



Horsham Transport Study

Preferred Local Plan Scenario Transport Assessment

Executive Summary

On behalf of **Horsham District Council**

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Introduction

Stantec have been commissioned by Horsham District Council to produce a high-level transport assessment to support the emerging Local Plan. 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 Highways England.

The modelling work is also used to inform the mitigation strategy required to support the Local Plan and inform more detailed junction modelling, using industry standard modelling packages, where required. Models have been developed to represent potential impacts at the end of the Local Plan period (2038), for the AM (0800-0900) and PM (1700-1800) peak hours.

The assessment is undertaken as per 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 strategy, which will enable growth, whilst also considering environmental impacts and climate change targets.

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.

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.

Local Plan Development

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 on the preferred scenario to inform the mitigation strategy required to demonstrate that the Local Plan can be delivered, in the context of transport.

The developments included within the preferred scenario are shown in the table below, split into the strategic sites and non-strategic sites. These figures are subject to some minor degree of amendment as the Local Plan preferred strategy is refined (for example to reflect updated employment allocations). The impacts and modelling outputs of such amendments would show negligible differences within the models.

¹ <https://www.gov.uk/guidance/transport-evidence-bases-in-plan-making-and-decision-taking>

Preferred Scenario - Strategic Sites

| Development Location | Plan Period (Dwellings) | Overall (Dwellings) | Employment - B1 (Plan Period) (M ²) | Employment - B2 & B8 (Plan Period) (M ²) |
|-------------------------------------|-------------------------|---------------------|---|--|
| Buck Barn (SA716) | 2,100 | 3,500 | 8,800 | 21,200 |
| West of Ifield (SA101) | 3,250 | 10,000 | 2,700 | 6,300 |
| West of Southwater (SA119) | 1,200 | 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 | 7,700 | 15,850 | 31,160 | 53,540 |

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

Preferred Scenario - Settlement Sites (non-strategic)

| 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 | 290 | 290 | | |
| Christs Hospital | 20 | 20 | | |
| Cowfold | 105 | 105 | | |
| Henfield | 325 | 325 | | |
| Horsham - Forest ward | 100 | 100 | | |
| Horsham - Novartis | 300* | 300 | | |
| West of Kilnwood Vale Extension (SA341) | 350 | 350 | | |
| Lower Beeding | 57 | 57 | | |
| North Horsham parish | 300 | 300 | | |
| Partridge Green | 0 | 0 | 1,000 | 8,000 |
| Pulborough | 255 | 255 | 1,000 | 6,000 |
| Rudgwick | 66 | 66 | | |
| Rusper | 38 | 38 | | |
| Slinfold | 0 | 0 | | |
| Small Dole | 60 | 60 | | |
| Southwater (land to north) | 0 | 0 | 0 | 3,000 |
| Steyning | 240 | 240 | | |
| Storrington & Sullington | 155 | 155 | | |

| Development Location | Plan Period (Dwellings) | Overall (Dwellings) | Employment - B1 (Plan Period) (M ²) | Employment - B2 & B8 (Plan Period) (M ²) |
|----------------------|-------------------------|---------------------|---|--|
| Thakeham | 65 | 65 | | |
| Upper Beeding | 70 | 70 | | |
| Warnham | 20 | 20 | | |
| West Chiltington | 36 | 36 | | |
| TOTAL | 3,257 | 3,257 | 2,000 | 17,000 |

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

Transport Modelling Overview

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 Highways England 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.

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.

Forecast Development Trip Rates

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.

For the strategic development sites, where housing, jobs, schools and other ancillary uses are provided together, a reduction in 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 – was based upon a figure agreed by a planning inspector to support the North Horsham development at the planning application stage.

Reference Case Forecast Model

A Reference Case forecast model has been developed to represent future traffic conditions at the end of the plan period (2036), 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.

For neighbouring authorities only, a further level of growth is added in order to more accurately represent expected development growth up to 2036. 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.

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.

Local Plan Forecast Model

The Local Plan model builds upon the Reference case model by adding the Horsham Local Plan development information provided by HDC as detailed above.

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.

Sustainable Transport Mitigation

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.

The local plan development sites are proposed to comprise of sustainable transport measures that promote and encourage more sustainable active travel modes. This includes improved public transport, cycling and walking facilities.

Further Local Plan site-specific sustainable mitigation measures have been discussed and agreed with WSCC. 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.

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 determined for each junction and where this was seen to be low, the following measures were considered.

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.

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.

