter distance trips with the model validating well against observed traffic count data.

Therefore, Sweco do not propose an update of the SERTM-based, base year matrices which underpin the Reference Case and Local Plan models.

3 Baseline Traffic Levels Review

3.1 Local Area Traffic Levels Analysis

Based on comments from Tunbridge Wells Borough Council (TWBC) and Kent County Council (KCC) about reviewing the post Covid traffic levels, the following was agreed upon for Sweco to review to establish if a refinement in baseline demand is required:

“Local Modelling Analysis - review of the KCC pre and post-Covid traffic analysis to understand robustness of baseline and traffic growth”

The following text has been adapted from the “Kent Traffic Survey Analysis Technical Note”, prepared by Jacobs for Kent County Council in January 2023. The technical note is intended to analyse changes in travel patterns and behaviours may have occurred between 2019 and 2023, following the Covid-19 pandemic. Sweco have used this document, along with evidence from a WebTRIS count site near Kippings Cross, to establish whether Sweco’s 2018 base year model of Tunbridge Wells remains suitable as the basis upon which to base the revised Reference Case and Local Plan modelling.

The analysis of the KCC report is set out in **Figure 1** and the following paragraphs below, whilst the results of the permanent traffic count site review are discussed in Section 3.2.

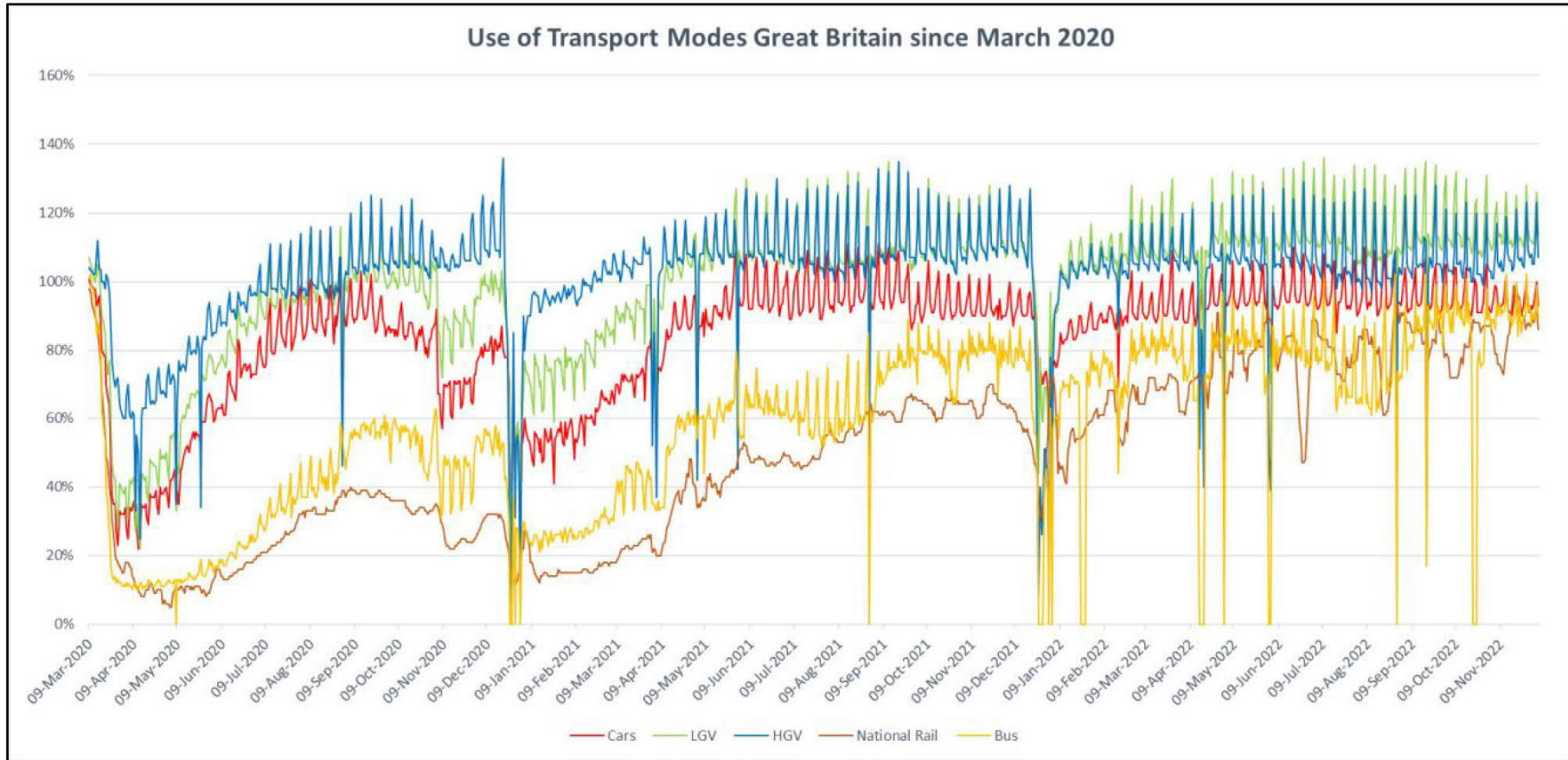
In **Figure 1**, it can be seen that levels of highway demand are constant throughout the year without major seasonal increase or decline. It also suggests that any changes to travel patterns seen in the years between 2019 and 2022 are temporary effects driven by external factors, such as lockdowns and travel restrictions. There is no evidence of fundamental changes to travel behaviours. The KCC report further explains that any long-term effects arising from the pandemic can be captured using inputs to the demand within an established and suitably calibrated/validated model.

Whilst there has been some limited growth in transport use between 2019 and 2022, this can be attributed to a growth in LGV demand as traffic flows show that travel by cars and HGVs has not fully recovered to pre-pandemic levels. It is not possible to determine whether these are simply due to a longer-term return to pre-Covid-19 travel patterns, or a result of permanently altered travel patterns. Traffic flows are considered close to 2019 (pre-pandemic) levels in around 90% of cases in the Kent Traffic Survey Analysis, aligning with targets set out by the DfT.

Summary

The evidence provided in the technical note suggests that there have been no significant or fundamental changes to travel patterns and traffic flows in the period since the 2018 base year model was prepared. It is therefore considered that the methodology and background assumptions to Sweco’s 2018 base model remain sound, and provided that any forecasting models are updated with suitable travel demand data, still suitable for use in this updated modelling work.

Figure 1 Use of Transport Modes Great Britain since March 2020 – DfT Data, taken from Kent Traffic Survey Analysis Technical Note, Jacobs, Jan 2023¹



¹ Source: Jacobs analysis of DfT data from <https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic>, retrieved January 2023

3.2 Permanent Traffic Count Review

A review of traffic flows along the A21 was undertaken, using historic traffic counts taken from WebTRIS for a neutral month between 2018 and 2023. This review only looks at one count site, as it was undertaken as part of a review of the Kippings Cross roundabout. From the traffic data set out within **Table 1**, the effects of the Coronavirus pandemic can clearly be seen, with a greater than 50% drop in flows between 2019 and 2020. However, these flows then gradually return to similar levels seen in 2018, with traffic in some cases overtaking the pre-pandemic flows.

