



Dunsfold Aerodrome
Dunsfold, Surrey

Transport Assessment Reviews

For

Joint Parish Councils

Document Control Sheet

Transport Assessment Reviews
Dunsfold Aerodrome, Dunsfold
Joint Parish Councils

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Glossary

DAL	Dunsfold Airport Limited
DfT	Department for Transport
IHT	Institute of Highways and Transportation
LMVR	Local Model Validation Report
NPPF	National Planning Policy Framework
SCC	Surrey County Council
SINTRAM	Surrey Integrated Transport Model
TAL	Traffic Advisory Leaflet
TEMPRO	Trip End Model Presentation Programme
TRICS	Trip Rate Information Computer System
WBC	Waverley Borough Council

1.0 Introduction

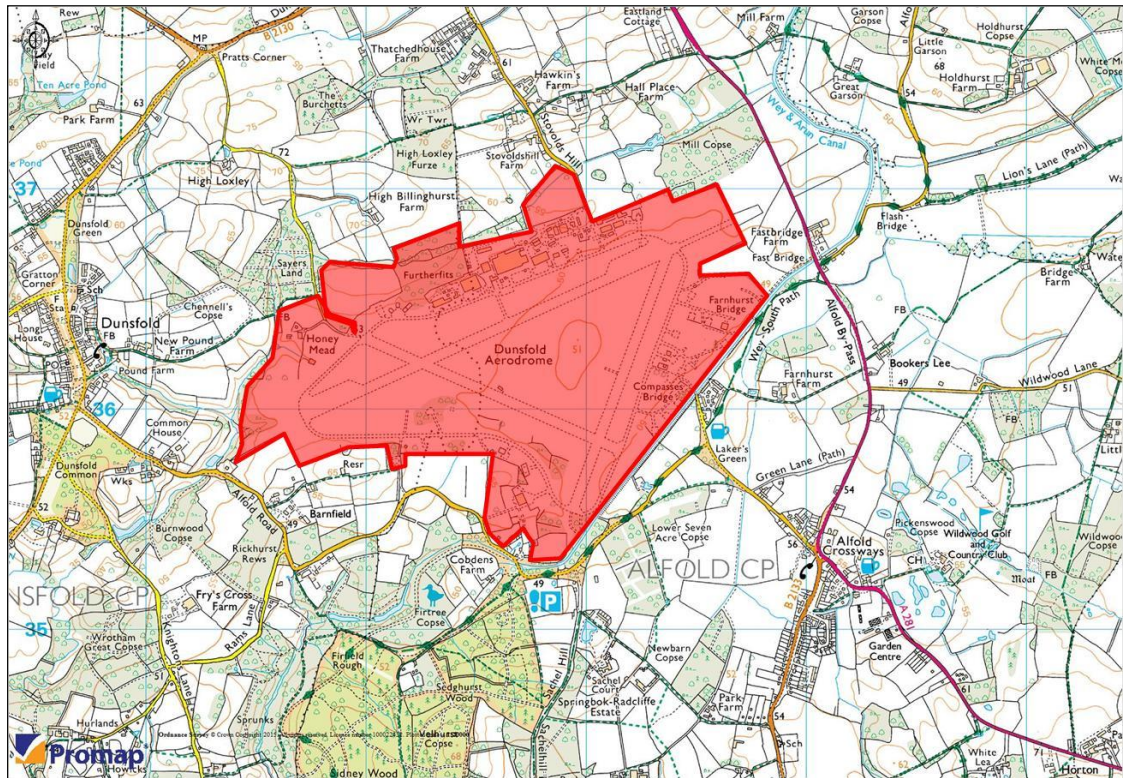
- 1.1 In 2008 Dunsfold Park submitted a hybrid planning application to Waverley Borough Council (WBC) with respect to a large scale mixed use development at Dunsfold Aerodrome. The proposals comprised a change of use for the existing employment floorspace that occupies the site together with the construction of 2,601 dwellings, a further 15,529 square metres of employment floorspace and associated community facilities.
- 1.2 The proposals were refused planning permission by WBC for a number of reasons. From a highways and transportation perspective, Surrey County Council (as local highway authority) considered that the location of the site and scale of the proposals would result in an over reliance upon the private car and therefore lead to an unacceptable impact upon the local highway network. The views of Surrey County Council (SCC) were considered by a Planning Inspector at a public inquiry in September 2009 and found to be sound. On this basis, the Secretary of State concluded that:
- "...the development would generate a considerable amount of additional road traffic and he considers that this would have a severe and unacceptable impact on an overstretched local road network and that the scheme would be unsustainable in transport terms".*
- 1.3 As part of its emerging Local Plan, WBC has commissioned SCC to undertake a high level review of the potential impacts associated with the anticipated increase in housing numbers and jobs that is expected within Waverley up to 2031. As part of this review, WBC has requested that consideration be given to allocating Dunsfold Aerodrome within the Local Plan for a mixed use scheme similar to that proposed by Dunsfold Park in 2008. In addition to this, the current owners of Dunsfold Aerodrome; Dunsfold Airport Limited (DAL), has commissioned an independent transport consultancy (Vectos) to undertake its own assessment of the impacts associated with developing a new settlement at Dunsfold Aerodrome to inform the decision making process.
