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1.0 Introduction

This Interim Report sets out the current status of work on the Crowborough Transport Study. This Study was commissioned by East Sussex County Council, Wealden District Council and Crowborough Town Council to consider the impact of developments coming forward in Crowborough through the Strategic Sites Development Plan Document.

The Study has been split into two component parts:

1. The Town Centre, for which a basic town-wide SATURN transport model was developed by external consultants (TPI) in 2011. A separate report was published in September 2011 which included a preliminary assessment of the traffic impacts of various options for the High Street. To further develop the model, comprehensive town centre parking surveys were carried out in 2012, separately reported in the ‘Crowborough Car Parking Report’. Progress on incorporating the parking survey results into the basic SATURN model will be the subject of a separate Interim Report.

2. The Jarvis Brook area, for which a VISSIM model has been developed. This extends from the A26 west travelling east to the junction of Western Road with the B2100 and also encompasses Whitehill Road. The current status of that work is the subject of this Interim Report.

2.0 Area Context

Crowborough is a rural market town situated within East Sussex, located approximately 40 miles south of Central London and 6 miles south of the historic spa town of Royal Tunbridge Wells. The town occupies a prominent position within the unique and nationally important High Weald Area of outstanding Natural Beauty (AONB) and borders the Ashdown Forest.

There is a range of shopping facilities both within the centre of the town and at Jarvis Brook. As well as a range of supermarkets, there are a number of individual retail outlets. There are a number of town centre car parks and some roads with on street parking all of which is free.

Crowborough has a large range of industrial estates and town centre type business premises. The town’s business estates include: Connors Yard, Farningham Road Jarvis Brook, Lexden Lodge, Millbrook Business Estate, and Park Road Industrial Estate.
3.0 Policy Background

The East Sussex Local Transport Plan 2011 -2026 (LTP3) is the County Council’s policy framework for transport investment over the next 15 years. The approach for Crowborough to address its challenges is set out in the approach for the North Wealden and North Lewes area. It identifies the key priorities include:

- to retain and enhance Crowborough as a service centre for the local community and surrounding settlements thereby reducing the need to travel, through the provision of local sustainable travel options;
- improvements on safe, coherent walking and cycling routes on key routes/corridors in Crowborough particularly focusing on those giving access to the town centre,
- improvements to public transport on key routes and corridors especially into and around the town centre, and
- improving access to and modal integration at the rail station.

The delivery of these measures will be dependent on the level of funding available over the life of the LTP and will be outlined in more detail through the publication of a series of 5 year Implementation Plans.

Wealden District Council’s Proposed Submission Core Strategy was subject to an Examination in Public in early 2012 and was found sound and legally compliant by the appointed Planning Inspector in October 2012. The District Council adopted the Core Strategy in November 2012 and it was adopted by the South Downs National Park Authority in February 2013.

The Wealden CS identifies that around 300 homes are expected to be provided in Crowborough over the Plan period up to 2027. These homes will be provided across three strategic allocations:

SDA8 – Pine Grove (110 homes)
SDA9 – Jarvis Brook (around 30 homes)
SDA10 – South West Crowborough – Walshes Farm (around 160 homes)

At the Examination in Public (EIP), the County Council highlighted that development of the quantum proposed in the town could, from a highways perspective, be accommodated albeit further work would be required to determine the deliverability of consequential transport mitigation measures associated with any of the Site Development Allocations in Crowborough. Any identified transport mitigation measures will be identified in the Infrastructure Delivery Plan (IDP) as part of its continual updating and will need be funded through development contributions.
The transport modelling work currently being undertaken by the County Council in partnership with Wealden District Council and Crowborough Town Council, and the subject of this report, is part of the further work highlighted at the EIP. This will inform the Strategic Sites Development Plan Document currently being prepared by Wealden District Council which will be published for receiving representations on 17th June and will be open until 29th July 2013.

4.0 Background: Local Area Transport Strategy (LATS)

A Local Area Transport Strategy (LATS) was developed for Crowborough by the County Council in 2002, in partnership with Wealden District Council and Crowborough Town Council. The LATS document set out a framework for future investment of integrated transport improvements in the town through the Small Towns Package of the East Sussex Local Transport Plan. The LATS approach has been superseded following the adoption of the Local Transport Plan 2011 – 2026. The approach for addressing transport issues over the life of the current LTP is set out within the wider approach for the North Wealden and North Lewes District spatial area.