Table 1 Traffic Flows Along the A21 Compared Using WebTRIS for a Neutral Month Between 2018 and 2023

WebTRIS Site	Year	AM Flow	PM Flow	AM Change from Previous Year	PM Change from Previous Year
Site 5867/1 on A21 southbound between B2160 and A262	2018	756	1,334	-	-
	2019	811	1,231	7%	-8%
	2020	345	417	-57%	-66%
	2021	819	1,198	137%	188%
	2022	No Available Data	No Available Data	-	-
	2023	832	1,180	2%	-2%
Site 5867/2 on A21 northbound between A262 and B2160	2018	1,067	964	-	-
	2019	1,054	1,011	-1%	5%
	2020	431	311	-59%	-69%
	2021	976	1,030	126%	231%
	2022	No Available Data	No Available Data	-	-
	2023	1,039	922	6%	-11%

The overall change in flows between 2019 and 2023 is set out in **Table 2**. From Table 2 it can be seen that the flows recorded at this location in 2023 are very close to those recorded in 2019. This pattern is consistent with that identified within the Kent Traffic Survey Analysis technical note of no significant changes in travel patterns or traffic flows.

Table 2 WebTRIS Percentage Change 2018 – 2023 on A21

WebTRIS Site	Year	AM % Flow Change	PM % Flow Change
Site 5867/1 on A21 southbound between B2160 and A262	2019-2023	3%	-4%
Site 5867/2 on A21 northbound between A262 and B2160	2019-2023	-1%	-9%

3.3 Summary

Conclusion: Traffic Levels Review

Whilst it has been shown that traffic flows are slightly reduced in the Kent area and within Tunbridge Wells as a result of the Covid-19 pandemic, there is strong evidence that these flows are returning to their pre-pandemic levels. As such, it is considered that the travel patterns and behaviours used in the development of pre-pandemic models remain valid, with little evidence to suggest that there is a long-term shift in these patterns resulting from the pandemic.

Therefore, the previously calibrated and validated Tunbridge Wells 2018 base year model remains a good basis upon which to assess the revised Reference Case and Local Plan modelling and would not need to be updated for this piece of work.

4 Growth Factors for Surrounding Area

The use of National Trip End Model (NTEM) to fill in the background demand for the surrounding boroughs is an established process for Local Plans and this process has been previously agreed with NH and KCC for the Tunbridge Wells Local Plan. It should be noted that NTEM is used within the modelling purely to calculate the future highway demand and not for the calculation of housing need.

This section looks at the need to revisit growth factors for the surrounding areas as a result of a new release of NTEM in February 2023, under NTEM Version 8. Tunbridge Wells Local Plan modelling to date has been under NTEM Version 7.2.

The ultimate objective of this work is to respond to what was set out by the Inspector in his letter November 2022, specifically:

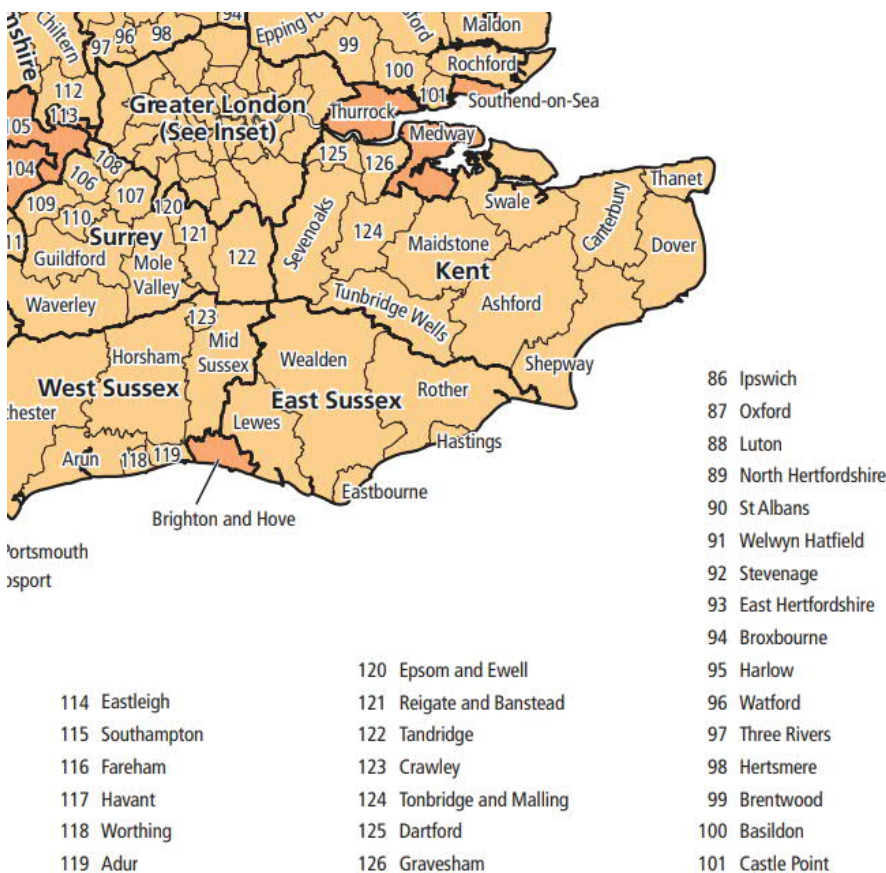
'Modify the submitted Plan by making significant changes to the Tudeley Village allocation, and in doing so, seek to overcome the soundness issues identified above.'

The focus of this work as a result is therefore to make representative changes to the modelling that reflect any wider updates since the work examined by the Inspector was undertaken, whilst allowing for the core comparison between modelling with and without Tudeley to take place.

In terms of local growth, the methodology is to use direct TWBC development assumptions for Tunbridge Wells borough and therefore, the modelling will be revised to reflect the change in development growth, including the removal of Tudeley Village and reduced growth in Paddock Wood.

Figure 2 (ONS Geography GIS & Mapping Unit) identifies the surrounding local boroughs of Tunbridge Wells where NTEM has been adopted to establish the background demand from neighbouring authorities.

Figure 2 Surrounding Boroughs around Tunbridge Wells Borough



The key boroughs which border Tunbridge Wells Borough, and therefore have been included in the Sweco model to date, are:

- Sevenoaks (Kent)
- Tonbridge and Malling (Kent)
- Maidstone (Kent)
- Ashford (Kent)
- Rother (East Sussex)
- Wealden (East Sussex)

4.1 Differences Between NTEM Versions 7.2 and 8

To date NTEM Version 7.2 has been used for the Tunbridge Wells Local Plan assessment. However, since the Examination in Public a new version of NTEM has been released as Version 8.

The changes between NTEM Version 7.2 and Version 8 are summarised below:

- Forecasting horizon was extended to 2061 from the previous 2051
- Population projections at local authority district level have been changed by using the 2018-based forecasts, 0% future EU migration variant. NTEM 7.2 is based on 2014-based projections.
- Household information for 2021 to 2061 was derived using the 2018-based Principal scenario to fill the gaps in the 0% future EU migration scenario.
- Dwellings projections were updated – For England - local plans to meet housing requirements set by the National Planning Policy Framework and live tables on housing supply.
- Employment projections - the Working Futures jobs by sector, gender and working status was used to estimate medium term jobs. For long term growth the Office of Business Research (OBR) forecasts of unemployment (and hence employment) was used.
- Income Index or GDP per household has been changed in the car ownership model
- Car purchase cost index has been changed in the car ownership model but is held constant throughout the forecast period.
- Car running cost index has been changed in the car ownership model. Motoring costs specifically average fuel and non-fuel costs per kilometre were updated using the TAG Databook (version 1.15, July 2021).