- 1.4 Following the publication of these reports in Autumn 2014, the Joint Parish Councils (Alfold, Bramley, Busbridge, Chiddingfold, Dunsfold, Hascombe and Hambledon) have commissioned Motion to undertake a review of the analyses presented by SCC and Vectos to ensure they provide a sound basis upon which WBC would be able to make a decision about the acceptability of large scale development at Dunsfold Aerodrome. This Transport Appraisal has therefore been prepared to summarise the key findings of this review, and demonstrates that:
- ▶ The conclusions reached by the Secretary of State from a highways and transportation perspective are still considered to be sound when assessed against the key principles of the National Planning Policy Framework (NPPF);
 - ▶ The strategic model that has formed the basis of the analyses undertaken by SCC to date is subject to limitations that mean the results published to date should be treated with caution by WBC; and,
 - ▶ Insufficient evidence has been presented at this stage by DAL to overcome the conclusions reached by the Secretary of State in 2009 from a transport sustainability and highway impact perspective.
- 1.5 In light of the above it is considered that WBC should request additional information be provided by SCC and DAL. Of particular importance will be to ensure that the measures proposed to enhance access by sustainable transport are deliverable and sufficiently robust to reduce reliance upon the private car. To date, the information provided by DAL is largely the same as that proposed in 2008 and ultimately found to unacceptable.
- 1.6 As the potential highway impact of developing a large mixed use scheme at Dunsfold Aerodrome is intrinsically linked to the success of the sustainable transport measures proposed by DAL, further evidence is required to provide WBC with the comfort that increases in traffic will not have a severe impact upon a highway network that is already subject to periods of delay. On this basis, further consideration is also required to ensure that the proposed highway improvement schemes identified by Vectos are effective.
- 1.7 Following this introduction, this report is split into four sections as follows:

