



Horsham Transport Study

Local Plan 2039 Transport Assessment -
2023 Update

EXECUTIVE SUMMARY

On behalf of **Horsham District Council**

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For and on behalf of Stantec UK Limited				

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Executive Summary

1.1 Introduction

- 1.1.1 Stantec has been commissioned by Horsham District Council to produce a high-level transport assessment to support the emerging Local Plan 2039. The assessment has been undertaken using a SATURN highway model. SATURN is an industry standard modelling package, which has been used to assess the impact of a number of development scenarios on the local highway network managed by West Sussex County Council, along with assessing impacts on the Strategic Road Network, managed by National Highways.
- 1.1.2 The modelling work is also used to provide outputs for more detailed junction modelling, using industry standard modelling packages, such as Junctions 10 (Roundabouts and Priority Junctions) and LinSig (Traffic Signalled junctions) to inform the mitigation strategy required to support the Local Plan at a more detailed level. Models have been developed to represent potential impacts at the end of the Local Plan period (2039), for the AM (0800-0900) and PM (1700-1800) peak hours.
- 1.1.3 The assessment is undertaken as per Ministry of Housing, Communities and Local Government (MHCLG) Planning Practice Guidance, Transport Evidence Bases in Plan Making and Decision Taking (March 2015)¹. The mitigation strategy will be required to mitigate the impact of the Local Plan development and as per the guidance the emphasis on mitigation should be delivery of a sustainable transport measures first and foremost, which will enable growth, whilst also considering environmental impacts and climate change targets.
- 1.1.4 The modelling undertaken is based on the most unbiased and realistic set of assumptions. Background forecasts only include schemes where the likelihood of them going ahead is near certain, or more than likely.
- 1.1.5 The following are not included directly within the modelling, but may have an influence on future traffic conditions:
- Peak spreading and change of travel time – The model is a peak hour only and does not reflect behaviour seen where people will change the time of their journey to avoid the worst congested parts of the peak.
 - Increases in home working – the COVID-19 pandemic has seen an increase in home working and there are some indications, that for some, this may become a more common occurrence in the future and as the technology improves, this may become more of the norm in some areas of work.
 - Autonomous Vehicles and other future innovations - the impact of ‘disruptive’ technologies such as autonomous (i.e. ‘driverless’) vehicles is unknown at this time.

1.2 Local Plan Development

- 1.2.1 A number of scenarios have been taken through the modelling process and outputs of these used to inform the development of a preferred development scenario. More detailed modelling has then been undertaken in late 2022 on the preferred scenario to inform the mitigation strategy required to demonstrate that the Local Plan can be delivered and the plan viable, in the context of transport.
- 1.2.2 The developments included within the preferred scenario are shown in the table below, split into the strategic sites and non-strategic sites. Further updates to these Local Plan

¹ <https://www.gov.uk/guidance/transport-evidence-bases-in-plan-making-and-decision-taking>
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development scenarios, based on the latest draft of the Regulation 19 submission, have been provided by HDC in November 2023.

Preferred Scenario – Strategic Sites (December 2022)

Development Location	Plan Period (Dwellings)	Overall (Dwellings)	Employment – B1 (Plan Period) (M ²)	Employment – B2 & B8 (Plan Period) (M ²)
West of Ifield (SA101)	1,600	3,000	2,700	6,300
West of Southwater (SA119)	840	1,200	8,000	16,000
East of Billingshurst (SA118)	650	650	660	1,540
North Horsham densification (SA296)	500	500	11,000	8,500
TOTAL	3,590	5,350	22,360	32,340

*Employment at North Horsham (SA296) reflects recent planning permissions not originally included in the baseline 'Reference Case' modelling

Preferred Scenario – Settlement Sites (non-strategic) (December 2022)

Development Location	Plan Period (Dwellings)	Overall (Dwellings)	Employment – B1 (Plan Period) (M ²)	Employment – B2 & B8 (Plan Period) (M ²)
Ashington	300	300		
Barns Green	105	105		
Broadbridge Heath	150	150		
Cowfold	105	105		
Henfield	325	325		
Horsham – Forest ward	100	100		
Horsham – Novartis	300	300		
Lower Beeding	57	57		
North Horsham parish	300	300		
Partridge Green	255	255	1,000	8,000
Pulborough	245	245	1,000	6,000
Rudgwick and Bucks Green	66	66		
Rusper	38	38		
Small Dole	40	40		
Southwater (land to north)	0	0	0	3,000
Steyning	265	265		
Storrington & Sullington	125	125		
Thakeham	65	65		
Warnham	20	20	0	0
West Chiltington	38	38		
TOTAL	2,899	2,899	2,000	17,000

*Housing at Horsham – Novartis reflects a planning permission not originally included in the baseline 'Reference Case' modelling

- 1.2.3 Since the modelling was conducted the development West of Southwater has now been updated to 735 dwellings within the plan period, this is a relatively modest reduction in comparison to the 840 modelled within the plan period and will cause a negligible impact within the modelling outputs.
- 1.2.4 It is also not now expected that an additional 500 dwellings will be delivered at North Horsham within the Plan period (the revised trajectory reduces this to 60), however given the advance stage of already-completed infrastructure provision on this site, and that the full site capacity remains 500 additional, it is prudent that the 500 remains within the forecast model to represent a 'worst-case' scenario.