A package of proposals was developed from the LATS introducing measures that were intended to give people more travel choices in Crowborough. The proposals aimed to improve access and safety for all road users, particularly pedestrians, bus users and cyclists whilst enhancing Crowborough’s economic vitality.

In 2002 a Feasibility Study of the Jarvis Brook Railway bridge was carried out as part of the Local Area Transport Strategy (LATS) for Crowborough in partnership with the District and Town Councils. This study investigated the improvement of pedestrian facilities at Jarvis Brook Railway Bridge which also has a height restriction of 12’9”.

These proposals formed the basis of the Crowborough Steps Forward public exhibition held in July 2003. The aim of the exhibition was to raise public awareness about transport issues and to seek views on the Crowborough Steps Forward proposals. This gave local people the opportunity to contribute to, and influence, the development of the proposals and also to provide guidance on investment priorities for now and in the future. The overall package of proposals received over 62% support.

Many residents along Western Road were concerned at the number of Heavy Goods Vehicles using a residential road to access the industrial estates from the A26. Along this road many of the properties do not have access to off street parking which leads to parking on pavements that makes it unattractive and hazardous for pedestrians. The residents were very supportive of a new fully accessible bridge at Jarvis Brook as this would have the benefit of reducing the need for large lorries having to access the industrial estate along residential roads and provide a safe access from Western Road to the Jarvis Brook shopping parade.
Another major concern was the speed of traffic along many of the roads in the town but most notably the road approaching the Jarvis Brook shopping parade and railway bridge.

The Jarvis Brook railway bridge options received a mixed response. The low level of support for two way priority working controlled by signs was attributed to the fact that a trial had taken place a number of years previously that had resulted in long delays and congestion. The priority arrangement had been reversed but due to the initial disruption the scheme was not well received. However, interestingly, the same scheme but controlled with signals received a good level of support. The introduction of a new bridge received most support with the introduction of a separate pedestrian underpass slightly less popular. Lowering the road to accommodate large vehicles and to help reduce bridge strikes was not well supported.

Proposals for improvements were put to Network Rail but, at that time, there was no business case viable for them to carry out the works.

We are advised by Network Rail: ‘bridge 1029 (Jarvis Brook railway bridge) has been bashed 41 times since 1999; there are no reports of strikes to the other bridge, but as it goes over the rail line rather than under it is much less likely that a crash / strike would happen, or affect the structure.’

4.1 HGV Routes

In 2004 signage for the new HGV routes was put in place in the Crowborough area. The routes are:

For the Jarvis Brook Industrial Estate traffic is routed off the A26 via Sheep Plan, Hurtis Hill, Fermor Road, Walshes Road and Western Road to avoid the Jarvis Brook rail bridge with its height restriction of 12'9”.

For the Farningham Road Industrial Estate traffic accessing from the north from the A26 is routed via Green Lane and the B2100 whilst from the south it is routed via Church Road and B2100 (Crowborough Hill); this is to avoid Crowborough town centre and ‘Crowborough Cross’.

Figure 1 gives the area wide HGV routing for Crowborough which was presented as part of the Signing Strategy for Crowborough Town in October 1999.
5.0 The Transport Study
The County Council recognised that in order to fully assess the impacts of traffic movements in the town, and the consequences of new development coming forward through the CS, up to date traffic modelling was required. New traffic survey work undertaken in 2011 was used to produce a basic town-wide SATURN highway assignment model. The town-wide SATURN model is a comprehensive tool representing existing peak hour traffic conditions and can provide forecast traffic flows to test the area-wide consequences of proposed development allocations and different potential transport interventions. It is also the most appropriate ‘start point’ for modelling the impacts of various options for the High Street.

For the Jarvis Brook area, a more detailed VISSIM transport model has been developed. Figure 2 shows the expanded Jarvis Brook study area.
VISSIM simulates and assigns traffic along the urban road network in a more detailed manner than SATURN. The main aim of the VISSIM modelling work is to enhance understanding of the current and potential future situations in a part of the overall study area within which more complex interactions between traffic flows, parking and network capability can arise. The model considers the existing base traffic situation, including the impact of on-street parking on the operation of the local area network. The overall assessment will consider those impacts in terms of network suitability. Further work will assess the overall transport impacts of the proposed housing and employment development allocations, and will test the contributions of appropriate transport interventions in mitigating those impacts on the study area transport network.