Another key change from Version 7.2 is the population projections. The growth from 2021 to 2051 underlying the Version 8 projections is 6.2% compared with 14.6% growth in Version 7.2 over the same period. This means that in 2051, the total population underpinning Version 8 Core scenario is 7.4% lower than it was in Version 7.2. The population forecasts inform the household projections which are used in NTEM to relate population to the supply of housing (dwellings) and for the household car ownership model.

Overall, the reduction in population growth is reflected in a reduction in the number of households when compared to the projections within Version 7.2. As population growth is lower, the household growth is also lower, with 10% fewer households in 2051.

Within TEMPro, the expected development in dwellings by local authorities are used to (re)distribute the input population projections based on the best estimate of where residential development is likely to occur. For Version 8, projections of housing requirements by local planning authority were provided by the Department for Levelling Up, Housing and Communities (DLUHC). These housing requirements were informed by local housing needs assessment following the approach laid out in the national planning guidance. This information differs from the housing assumption used in earlier versions which used “housing trajectories” from the local authority monitoring reports. While the use of housing requirements is a different measure, the statistics are likely to be more stable through time and the information is collated for the majority of local authorities.

In terms of dwelling inputs, the planning system does not provide housing requirements or estimates more than twenty years into the future, and at any one time the period remaining for the adopted plans can be significantly less. NTEM Version 8 has therefore assumed continued patterns of growth based on the latest available number of dwellings per annum to generate housing forecasts up to 2061.

It is recognised that the Version 8 core planning data may give the impression that there are fewer houses being built within study areas than expected when compared to Local Plan growth forecasts for example. However, this is because the TEMPro outputs report the number of households, i.e., groups of people, not the number of dwellings (houses and flats). The number of households in the TEMPro output is an NTEM model output. It is modelled based on the following model inputs:

- the forecast population, including their age and gender profiles
- the forecast number of dwellings
- the forecast number of households five years before the forecast year (i.e., some of the NTEM output for year n become NTEM inputs for year $n+5$).

The NTEM 8 employment forecast was derived by applying growth factors to the base year data rather than using absolute forecasts directly. The NTEM 8 dataset assumes higher levels of growth than NTEM 7.2 in the short term, but the growth is not sustained in the long term and employment levels are projected to fall slightly from 2043. The result is higher employment in NTEM 8 until 2045, then lower levels of employment than NTEM 7.2.

As outlined above, the NTEM 8 Core scenario includes updates to the planning data projections as well as revised economic and cost parameters based on Office of Budget Responsibility (OBR) forecasts published in March 2021. In summary, the changes to input data for the NTEM 8 Core scenario are as follows:

- Population grows more slowly through time than in NTEM 7.2, levelling off to a total population of 68.9 million people by 2061 in NTEM 8, similar to the level forecast by 2033 in the NTEM 7.2 dataset.
- Population growth between 2021 and 2051 is less than half the growth in NTEM 7.2, at 6.2% in NTEM 8 compared with 14.6% in NTEM 7.2.
- The lower population growth primarily affects the younger age groups. Those aged 75+ years are the only age group in the population with higher growth in NTEM 8 than in NTEM 7.2.
- Households grow more rapidly than the population due to reducing household sizes through time. Household forecasts are around 10% lower than those in NTEM 7.2 in 2051.
- Dwellings assumptions are based on the most up to date local planning information, with input from stakeholders across GB. Inputs reflect variation in anticipated growth by authority.
- Dwellings growth in England for NTEM 8 is based on housing requirements, thereby providing adequate provision in total across the country.
- Employment growth is forecast to be relatively strong in the short term, but employment peaks in 2041 then reduces to 2061.
- GDP per household increases steadily through time, but at a lower rate than assumed previously for the NTEM 7.2 forecasts.
- Motoring costs are expected to fall until 2045 then, due to the uncertainty associated with the longer term, level off until 2061.
- No evidence was found to indicate trip rates have changed from those adopted previously. The NTEM 7.2 parameters have been retained unchanged for the 2021 to 2061 forecasts.

The lower population projections, based on updated ONS projections, will in turn lead to lower travel demand forecasts in NTEM 8 compared with NTEM 7.2. As the population ages and employment levels reduce the mix of travel occurring is also likely to change.

4.2 Stakeholder Comments

NH, in its response dated 15 June 2023, stated:

'The use of TEMPRO 8 will have a range of benefits and risks. For example, while it is more up to date (uses 2018-based population forecasts), technically it could be considered contrary to national guidance.'

'The government's planning practice guidance on housing need assessment expects the baseline housing need for local plans to be informed by the 2014-based household projections (standard method). Although this is under review (see current planning reforms) we do not expect a change of position until 2024 at the earliest when more detailed outputs from the Census 2021 are published.'

'The government maintains the continued use of 2014-based household projections (which were informed by the 2014-based sub-national population projections) because later projections (which are lower) would undermine the delivery of their target of 300,000 housing units per year by the mid-2020s.'

KCC, in comments on an earlier version of this report, stated:

'Good to stick with higher background growth using TEMPRO 7.2 rather than the newer 8.0 as reasonable worst case.'

However also raised the following concern:

'It is robust but if that level of growth is unlikely then there will be unnecessary engineering/mitigation.'

As part of recent discussions between Sweco and TWBC it was agreed to undertake forecast scenarios both using NTEM 7.2 and NTEM 8. This will provide both a worst-case scenario (v7.2) and a scenario using the latest data (v8).

4.3 Core Scenario

A true analysis of the impact of the revised Local Plan growth scenario, including the removal of Tudeley Village and reduced growth in Paddock Wood, relative to the previous modelling, can only be achieved through the continued use of the NTEM 7.2 growth rates. The government also currently maintains the continued use of 2014-based household projections, consistent with NTEM 7.2. The use of NTEM 7.2 can also be considered worst-case in terms of traffic growth. The updated **Core Scenario** will therefore continue to use NTEM 7.2.

There is however also recognition of a need to undertake a comparison scenario based on NTEM 8 to understand the impact of the Local Plan using the latest available dataset. This is seen as the **Sensitivity Test**.

4.4 Summary

Conclusion – Wider Development Growth:

Sweco conclude the updates to the Tunbridge Wells Local Plan strategic model will continue to use NTEM 7.2 to form the Core Scenario. Sweco will also undertake a sensitivity scenario with the latest growth rates using NTEM 8 in Stage 2 to confirm this position and understand if, and if so where, using different growth rates may see different mitigation proposals.

Our focus for Stage 2 modelling is therefore on creating two Reference Case (RC) scenarios, one set based on Version 7.2 growth (Core) and the other based on Version 8 (sensitivity).

Upon review of the results of these runs and the mitigations identified, the extent of additional sensitivity test modelling will be established at the start of mitigation testing in Stage 3. This will be done in conjunction with discussions with TWBC and the key stakeholders KCC and NH.

5 Review Wider Road Network

This section is focussed on reviewing the representation of links and traffic on the road network around the key Paddock Wood area in the model, with the overall aim of improving or refining link attributes where and if required. These reviews primarily focus on the congestion, demand and routing around Paddock Wood and Kippings Cross, and confirming the representation of committed transport schemes within the model and implementing any additional schemes that have come online since the original model scenario development.