1.3 Transport Modelling Overview

- 1.3.1 The transport model used to inform the impact of the Local Plan, is a SATURN highway model. SATURN is an industry recognised modelling package, used widely in the assessment of developments and schemes. During the process of model development, West Sussex County Council and National Highways have been engaged and have agreed the use of the modelling tool and the process for developing the forecast models to assess the Local Plan impacts.
- 1.3.2 A base year model was developed to represent traffic conditions in 2019. This model uses independent traffic count and journey time data to validate the model to a standard as set out within guidance produced by the Department for Transport.

1.4 Reference Case Forecast Model

- 1.4.1 A Reference Case forecast model has been developed to represent future traffic conditions at the end of the plan period (2039), without the consideration of the Local Plan development. This model includes all committed development within Horsham District, including development within the adopted Local Plan and in neighbourhood plans that were 'made' before May 2021, as well as any committed development within neighbouring authorities. A suite of ten neighbourhood plans in Horsham District were 'made' on 23 June 2021, three of which (Henfield, Upper Beeding and Ashington) included site allocations. These allocations were, however, accounted for in the transport modelling as proposed Local Plan allocations.
- 1.4.2 For neighbouring authorities only, a further level of growth is added in order to represent expected growth from developments up to 2039 more accurately. This growth is derived from the Department for Transport National Trip End Model (NTEM) version 7.2. NTEM includes housing, jobs and geodemographic predictions for all planning authorities. This additional growth assumption is not applied within the Horsham District itself as adding both the level of housing within Horsham given in NTEM and growth associated with the Local Plan would result in double counting when applying the Local Plan developments to the forecast model.
- 1.4.3 For each of the neighbouring authorities, the housing and job numbers within NTEM are adjusted downwards, based on the authorities committed development information, which avoids any double counting. This results in the combination of the adjusted NTEM growth and the specific committed developments within the neighbouring authorities matching expected NTEM growth.

Forecast Development Trip Rates

- 1.4.4 For all developments added to the models (Reference Case and Local Plan), vehicle trip rates have been derived using the industry standard TRICS software. A trip rate is produced by land use type and provides the number of trips entering or leaving a development based on a rate per specified measure e.g. for residential this is per household and for employment per 100 square metres. These trip rates were agreed with WSCC.

1.5 Local Plan Forecast Model

- 1.5.1 The Local Plan model builds upon the Reference case model by adding the Horsham Local Plan development information provided by HDC as detailed above.
- 1.5.2 For the strategic development sites, where housing, jobs, schools and other ancillary uses are provided together, a reduction in vehicle trip rates was made to represent trip internalisation (i.e. trips that would take place between the uses provided). The factor used – a 12% reduction on all trips both arriving at and leaving the respective sites to reflect internalisation – was based upon a figure agreed by a planning inspector to support the North Horsham development at the planning application stage.
- 1.5.3 The outputs from the Local Plan model are then compared to the Reference Case model outputs to show the impact of the Local Plan scenario. From this an evaluation is made to determine the requirements of further highway mitigation.

1.6 Sustainable Transport Mitigation

- 1.6.1 Consideration has been given to sustainable travel measures that could impact on how people travel in the future and achieve a mode shift from car use.
- 1.6.2 The local plan development sites are proposed to comprise of sustainable transport measures that promote and encourage more sustainable active travel modes. This includes enhanced public transport, cycling and walking facilities compared with what might normally be expected from development.
- 1.6.3 Further Local Plan strategic off-site sustainable mitigation measures have been discussed. These would be led by WSCC and supported by funding from the strategic developments and potentially general CIL monies. The ideas are used to inform a level of car trip reduction in addition to the internalisation and the soft measures outlined previously. The car trip reduction rates are input within the Local Plan Forecasts.
- 1.6.4 Junctions initially identified as requiring further mitigation were analysed to understand whether the capacity shortcomings could be addressed through further sustainable mitigation measures (i.e. those likely to reduce car trips) connected with the Horsham Transport Strategy and to minimise as far as possible the need for physical mitigation. The unmet demand was also determined for each junction.
- 1.6.5 The proposed measures at the junctions listed below included the prioritisation of active modes and public transport measures, where specifically feasible to reduce localised car trips further, and the general projection of virtual mobility (i.e. increased opportunity to work from home, due to technological advances reducing need to commute and reduce face to face meetings). The effect was to reduce car trips.
- 1.6.6 In addition, where junctions are signalised and only just over the threshold for requiring mitigation, the signal timings and Volume to Capacity ratio (V/C) on all arms were examined, to explore whether there would be an opportunity to alter the signal timings. This typically involved looking at where the worse performing movement could be given more green time, without unduly impacting upon opposing movements which had plenty of spare capacity.
- 1.6.7 The following junctions were seen to be only just over the threshold based on the preferred strategy and could be dealt with through the measures above. A junction location map is included within annex 1.
 1. A264/A24 Dumb-bell Roundabout at South Broadridge Heath, Horsham (Sustainable measures) (this is part of the recently upgraded road layout, specifically the A264/A24 southern roundabout on the western side of the A24).