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:

- A283/A29 Mini Roundabouts, Pulborough (sustainable mitigation)
- A283/Amberley Road Roundabout, Storrington (sustainable mitigation)
- A29/ High Street Roundabout, Pulborough (sustainable mitigation)
- B2237/Wimblehurst Road (signal optimisation)

- Moorhead Roundabout (signal optimisation)
- Albion Way/B2237 (signal optimisation)
- East Street / Park Way Junction (signal optimisation)
- A281/New Street Junction (signal optimisation)
- A264/Langhurst Wood Road (signal optimisation)

Highway Mitigation

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 assessed.

The following junctions are shown to require physical mitigation within Horsham District (note junctions on the Strategic Road Network (SRN) are looked at separately):

- A24 / A272 Buck Barn
- A24 Hop Oast Roundabout
- A24 Washington Roundabout
- A24 / Steyning Road

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.

The A24/A272 Buck Barn junction has been tested within a more detailed modelling package (LinSig) using traffic flows from the SATURN model. A through-about arrangement is proposed, whereby the A24 carriageways pass through the centre of the roundabout island thereby increasing the capacity of the junction.

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 to include bus priority at the junction, which emphasises the importance of sustainable transport within the overall strategy.

At the A24/A283 Washington Roundabout, it is proposed to signalise the roundabout. There is also a requirement to provide some localised widening to demonstrate that the Local Plan traffic can be mitigated. Any scheme to improve this junction is likely to need sensitive design to ensure landscape impacts on the South Downs National Park are mitigated.

At the A24/B2135 Steyning Road junction, it is proposed to replace the current priority arrangement with traffic signals. This is as much a safety scheme, as it is to provide additional capacity, although there is a capacity issue on Steyning Road due to increased flows on the A24 in the future. With higher flows on the A24, any traffic from Steyning Road will have fewer opportunities to turn onto the A24 and this is seen as a safety issue for right turning traffic, wishing to travel north in particular. The increase in flows on the A24 will make it even more difficult for traffic from Steyning Road to turn to/from the A24, particularly from/to the northbound carriageway.

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 OB) |
|---------------------------|--------------------------------|
| A24 / A272 Buck Barn | £5,479,592 |
| A24 Hop Oast | £2,825,384 |
| A24 Washington Roundabout | £3,258,393 |
| A24 / Steyning Road | £748,860 |

Cowfold

In addition, in the Preferred Strategy scenario, the northern mini roundabout at Cowfold in the AM peak, is shown to be an issue for the eastbound approach. It should be noted that without mitigation, the junction becomes congested under all scenarios tested but is marginally worse than for other scenarios due to the inclusion of the Buck Barn development. Physical mitigation has been examined for this junction; however, given the constraints within the village, a suitable junction mitigation scheme has not been found. Other options examined have included:

- signal gating traffic on the approach to the village, but this does not resolve the issue on the eastbound approach and changing the junctions to priority junctions, and
- A272 traffic having priority over the A281, however, the effect of removing the pinch point for the A272 is to generate overall more traffic on the A272, and also to cause excessive delays on the A281, which is a key public transport route.

Further interrogation of the modelling has been undertaken to understand traffic using Cowfold. Whilst the majority of traffic on this section of the A272 is using it to get to Mid Sussex towns, there is a reasonable proportion which is using the A272, A281 and B2110 and accessing the A23 at Handcross to travel northwards. Through concentrating physical mitigation along the main A24/A264 route, along with a signing strategy and reduced speed limits on the A272, A281 and B2110, this should be adequate to provide mitigation for Cowfold. Such a strategy would also help to address air quality issues relevant to the Cowfold Air Quality Management Area.

Strategic Road Network Impacts

The assessment of the impacts of the Local Plan on the SRN, 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.

This has made the assessment of the Local Plan impacts difficult. It is therefore recommended that further discussion be held with Highways England to discuss what further means there are to quantify impacts that would specifically arise from Local Plan developments.

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/guidance/tag-unit-a1-2-scheme-costs))

Summary and Conclusions

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.

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.

Traffic through Cowfold is a key issue for delivery of the Local Plan, however it is felt that a combination of signing and physical measures, such as reduced speed limits on the B2110 between Lower Beeding and Handcross, should reduce the traffic using the A272/A281/B2110 route to reach the A23 and thus alleviate the impacts of the Local Plan and go some way to addressing air quality issues. Physical highway mitigation measures in Cowfold have been explored, but do not mitigate the impacts.

Proposed sustainable and physical mitigations are shown to alleviate significant increases of congestion which result from the Local Plan preferred scenario. Furthermore, the sustainable 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.