The VISSIM modelling considers both the morning and evening peak hours (08:00-09:00 and 17:00-18:00) which have the highest levels of traffic activity. However, the overall assessment will also consider HGV flows through the day in the Jarvis Brook area, any specific safety concerns, and any options that may mitigate these effects.

The assessment will consider the impacts and consequences of the existing base case flows, future forecast year flows assuming general growth not associated with the specific Site Development Allocations, and future forecast year flows including those allocations.
6.0 2012 Base Year

6.1 Highway

Detailed traffic surveys were undertaken for the Jarvis Brook study area in September 2012 comprising:

- Junction Manual Classified Counts (MCC) at:
  - A26/Sheep Plain Lane
  - Whitehill Rd/Alice Bright Lane/Hurtis Hill
  - Walshes Road/Stone Cross
  - Hadlow Down Rd/Western Rd/Walshes Rd
  - Crowborough Hill/Rotherfield Rd/Western Rd

- Journey time surveys at A26 to Rotherfield Road.
- Parking survey along Western Road highlighting the parking locations, hours parked and what impact they are having on the journey times, and
- Additionally existing Permanent ATC Data was utilised.

The surveys were scheduled for July, but unfortunately due to emergency gas works these had to be postponed to September.

The peak AM and PM period surveyed flow diagrams used in the VISSIM model are given in Appendix A.

On both Whitehill Road and Western Road, video footage and photos were taken to further understand the interactions in both of the current traffic flow with the extensive on-street parking which occurs on those roads, and to enhance the validation of the VISSIM model,

6.2 Bus Services

At present there are 5 services providing for buses in the Jarvis Brook area, details of which are contained in table 1
Table 1

<table>
<thead>
<tr>
<th>Road Name</th>
<th>Service Nos.</th>
<th>Frequency each way in AM Peak</th>
<th>Frequency each way in PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whitehill Road</td>
<td>28, 29, 228, 229</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Western Road</td>
<td>226, 228, 229</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Walshes Road</td>
<td>226, 228, 229</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Hurtis Hill/Sheep Plain</td>
<td>28, 29, 227</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

6.3 Rail Services

Crowborough Rail Station is accessed via Farningham Road which connects to the B2100 Crowborough Hill north of Western Road. Crowborough is of the Southern Rail Service travelling north to East Croydon and London Stations, the typical peak service is two trains per hour to London Bridge, off peak it is one per hour. The preceding station is Eridge and then the following is Buxted. The station provides for 140 car parking spaces at a daily weekday charge of £4.00, and has sheltered cycle parking facilities.

7.0 The Jarvis Brook VISSIM Model

The VISSIM highway model simulates and assigns traffic along the urban road network. The VISSIM modelling considers both the morning and evening peak hours (08:00-09:00 and 17:00-18:00) which have the highest levels of traffic activity.

The road network is first coded in VISSIM. It is then simulated using the Static Routing function with traffic counts at the various junctions of the study network based on collected data. Western Road in particular has a complex parking arrangement and close study was necessary of the video footage showing how moving and parked vehicles interact in order to build up a model that best replicates real life.

Calibration and validation of the VISSIM model will be reported separately.
7.1 Forecasting

In the future, traffic flows will increase as a result of both new development and general economic growth (i.e. increases in household incomes, car ownership levels, employment rates etc). Any existing transport issues are therefore likely to increase with or without the planned further developments in the town.

For traffic with either origin or destination (or both) outside of Crowborough, standard estimates of growth to the forecast year in those external areas have been derived using TEMPRO, the national Trip End Modelling Programme. This is in accordance with the Department for Transport (DfT) Guidelines, using forecasts from TEMPRO version 6.2 and compatible National Transport Model (NTM). TEMPRO is a program that provides projections of growth over time for use in local and regional transport models. The role of TEMPRO is to act as a nationally-consistent benchmark distribution of growth in planning data and trip ends; this is shown in Table 2.

| Table 2 |
|-----------------|---------|
| TEMPRO          |        |
| SE Region 2010-2027 | AM   1.1975 |
|                 | PM     1.2035 |
|                 | Inter-peak 1.2301 |

For new development within Crowborough, the number of new trips has been based on the size of development proposed.