2. A281 East Street / Park Way Junction, Horsham (Optimisation of traffic signals)
3. A264 / B2195 Moorhead Roundabout (Optimisation of traffic signals)
4. B2195 Harwood Road/Crawley Road/ Forest Road Junction (Optimisation of traffic signals)
5. A29/ A264 Five Oaks Roundabout (Sustainable Measures)
6. A283 /A29 Roundabouts, Pulborough (Sustainable Measures)

1.7 Highway Mitigation

- 1.7.1 Where it has been demonstrated that sustainable travel measures would not be enough to fully mitigate the impacts of the Local Plan, further mitigation measures have been developed and assessed.
- 1.7.2 The following junctions are shown to require physical mitigation (i.e. some degree of upgrade) within Horsham District (note junctions on the Strategic Road Network (SRN) are looked at separately). A figure showing the junction locations is found within Annex 1.
 1. A24 / A272 Buck Barn
 2. A24 / B2237 Hop Oast Roundabout
 3. A24 / A283 Washington Roundabout
- 1.7.3 Detailed junction modelling for each of these junctions has been undertaken and shown that a mitigation scheme can be provided, which mitigates the impact of the Local Plan.
- 1.7.4 The A24/A272 Buck Barn junction has been tested within a more detailed modelling package (LinSig) using traffic flows from the SATURN model. Additional right turning lanes to the A272 westbound from the A24 and two lanes through the staggered junction from the A272 carrying on westbound are proposed. The modelling outputs indicate that the mitigation is effective in relieving congestion impacts resulting from the Horsham Local Plan and background forecast traffic growth as the junction output results show operation within capacity.
- 1.7.5 At the A24 Hop Oast roundabout, signalling the roundabout is proposed. This has also been modelled in a similar fashion in a more detailed modelling package (LinSig). This is shown to work within capacity with the Local Plan traffic and therefore is deemed to be mitigated. The modelling has also been undertaken with an alternative design to include bus priority at the junction, however, this did not mitigate the impact for general highway traffic and the design without the bus priority demonstrated that buses also benefit. The design without the bus priority will not preclude this coming forward at a future date.
- 1.7.6 At the A24/A283 Washington Roundabout, additional left turn lanes provide additional capacity to alleviate congestion increases from the Local Plan allocations. Any scheme to improve this junction is likely to need sensitive design to ensure that landscape impacts on the South Downs National Park are mitigated, although the proposed design is within the existing highway boundary. It is also noted that should the Arundel bypass progress, this is likely to have an impact on how flows interact at Washington Roundabout, with flows from the west expected to decrease and flows from the south expected to increase, depending on timescales this may change requirements at Washington Roundabout.

- 1.7.7 The schemes provided and high-level scheme costs (including 20% Risk and Contingency and 44% Optimism Bias²), are provided within the table below.

High Level Scheme Costs

Scheme	High Level Cost (Including Optimum Bias)
A24 / A272 Buck Barn	£5,175,806
A24 / B2237 Hop Oast Roundabout	£3,107,922
A24 / A283 Washington Roundabout	£3,810,572

Strategic Road Network

- 1.7.8 The assessment of the impacts of the Local Plan on the Strategic Road Network (SRN) managed by National Highways, has indicated that the A23 is already over capacity within the Reference Case model, due to the amount of additional traffic being added from the south coast towns, travelling north towards the M25 and London, as well as growth from Mid Sussex and Crawley. This additional traffic is resultant from background growth of traffic not related to the Horsham Local Plan developments and therefore the majority of impacts arise due to increases in background growth from elsewhere.
- 1.7.9 This has made the assessment of the Local Plan impacts difficult, notwithstanding that such impacts are minor compared with background traffic growth. It is therefore recommended that further discussion be held with National Highways to discuss what further means there are to quantify impacts that would specifically arise from Local Plan developments, which in practical terms will mean exploring options for mitigation in a future Road Improvement Strategy (RIS) or other multi-body delivery routes, likely to also include consideration of combined impacts from this Plan and the emerging Mid Sussex Local Plan.