5.1 Committed Road Network Schemes

Table 3 below shows a list of committed transport infrastructure schemes, being essentially that agreed to support permitted employment development at Kingstanding Way, Royal Tunbridge Wells (RTW) and several adjacent schemes on the south side of Paddock Wood.

Table 3 Committed Highway Schemes to be included in Reference Case (2038) Model Runs

	Scheme
1	Halls Hole Road/ A264 Pembury Road/ Blackhurst Lane roundabout
2	Pedestrian Crossing on A264 Pembury Road
3	Kingstanding Way - Longfield Road/ Knights Park new entrance
4	Badsell Road / Mascalls Court Road / B2160 junction realignment
5	A21/Tonbridge Road/Longfield Road upgrade to junction layout
6	A26/ A2014 Vauxhall Roundabout – remarking roundabout
7	Lambert Rd/Longfield Rd – signal timings

The committed transport infrastructure schemes understood to be implemented is based on the planning permissions for respective schemes as of August 2023. This position is the same as for previous modelling and so, unless and until changes come forward to the contrary in planning these schemes, will be retained within the reference case model scenario as detailed. Therefore, there is no change in committed highway schemes from the previous modelling scenarios.

5.2 Paddock Wood Network Attributes

In order to understand if any model refinements or upgrades could be of value in the revised model runs, a review of the network attributes in Paddock Wood and the surrounding highway network has been undertaken.

The free flow speed is given in bands of miles per hour. The speed has been adjusted in the base year model compared to actual speed limits at some locations like at the Kippings Cross roundabout. This is to artificially create extra delay, to portray current levels of traffic and delay more accurately, and to ensure realistic routing.

This process has been described in the Local Model Validation Report for the 2019 model:

'The section describes the calibration of the AM traffic model, which represents the fine tuning of the model inputs and parameters and the processes involved in ensuring and demonstrating that the base year model is accurately defined and thus a suitable tool for testing and forecasting. The calibration procedure involved the following activities:

- *Adjustment and checking of the network to ensure plausible and realistic routing of traffic in the model.*
- *Comparison of observed against modelled flows across screen lines, and at other locations.'*

The link capacity, shown in PCUs per hour, is considered reasonable and representative from a strategic model perspective. However, it is acknowledged that links around Paddock Wood will require more local analysis around mitigations and as such this would be addressed in the Stage 3 modelling as required.

Overall, when comparing what is on the ground and flow link comparison with survey data, network link attributes surrounding Paddock Wood suggest a reasonable and justifiable approach has been taken to modelling this area. Some coding adjustments against actual speed limits have been undertaken to reflect the movement of traffic more accurately within the highway network in order to meet TAG criteria with regards to flow validation. Some links to the east of Paddock Wood are representative of the wider network as it falls outside the simulation area but the overall network around Paddock Wood itself is a good fit. The reference case network remains a good representation of the strategic highway network around Paddock Wood.

5.3 Kippings Cross Junction V/C

A request has come from KCC to understand further the situation around Kippings Cross and if the highway model requires any further refinement to reflect the observed congestion and delay in the vicinity of the junction. The junction has been validated in the base year against existing flows from a manual classified turn count (MCTC) undertaken in June 2018. The outcomes of this validation exercise are set out in **Table 4**.

Table 4 Comparison of Flows between Manually Classified Turn Count (MCTC) and Baseline Model for Kippings Cross

Description	Direction	Observed	Modelled	% Diff	GEH	DMRB	GEH < 5
Arriving at Kippings Cross	Southbound from B2160	674	648	-4%	1.0	Pass	Pass
Arriving at Kippings Cross	Westbound from A21	1,128	1,109	-2%	0.6	Pass	Pass
Arriving at Kippings Cross	Eastbound from A21	1,047	1,010	-4%	1.2	Pass	Pass
Leaving Kippings Cross	Northbound to B2160	252	249	-1%	0.2	Pass	Pass
Leaving Kippings Cross	Westbound to A21	1,758	1,692	-4%	1.6	Pass	Pass
Leaving Kippings Cross	Eastbound to A21	838	840	0%	0.1	Pass	Pass

At the junction modelled flows are slightly less than observed, with no more than 4% difference, whilst all flows meet TAG criteria for passing flow validation checks.

The Base Model Volume over Capacity (V/C) at the junction is summarised in **Table 5**. The eastern A21 arm is congested in the AM peak. This arm will likely become over capacity in the forecast models. This will be highlighted within the model analysis and further detailed assessments of this junction will be undertaken with junction modelling software.

Table 5 Kippings Cross Base Model V/C (%)

Arm	AM	PM
B2160 Maidstone Road (N)	74	51
A21 (E)	97	53
Dundale Road (S)	12	19
A21 Hastings Road (W)	52	70

The base year model was validated well against observed traffic data for this junction and is considered representative of existing traffic flows.

5.4 Summary

Conclusions: Review of Wider Road Network

- The wider model network review shows that the development links and highway links around Paddock Wood are representative and do not need updating
- The analysis of Kippings Cross shows the baseline model flows are representative and do not need an update. However, it is acknowledged that there is delay occurring in the AM peak, but this can be looked at in more detail in any localised junction modelling work that may be required

6 Reference Case Development

Updated information on extant and completed developments were provided by TWBC in the 'Planning Permission and Completions Data as at 1 April 2022' spreadsheet which contained the following information:

- Extant Residential Planning Permissions as at 1 April 2022
- Residential Completions Between 1 April 2020 – 31 March 2022
- Extant Commercial Planning Permissions as at 1 April 2022
- Commercial Completions Between 1 April 2020 – 31 March 2022

6.1 Residential

A comparison between the number of dwellings previously modelled and the current data is presented in **Table 6**. There are over 700 additional dwellings within the current data.

Table 6 Reference Case Housing Summary (Dwellings)

	Previous Model	Current Data	Difference
Completions 2020-2022	-	1,206	1,206
Extant planning permissions	3,313	3,123	-190
Windfall allowance	1,670	1,426	-244
Total	4,983	5,755	772

The breakdown of the dwellings by settlement is presented in **Table 7**. Changes in the majority of settlements are relatively modest. The most notable differences (change of over 100) are Cranbrook and Sissinghurst, Hawkhurst and Paddock Wood. The changes in committed residential development presented below will be incorporated within the revised reference case forecast.

Table 7 Reference Case Housing Summary by Settlement

Settlement	Previous Model	Current Data	Difference
Benenden	81	111	31
Bidborough	27	35	7
Brenchley and Matfield	120	182	62
Capel	52	54	1
Cranbrook and Sissinghurst	415	610	195
Frittenden	29	50	21
Goudhurst	77	93	16
Hawkhurst	258	359	101
Horsmonden	84	146	61
Lamberhurst	34	41	7
Paddock Wood	1,067	1,229	163
Pembury	115	157	42
Royal Tunbridge Wells	2,128	2,174	46
Rusthall	67	46	-21
Sandhurst	36	48	13
Southborough	318	292	-26
Speldhurst	75	127	52
Total	4,983	5,755	772

6.2 Employment

A comparison between the employment floor areas previously modelled and the current data is presented in **Table 8**. There is almost 80,000m² of additional employment floorspace within the current data.

Table 8 Reference Case Employment Summary (m²)

	Previous Model	Current Data	Difference
Completions 2020-2022	-	2,472	2,472
Extant planning permissions	-4,645	72,517	77,162
Total	-4,645	74,989	79,634

Further investigation of the data indicates that the difference can largely be attributed to the Land East of Kingstanding Way development which comprises a floorspace of 74,000m² and received planning permission in 2021. This development will be added to the reference case with the trip generation taken from the Transport Assessment.