The Wealden Core strategy identifies that around 300 homes are expected to be provided in Crowborough over the Plan period up to 2027. These homes will be provided across three strategic allocations:

SDA8 – Pine Grove (110 homes)
SDA9 – Jarvis Brook (around 30 homes)
SDA10 – South West Crowborough – Walshes Farm (around 160 homes)

As a first step, the fundamental relationship between ‘Volume of Traffic’ and ‘Number of Houses’ was established based on a TRICS database analysis.

In TRICS, trip rates are derived based on existing housing development sites surveyed across UK. These sites vary in size and have different corresponding trip rates. In order to produce representative trip rates, it was identified that the development would represent a similar trip rate
from the one derived from the Uckfield Study given the similar geographical location and existing population, this is indicated in Table 3

**Table 3 - TRICS results**

<table>
<thead>
<tr>
<th></th>
<th>ARRIVING</th>
<th>DEPARTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM</td>
<td>0.157</td>
<td>0.456</td>
</tr>
<tr>
<td>PM</td>
<td>0.38</td>
<td>0.209</td>
</tr>
</tbody>
</table>

Overall forecasts must also include for committed development where we will need to account for the traffic generated by development proposals in Crowborough with existing permissions that anticipate being operational by the forecast year. Wealden District Council advises that during the Plan period to 2027 there are 227 houses in Crowborough with planning permission but yet to be built. However not all of these will have direct impact on the Jarvis Brook area. Given their locations, we can consider that those 227 houses will be equivalent to only 48 new homes within the Jarvis Brook study area.

Tables 4-7 gives the calculated number of new trips estimated to arise from the committed and planned new development in Crowborough.

**Table 4 - SDA 10 - Land at Walshes Farm**

<table>
<thead>
<tr>
<th></th>
<th>CAR</th>
<th>HGV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ARRIVING</td>
<td>DEPARTING</td>
</tr>
<tr>
<td>AM</td>
<td>25</td>
<td>73</td>
</tr>
<tr>
<td>PM</td>
<td>61</td>
<td>33</td>
</tr>
</tbody>
</table>

**Table 5 SDA 9 - Land at Jarvis Brook**

<table>
<thead>
<tr>
<th></th>
<th>CAR</th>
<th>HGV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ARRIVING</td>
<td>DEPARTING</td>
</tr>
<tr>
<td>AM</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>PM</td>
<td>11</td>
<td>6</td>
</tr>
</tbody>
</table>
Table 6 - SDA 8 Land at t Pine Grove

<table>
<thead>
<tr>
<th></th>
<th>CAR</th>
<th></th>
<th>HGV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ARRIVING</td>
<td>DEPARTING</td>
<td>ARRIVING</td>
</tr>
<tr>
<td>AM</td>
<td>17</td>
<td>51</td>
<td>0</td>
</tr>
<tr>
<td>PM</td>
<td>42</td>
<td>23</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 7 - Committed development in Jarvis Brook Area

<table>
<thead>
<tr>
<th></th>
<th>CAR</th>
<th></th>
<th>HGV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ARRIVING</td>
<td>DEPARTING</td>
<td>ARRIVING</td>
</tr>
<tr>
<td>AM</td>
<td>8</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>PM</td>
<td>18</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

SDA8 has been excluded from the further analysis, as it is considered that this location would have limited direct impact on the Jarvis Brook area. Appendix A indicates the distribution of the proposed developments at SDA9 and 10.

8.0 Initial Model Results

The base year VISSIM model showed that the overall network does operate with limited overall delay. However, Western Road has delay problems due to the following:

- In the morning peak there is congestion due to school parking at the junction of Hadlow Down Road. This gives delay and presents safety concerns.
- At the junction of Hadlow Down Road with Western Road there is a goods yard located to the north which presents conflicts of HGV movements.
- There is a narrow s-bend to the bridge over the rail line with the junction of Hadlow Down Road.
- It is recognised that at present both cars and HGV’s mount the northern pavements along Western Road. However, this is not modelled as it is an unsafe (and therefore illegal) manoeuvre.
- The present distribution of on-street parking has evolved over time. Although it does slow traffic speeds, with some natural give way priorities, it is relatively complicated, relying on the good will of other drivers.
Overall, congestion and delay is increased by cars waiting on the highway, delivery vehicles, turning movements in/out of parking spaces, accesses and side roads, and conflicts with HGVs.