1.8 2023 Study Review Update

- 1.8.1 Further updates to the Local Plan development scenario, based on the latest draft of the Regulation 19 submission, have been provided by HDC in November 2023. The updated development quanta have been analysed with traffic increases being no greater than 12 vehicles at any one site during the assessed peak hours. This difference is considered to be insignificant in the context of the peak hour trip generation changes.
- 1.8.2 Impacts of travel patterns and traffic forecasts changes due to the Covid pandemic and post covid travel trend changes have been assessed through comparison of pre and post Covid local traffic data as well as national statistics. An analysis of trip totals across surveyed traffic count sites in the Horsham district between 2019 and 2023 concluded that the impact of Covid on travel behaviour is evidently resulting in a reduction of highway travel demand with -12% reduction in the AM Peak and 7% in the PM Peak for the period of 2019 to 2023.
- 1.8.3 Where junction mitigation has been proposed, the existing 2039 forecast scenario was assessed using the projected decrease in forecast traffic growth due to Covid. At these locations, despite reduced forecast traffic growth, the analysis still indicates the need for mitigation due to impact of the Local Plan and high volume-to-capacity ratio. As such, even with the reduced 2039 traffic forecast, mitigation remains necessary as stated within the existing transport study.

² Optimism Bias is the recognised inherent bias in underestimating costs, particularly at early stages of projects when risks are unknown. 44% is the figure used by DfT in early stages of projects. See Transport Appraisal Guidance Unit A1.2 Section 3.5 ([TAG UNIT A1.2 Scheme Costs \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/106999/tag-unit-a1.2-scheme-costs.pdf))

1.9 Highway Safety Study

- 1.9.1 A road safety study was conducted to identify accident hotspots and where any significant increases in traffic, as a result of the Local Plan, may impact on safety and lead to potential need for mitigation within the Horsham District.
- 1.9.2 The study reviewed traffic collision data over a 5-year period, identifying junction accident hotspots within the district and at these hotspot locations, analysing the key causation data.
- 1.9.3 With the majority of the hotspots identified the causation was predominantly noted as driver error and no significant issues of junction design have been identified.
- 1.9.4 Junction hotspot identification was also assessed in the context of Local Plan impacts, identifying potential increases in accident rates resulting from increased traffic due to the Local Plan.
- 1.9.5 This identified 4 key junctions where it was deemed that the Local Plan traffic increases would warrant a safety mitigation. Of the 4 junctions, 3 have already been proposed within the Transport Assessment as requiring mitigation to resolve congestion issues and therefore were deemed that safety issues would be mitigated through the existing proposed junction changes. One remaining junction was earmarked and recommended for further safety review – The Great Daux Roundabout. No further work on this junction has been undertaken at this point in time and will need to be considered going forward.

1.10 Summary and Conclusions

- 1.10.1 Modelling has been undertaken to inform this Transport Assessment for the local plan preferred strategy (i.e. the preferred scenario). The work has considered, at a high level, the sustainable travel mitigation and impact on traffic levels across Horsham District and any impacts within neighbouring authorities and on the Strategic Road Network, which in this case is the A23 and M23.
- 1.10.2 Based on the capacity metrics used within this assessment, the specific mitigation measures implemented ensure that congestion hotspots earmarked within the reference case do not worsen, nor flag any additional junctions as a congestion hotspot. Furthermore, the relative impacts of Local Plan growth on the Strategic Road Network against general traffic growth are minor, with no stand-alone Local Plan mitigation currently proposed (further discussion recommended with National Highways).
- 1.10.3 Limited physical highway mitigation is proposed, with four junctions on the A24 corridor being shown to require mitigation, which is deemed to be deliverable through the Local Plan process.
- 1.10.4 Proposed sustainable travel measures (physical and non-physical) and highway physical mitigations are shown to alleviate significant increases of congestion at a given junction which result from the Local Plan preferred scenario. Furthermore, the sustainable travel mitigation measures which have been included within the modelling assessment are deemed to be conservative in terms of the mode shift away from cars, and therefore the physical mitigation requirements shown may be reduced if more ambitious sustainable transport measures and targets proposed by individual site promoters are realised.
- 1.10.5 The safety assessment has identified four junctions where mitigation is required. Three of these also require mitigation as congestion relief and safety issues would be part of these mitigation proposals, Great Daux Roundabout has also been identified as requiring mitigation for safety reasons.

Annex 1 – Junction Mitigation Location Map