Conclusion:

Sweco expect to see a modest increase in trips within Cranbrook and Sissinghurst, Hawkhurst and Paddock Wood due to the increase in residential development. There is also likely to be a higher increase in traffic and congestion to the north of Tunbridge Wells due to the addition of the large Kingstanding Way development.

7 Local Plan Development

Updated information on Local Plan developments was provided by TWBC in the 'May 2023 Housing Trajectory Update for Sweco' spreadsheet for the purposes of transport modelling. This contains the latest Local Plan housing and employment development quantum.

7.1 Residential

The spreadsheet contains housing supply figures up to 2038, 15 years post-adoption. The settlement with the most dwellings is Paddock Wood. This can largely be attributed to 'The Strategy at Paddock Wood' development which comprises 2,633 dwellings. As advised by TWBC these will be split across the model as follows:

- South-east quadrant (Redrow/Persimmon): 1,284 dwellings
- South-west quadrant (Dandara): 488 dwellings
- North-west quadrant (Crest): 771 dwellings
- North-east quadrant: 90 dwellings

The remaining allocated developments are largely smaller sites of no more than 200 dwellings. Trips from these zones will be assigned to the relevant zone within the existing model structure.

The most notable exclusion since the previous modelling is the removal of the Tudeley Village development which comprised 2,800 dwellings (2,100 within the plan period).

TWBC has advised that they are considering two Local Plan growth scenarios based on housing allocations within the 10 year (up to September 2034) and 15 year post-adoption (up to 2038) Local Plan periods. Therefore, at the request of TWBC, two post-adoption Local Plan scenarios will be modelled as follows:

- Local Plan Scenario 1: comprises the full quantum of development in the current proposed allocations spreadsheet provided – Includes all pre- and post-2034 housing allocations into a single "10 year post-adoption" model run.
- Local Plan Scenario 2: as per scenario 1 plus the additional allowance for further housing post-2034 to provide housing growth to meet the full 15-year housing need, based on a continuation of the revised strategy, and thus, the full "15 year post-adoption" (2038) model run.

For Local Plan Scenario 2 TWBC has requested that additional housing to be completed post-September 2034 is including within the modelling. As advised the following additional dwellings will be included in the model:

- 811 dwellings at Paddock Wood to be allocated to the South-east quadrant
- 392 dwellings spread across Royal Tunbridge Wells
- 140 dwellings at Pembury
- 833 dwellings distributed across the borough as per the windfall distribution

The breakdown of Local Plan dwellings for each scenario is presented in **Table 9**. The numbers from the previous model are also presented for comparison. The removal of the Tudeley Village site results in a large decrease in dwellings within the settlement of Capel.

For Local Plan Scenario 1 there is a reduction of approximately 1,000 dwellings in Paddock Wood compared to the previous modelling. With the full 15 year post-adoption Local Plan growth, this increases to a similar quantum as the previous modelling in Scenario 2. There is also a large increase in dwellings in Royal Tunbridge Wells in Scenario 2 compared to both the previous modelling and Scenario 1.

Table 9 Local Plan Housing Summary by Settlement

Settlement	Previous Model	Local Plan Allocations (Scenario 1)	Additional Local Plan Growth Allowance (Scenario 2)	
			Additional Housing	Total
Benenden	92	67	15	82
Bidborough	0	0	8	8
Brenchley and Matfield	58	15	30	45
Capel	2,800	0	13	13
Cranbrook and Sissinghurst	244	199	55	254
Frittenden	28	0	5	5
Goudhurst	0	0	19	19
Hawkhurst	99	70	56	126
Horsmonden	280	190	27	217
Lamberhurst	28	28	14	42
Paddock Wood	3,673	2,663	913	3,576
Pembury	349	311	154	465
Royal Tunbridge Wells	1,245	1,286	923	2,209
Rusthall	15	15	23	38
Sandhurst	26	13	8	21
Southborough	26	0	82	82
Speldhurst	11	11	27	38
TOTAL	8,974	4,868	2,372	7,240

7.2 Employment

Three employment sites were included in the data provided which are summarised in **Table 10**. A reduced quantum of employment at Paddock Wood is proposed, proportionate to the reduction in housing proposed for the area as part of the Local Plan. As advised by TWBC trips for the two Paddock Wood sites will be loaded on to the North-east quadrant. The remaining site will be allocated to the relevant model zone within Hawkhurst. The full quantum of employment development will be included in both Local Plan scenarios.

Table 10 Local Plan Employment Sites

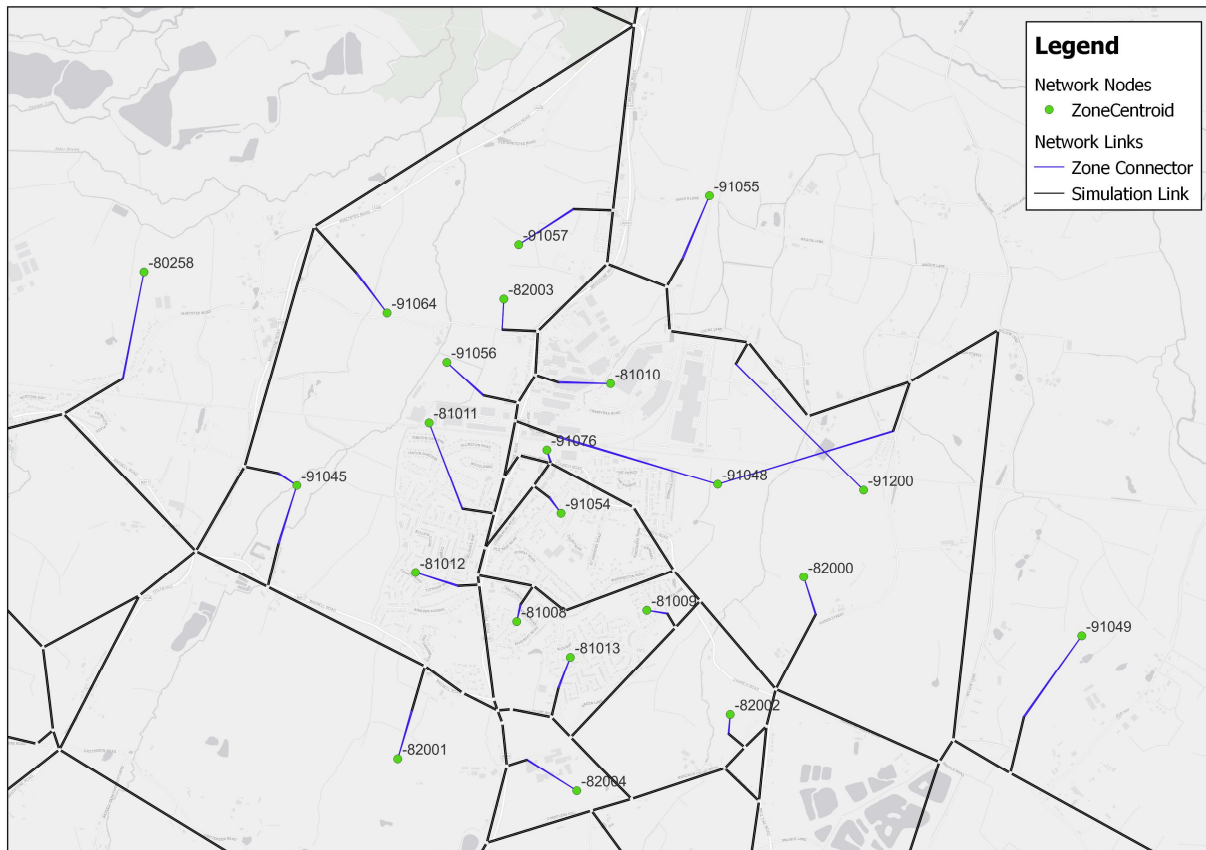
Site Address	Settlement	Size (m ²)
Land adjacent to Transfesa Rd	Paddock Wood	17,250
Swatlands Farm	Paddock Wood	18,150
Hawkhurst Station Business Park	Hawkhurst	4,500