Future year forecasts for the year to 2027 including for committed development, traffic growth and Core Strategy allocations indicate that there is an increase in traffic on the local road network. However, this growth, especially on Western Road, will serve to exacerbate existing issues. Forecast traffic increases on Western Road are shown in Tables 8 and 9.

Table 8 – Base Year Traffic Growth

<table>
<thead>
<tr>
<th>Peak Period</th>
<th>Westbound Base 2012</th>
<th>Eastbound Base 2012</th>
<th>2027 increase (TEMPRO)</th>
<th>Westbound Base 2027</th>
<th>Eastbound Base 2027</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AM Peak</strong></td>
<td>189</td>
<td>184</td>
<td>1.1975</td>
<td>226</td>
<td>220</td>
</tr>
<tr>
<td><strong>PM Peak</strong></td>
<td>208</td>
<td>252</td>
<td>1.2035</td>
<td>250</td>
<td>303</td>
</tr>
</tbody>
</table>

Table 9 – 2027 Base With Development

<table>
<thead>
<tr>
<th>Peak Period</th>
<th>Westbound Base 2027</th>
<th>Eastbound Base 2027</th>
<th>Westbound development flows</th>
<th>Eastbound development flows</th>
<th>Westbound % Increase</th>
<th>Eastbound % Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AM Peak</strong></td>
<td>226</td>
<td>220</td>
<td>13</td>
<td>33</td>
<td>6%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>PM Peak</strong></td>
<td>250</td>
<td>303</td>
<td>28</td>
<td>20</td>
<td>11%</td>
<td>7%</td>
</tr>
</tbody>
</table>

9.0 Conclusions & Way Forward

Overall, in Western Road, congestion and delay is increased by cars waiting on the highway, delivery vehicles, turning movements in/out of parking spaces, accesses and side roads, and conflicts with HGVs.

Future year forecasts for the year to 2027 including for committed development, traffic growth and for the growth within the adopted Core Strategy allocations indicate that there is an increase in traffic on the local road network.

The National Planning Policy Framework, 2012 Paragraph 32 states that:

‘Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe’.
From the modelling undertaken it is unlikely that the additional traffic impact caused by development proposed in the Core Strategy can be considered severe in transport terms. The ongoing forecast year assessment work, and the consideration of any applications submitted will need to consider whether that criterion is breached and if so what measures may possibly be delivered in conjunction with the identified new developments to sufficiently mitigate their impacts.

AS part of a package of measures, possible mitigation initiatives for Western Road could be;

- New or improved highway infrastructure schemes
- Demand management through smarter choices initiatives
- Parking and demand management
- Access to and from new and committed developments
- Influence of route choice

As part of a package of measures, potential specific longer term improvements could include:

- Improvements under and on the approaches to the B2100 Railway Bridge to allow access by HGV traffic and provision of pedestrian facilities
- Introduction of off road parking in Western Road
- Introduction of formal ‘pinch point’ and one-way working in Western Road
- Residents Parking scheme
- Commuter Parking
- Railway Bridge improvements
- Farningham Road extension
- Western Road/B2100 junction
- Improved footpaths

The County Council will continue to work with Wealden District Council and Crowborough Town Council to undertake additional modelling where necessary and in developing potential scheme options as part of a package of measures for the Western Road area. Any development contributions that may be sought to deliver these longer term options would need to be justified on the basis of the additional impacts caused by the developments themselves.
Vehicle counts are in PCU’s
Diagram 2 - PM Peak 2012 Surveyed Traffic Flows (HGV)

Vehicle counts are in PCU’s
SDA 9 - Land at Jarvis Brook

<table>
<thead>
<tr>
<th>Peak Period</th>
<th>ARRIVALS</th>
<th>DEPARTURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>(PM)</td>
<td>(11)</td>
<td>(6)</td>
</tr>
</tbody>
</table>

SDA 9 DEVELOPMENT DISTRIBUTION
AM (PM) Peak
Vehicle counts are in PCU’s.
Diagram 5 - AM Peak 2027 Predicted Traffic Flows (HGV) Development Addition

Vehicle counts are in PCU’s
Vehicle counts are in PCU’s