7.3 Paddock Wood Development Zone Loading

A review has been undertaken at the request of TWBC and KCC to ensure that the links from current and new developments around Paddock Wood are connected to the most appropriate highway links in the area. This is to ensure that the wider routing is best represented within the highway model.

Figure 3 shows the loading points for Paddock Wood onto the highway network. This set up has been created to cover both the Reference Case and Local Plan. Thus, in terms of the Reference Case some of these zones will have limited to zero demand as they are mainly created to cover Local Plan development. The map shows the key local roads the connectors link to.

Figure 3 Paddock Wood Development Zone Loading Points on Highway Network



A description of where each zone connector joins the highway network is provided in **Table 11**. It should be noted that zone loaders are not always representative of a single location where traffic joins the network but are often used as a representative location for multiple access points. No changes are required to be made to the zone loading of the model.

Table 11 Paddock Wood Zone Connection Points on Highway Network

Zone	Access Point(s)	Quadrant	LP Houses / Employment
82000	Queen Rd/ Pearsons Green Rd/Church Rd/Mile Oak Rd	South-east	899 houses (LP Scenario 1) 1,467 houses (LP Scenario 2)
82001	Morgan Wy joining B2017 Basell Rd	South-west	244 houses
82002	Mascalls Court Road, joining Mascalls Ct Ln and Mile Oak Rd	South-east	385 houses (LP Scenario 1) 628 houses (LP Scenario 2)
82003	Unnamed road joining Maidstone Road (left side) between Nettlestead Ct and Rosemary Pl	North-west	309 houses
91045	AP1: A228 Maidstone Rd opposite Capel Grange Residential Home AP2: Badsell Road near Tudeley Brook passing under road	South-west	244 houses
91048	AP1: Queen St near Five Furlong Country Park AP2: Hop Pocket Lane joining Maidstone Rd	North-east	45 houses
91055	Lucks Lane north of Circatron	North-east	45 houses 18,150m ² employment
91057	Maidstone Road at Paddock Wood Garden Centre	North-west	231 houses
91064	A228 Whetsted Road/Maidstone Road opposite Whetsted Road	North-west	231 houses
91200	Lucks Lane opposite New Barns Farm	North-east	17,250m ² employment

7.4 Summary

Conclusion: Local Plan Developments

Sweco would expect to see a considerably lower Local Plan impact within Capel and the surrounding areas, due to the removal of Tudeley Village, compared to the previous modelling.

There is also expected to continue to be a high impact around Paddock Wood due to the quantum of revised Local Plan development, particularly focussed on the South-east quadrant. This impact will be lower than the previous modelling in Local Plan Scenario 1 (reduced growth within Paddock Wood) but of a similar magnitude in Local Plan Scenario 2.

The cumulative impact of the large number of additional dwellings within Royal Tunbridge Wells in Local Plan Scenario 2 is also likely to result in increases in traffic and congestion in that settlement in this scenario.

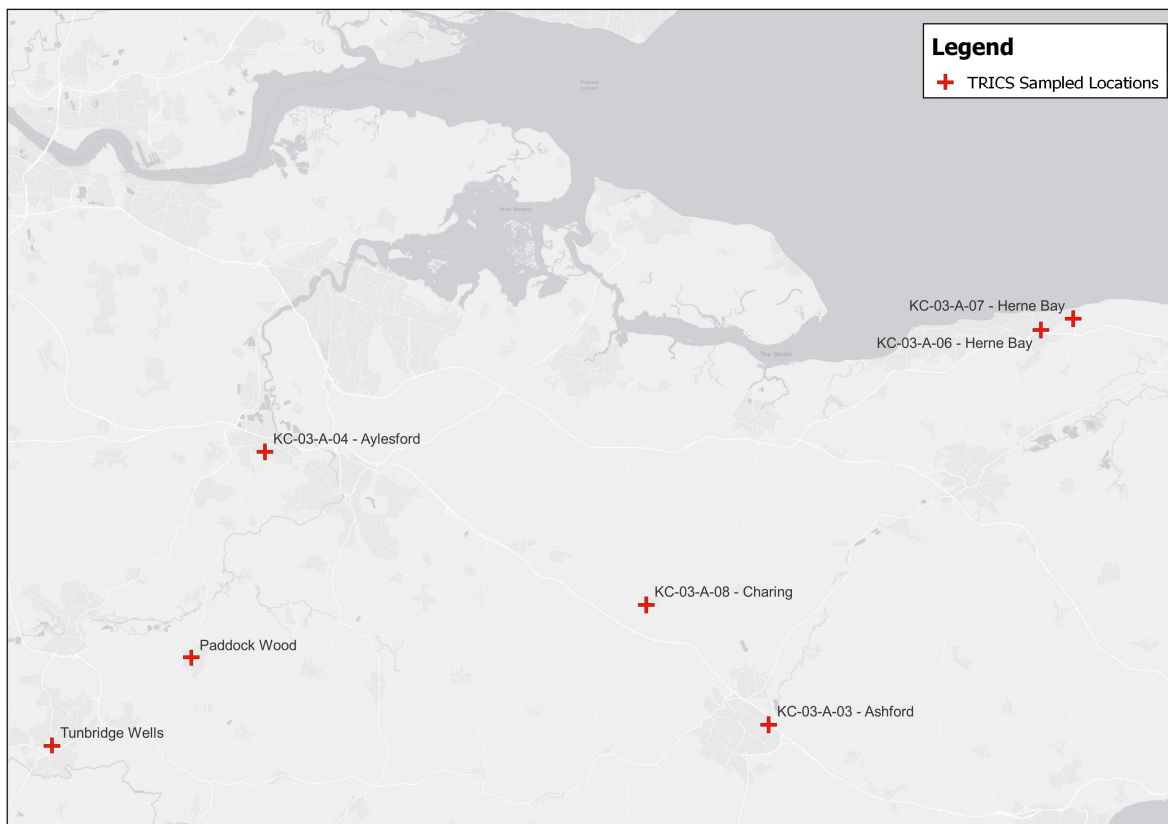
8 Local Plan Residential Trip Rates

A request has come in from KCC to review the Local Plan residential trip rates to ensure they are representative of what is expected for similar developments. **Table 12** and **Figure 4** highlight the locations of the developments used to calculate the TRICS rates for C3 residential developments in the Local Plan modelling.

Table 12 TRICS Sites used to Establish Tunbridge Wells Local Plan Trip Rates

Site ID	Dev. Type	Location	Postcode	Main Location Type	No. Dwellings	Total Bedrooms	Parking Spaces	Date Surveyed
KC-03-A-03	MIXED HOUSES & FLATS	ASHFORD	TN24 0FR	Suburban Area	51	157	110	July 2016
KC-03-A-04	SEMI-DETACHED AND TERRACED	AYLESFORD	ME20 6FN	Edge of Town	110	330	195	September 2017
KC-03-A-06	MIXED HOUSES & FLATS	HERNE BAY	CT6 6DF	Suburban Area	363	1007	789	September 2017
KC-03-A-07	MIXED HOUSES	HERNE BAY	CT6 6HZ	Edge of Town	288	934	891	September 2017
KC-03-A-08	MIXED HOUSES	CHARING	TN27 0GX	Neighbourhood Centre	159	569	480	May 2018

Figure 4 Locations of TRICS Sites used to Establish Tunbridge Wells Local Plan Trip Rates



The TRICS sites used were selected due to their size and location close to key local centres within the South-East of England. This is seen as representative of the sites proposed in the Tunbridge Wells Local Plan. They are within the boundary of Kent county and are seen as the most representative of available data.

The summary of the TRICS trip rates included in the calculation can be found in **Table 13** below.

Table 13: TRICS Trip Rates for Residential Development

Type	TOTAL VEHICLE			
	AM Peak (0800-0900)		PM Peak (1700-1800)	
	Dep	Arr	Dep	Arr
Residential	0.378	0.146	0.157	0.371

Table 14 below shows a high level comparison in TRICS rates between the Tunbridge Local Plan modelling and the previous highway analysis work as part of the Local Plan modelling for Tonbridge and Malling, as detailed in their 2018 transport assessment. For residential sites, the Tunbridge Wells TRICS rates are higher than those used in Tonbridge and Malling, which were also subject to a further 10% reduction in certain locations.

Table 14: Comparison between Tunbridge Wells Local Plan and Tonbridge and Malling Local Plan Residential TRICS Trip Rates

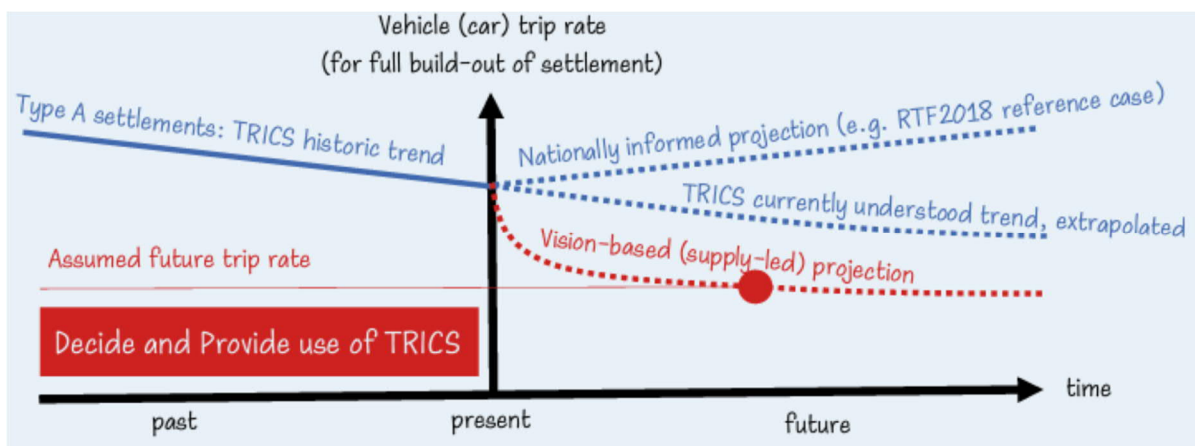
	Tunbridge Wells TRICS		Tonbridge and Malling TRICS	
	Dep	Arr	Dep	Arr
AM	0.378	0.146	0.330	0.116
PM	0.157	0.371	0.126	0.277

Source 1: Tonbridge and Malling Local Plan Transport Assessment, May 2018, Mott MacDonald

Our core Reference Case and Local Plan scenarios will not make any adjustments in the core scenarios for additional take up of sustainable transport or internalisation of trips. As a result, Sweco believe the trip rates are representative and are actually taking a ‘worst case’ position.

The TRICS (2021) ‘Guidance Note on the Practical Implementation of the Decide & Provide Approach’ shows that historic trip rates are not a true guide to future trip rates.

Figure 5 TRICS Guidance Extract



In particular, TRICS trip rates show a trend in falling vehicular trip rates over time. It should also be noted that the Local Plan scenario is the projection for the final build out of the development. It would be expected that at this stage all associated services and infrastructure to support the growth would also be open and so more opportunity for internalisation of trips as well as use of non-car modes. As a result, it is to be expected that trip rates for planning permissions today will be higher than trips for developments in 2038 after full build out of dwellings, jobs and services. Any potential mitigations that involve changes to trip rates, mode share and / or modal shift will be incorporated into scenario testing in Stage 3, which will take account of the potential need for, and extent of mitigation proposed.

Conclusion – TRICS Trip Rates:

Sweco see the residential TRICS rates we propose for the Local Plan developments as representative for the core scenario testing around the Local Plan. For the core tests in Stage 2 without any transport mitigations, no adjustment will be made around Paddock Wood for sustainable transport impacts on vehicular use. This will be looked at in sensitivity / mitigation test scenarios in Stage 3.

9 Conclusions

Sweco present a summary of the above seven sections as an overview of the review work undertaken to date, and to confirm the evidence used as justification for the methodology for the revised Tunbridge Wells Local Plan modelling.

Section 2 South East Regional Transport Model assesses the Base model the forecasting will be based on, which concludes the use of the current model is a proportionate approach to the assessment.

Section 3 South East Regional Transport Model

9.1 Background

The Tunbridge Wells model was developed from the South East Regional Transport Model (SERTM) 2015 base year model, a strategic transport model developed by NH as part of a package of models to assess RIS schemes within England. Each of these models is a full model of the UK, with detailed modelled areas covering the respective region of the UK, and buffer network covering larger inter-regional travel.

The Tunbridge Wells model was developed from a cordon of the SERTM, using the network and demand from this developed model. As the Tunbridge Wells model was developed in 2019, it uses SERTM 2015 as the source model. NH has since re-based SERTM to a 2019 base year, undertaking new data collection exercises. As a result, NH has issued the following query around using potentially out-dated traffic data from the SERTM 2015 model, as opposed to using more recent SERTM 2019 data.

'We are aware that the traffic model you have used to date has been built using SERTM prior matrices from 2015 mobile network data. This underlying data is now 8 years old. TAG Unit M2.2 Paragraph 4.4.4 gives advice on the use of older data. If there is significant further modelling to be undertaken to address the Inspector's comments, we will require justification for the continuing use of a model built using 2015 observed movements. This is particularly so as more recent SERTM 2019 prior matrices are available to assist local authorities in building models. This information could be used to update the model or to examine whether changes to the matrices over the four year period have resulted in any material changes.'

Sweco address the comments and queries from the above in the following sections.

9.2 TAG Unit M2.2

'This underlying data is now 8 years old. TAG Unit M2.2 Paragraph 4.4.4 gives advice on the use of older data.'

TAG Unit 2.2 states the following on use of older data for modelling. Text in bold will be further analysed.

*'Practitioners should establish evidence on scale of changes to land use and demographic characteristics, transport networks, and travel patterns, with more attention given to the key movements in the model internal area and use this evidence to assess the validity of 'old' data sources and their suitability for the intended use(s) of the model to judge their suitability for those use(s). **Former guidance** (withdrawn sections of the Design Manual for Roads and Bridges) **indicated that models should not be used without justification where the source data is more than five years old** when used for detailed scheme appraisal because there might be significant changes to the travel patterns and traffic level. **This simple threshold should not be used**, as there can be significant changes that would make the use of more recent data inappropriate or **there may have been little change and older data may be acceptable**. Changes such as **the closure or opening of a major retail centre or major transport infrastructure** such as a **new bypass** would be expected to **result in the need to collect and use more recent data**.'*

Previous guidance about the longevity of validated transport models has now been retracted. There is only one major scheme to have been implemented in the study area between 2015 and 2019: The A21 upgrade scheme. This scheme was opened in 2017, which is prior to the development of the Tunbridge Wells model and hence has been captured during the traffic count collection and model calibration and validation.

9.3 TAG Proportionate Update Process

The TAG Proportionate Update Process (PUP) provides guidance on when models should be updated in light of new evidence. Clearly, a full model re-basing every year is not a proportionate response, and this is evidenced by the guidance published by the Department for Transport.

We note the following points from the PUP:

- *'(There is no need to update the model where) adopting the change would require significant increase in the resources, cost, and/or time needed to prepare the decision advice'.*

Fully re-basing the model in order to react to changes in demand and zoning between SERTM 2015 and 2019 would require a significant undertaking in both time, cost and resourcing. Additionally, all model runs considered as part of this Local Plan Modelling commission would need to be re-produced: Previous Reference Case, Previous Local Plan including Tudeley Village, TEMPro 7.2 Reference Case, TEMPro 7.2 Updated Local Plan and TEMPro 8 Sensitivity Tests. This very large undertaking is not considered proportionate to giving an understanding of the potential impacts of the proposed Local Plan allocations at this stage.

- *'The Department expects that such decisions should be made on a scheme by scheme basis and be based on balancing the need to ensure decisions are based on up-to-date evidence with the need to support decision makers in delivering their programme'.*

The above guidance suggests that decisions can be made based on the requirements of decision makers (KCC, TWBC, Local Plan Inspector) to meet programmes whilst ensuring models are fit for purpose regarding the composite data. As such, in order to meet the programme for submission required by TWBC, Sweco consider that there is insufficient evidence or guidance suggesting that an update to these matrices is required. Therefore, the 2018 base year Tunbridge Wells model is suitably calibrated, validated and checked against current traffic levels to provide a robust understanding of traffic flows in the future.

9.4 Additional Information about the Tunbridge Wells Model

'This is particularly so as more recent SERTM 2019 prior matrices are available to assist local authorities in building models. This information could be used to update the model or to examine whether changes to the matrices over the four year period have resulted in any material changes.'

Sweco understands and acknowledges the value in using the most up to date SERTM data in demand modelling, however updates to the Base model are beyond the scope of the current project. It is also considered important to ensure consistency between modelling runs, so that the impacts of the revised Local plan growth scenarios can be easily identified.

In the model development process, the SERTM matrices were used to identify demand between SERTM zones. However, this zoning system is significantly coarser than that used in the Tunbridge Wells model. As such, during the initial base year matrix development process, a TAG-compliant process was used to infill these shorter distance trips and calibrated and validated against new traffic counts within Tunbridge Wells. The demand from SERTM, therefore, is not a significant cause of demand between internal model trips and will not cause a major change between SERTM versions. Sweco have also checked model flows at a key junction in the area against WebTRIS permanent ATCs, showing good correlation between

the two and suggesting that traffic flows and patterns have not changed significantly since model development, even accounting for the impacts of the Covid-19 pandemic. This analysis can be found in the Section 3 of this report.

9.5 Summary

Conclusion: SERTM Review

In response to the comments made by NH, Sweco acknowledge that newer SERTM 2019 matrices are available, which would provide a more up-to-date understanding of the calibrated and validated SERTM model movements within the South-East of England.

However, with our understanding of this model and commission, it is not considered proportionate to the scale of the project to update the Tunbridge Wells Model with SERTM 2019 matrices, as backed up by TAG Unit 2.2 and the Proportionate Update Process discussed within this Chapter. In addition, the Tunbridge Wells base model utilised a TAG-compliant process to infill shorter distance trips with the model validating well against observed traffic count data.

Therefore, Sweco do not propose an update of the SERTM-based, base year matrices which underpin the Reference Case and Local Plan models.

Baseline Traffic Levels Review presents observed traffic flow changes post Covid. Sweco conclude that the baseline data and model is capable of representing post Covid travel demand, and therefore there is no need to undertake a re-basing exercise.

Section 4 Growth Factors for Surrounding Area reviews the latest DfT National Trip End Model (NTEM) updates. The previous modelling used NTEM 7.2 which contains higher levels of growth compared to the recently released NTEM 8. Based on the Stage 1 analysis, the revised Core Scenario will continue to use NTEM 7.2 as this accords with current government methodology and will provide a "worst-case" assessment. It will be logical to undertake a Sensitivity Test with the latest growth rates using NTEM 8 to compare model performance under the different growth assumptions. The core and sensitivity scenarios will be confirmed at the start of Stage 3 when the extent of Stage 2 modelling and Stage 3 mitigations will be fully understood.

Section 5 Review Wider Road Network provides detail about the network characteristics of the model. A need for additional highway schemes to be implemented in the new Reference Case model has not been identified. Zone loading can be seen to be well represented within Paddock Wood and accurately depicts where trips from new developments would join the strategic highway network. Network attributes around Paddock Wood can be seen to be largely representative of real-world conditions. Junction flows at Kippings Cross roundabout in the base model can be seen to meet TAG criteria for all junction arms, presented with a junction volume over capacity table to show where delay could be expected at the junction. Any further localised specific issues can be picked up through the undertaking of local junction modelling as part of any detailed mitigation analysis (Stage 3).

Section 6 Reference Case Development Updates summarises the quantum of development to be included within the Reference Case. There is expected to see a modest increase in trips within Cranbrook and Sissinghurst, Hawkhurst and Paddock Wood due to the increase in residential development in these settlements. There is also likely to be a higher increase in traffic and congestion to the north of Tunbridge Wells due to the addition of the large Kingstanding Way development.

Section 7 Local Plan Development outlines the quantum of Local Plan development to be included within the revised modelling. There is likely to be a considerably lower Local Plan impact within Capel and the surrounding areas, due to the removal of Tudeley Village, compared to the previous modelling. The revised Local Plan development comprises a considerable quantum of development at Paddock Wood, albeit of a lower magnitude compared to the previous modelling, which is particularly focussed on the South-east

quadrant. This is expected to result in increases in delay and congestion in this area. The cumulative impact of additional dwellings within Royal Tunbridge Wells, which is of a similar magnitude to the previous modelling, is also likely to result in increases in traffic and congestion in this settlement.

Section 8 Local Plan Residential Trip Rates presents the TRICS developments used to calculate trip rates for new local plan housing developments. The TRICS trip rates proposed for the Local Plan developments are considered as representative for the core scenario testing around the Local Plan. For the core tests, no adjustment will be made around Paddock Wood for sustainable transport impacts on vehicular use and internalisation, ensuring a robust assessment. This will be revisited in sensitivity / mitigation test scenarios in Stage 3.