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- ▶ Section 2 considers the existing site use, provides an overview of the site accessibility and its planning history, as well as a review of the decision reached by the Secretary of State having regard to the planning tests set out in the NPPF;
 - ▶ Section 3 contains a review of the high level highway impact assessment undertaken by SCC on behalf of WBC;
 - ▶ Section 4 considers the evidence presented to date by Vectos on behalf of DAL; and,
 - ▶ Section 5 summarises the key findings and conclusions of the report.

2.0 Dunsfold Aerodrome: Baseline Conditions and Planning History

Site Location

- 2.1 Dunsfold Aerodrome, which covers a total area of circa 248 hectares, is located to the west of the A281 (Alfold By-pass) approximately seven kilometres south-east of Cranleigh village centre. A plan showing the location of the site in relation to the local highway network is provided below.

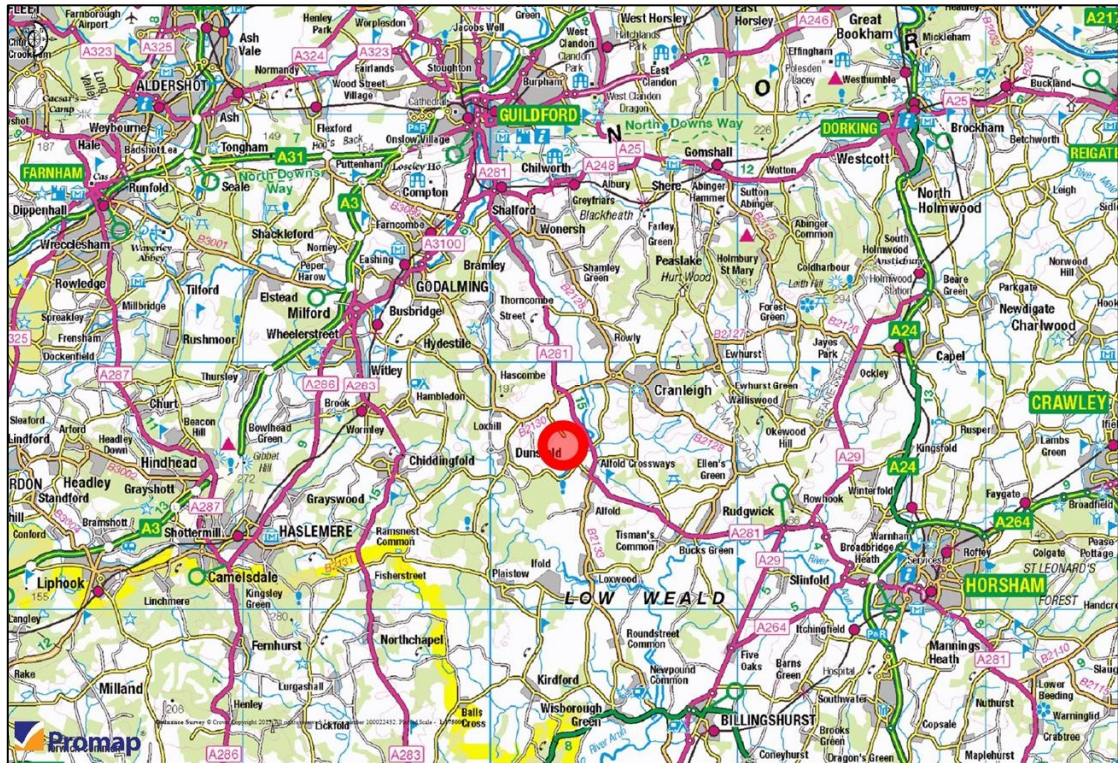


Site location

- 2.2 The local area is generally characterised by open countryside within an area designated as "Countryside beyond the Green Belt" by Waverley Borough Council. However, the site has been in aviation use since the Second World War and as such benefits from three runways, areas of hardstanding, perimeter tracks and circa 44,721 square metres of industrial buildings. The site has existing vehicular access points on to Stovolds Hill and Compasses Bridge. The Stovolds Hill provides connectivity to the B2130 and A281 to the north, with the access on Compasses Bridge providing connections to the A281 south of Alfold Crossways.

Local Highway Network

- 2.3 The local highway network is focused around Alfold By-Pass, which is a single carriageway road that is subject to a 40 miles per hour speed limit adjacent to the site. Alfold By-Pass provides connections to Guildford in the north, from where it is possible to access the trunk road network via the A3, and Horsham to the south. In addition to these links, principal settlements of Cranleigh, Farnham, Godalming and Haslemere are accessible via connections that Alfold By-Pass makes with other key roads, including the B2130, and the A283 and A3100 that are accessible via a network of rural lanes. The location of the site in relation to the regional highway network can be seen below.



Regional highway network

Sustainable Transport Options

- 2.4 As is to be expected given its rural location, the site is not well situated with respect to sustainable transport networks. For example, both accesses to Dunsfold Park are narrow country lanes that do not benefit from pedestrian footways or street lighting. There are also no dedicated cycle facilities located in the immediate vicinity of the site, whilst the nearest bus stops and train station are located outside the maximum walk distances identified by the Institute of Highways and Transportation (i.e. 400 metres and 800 metres respectively). Notwithstanding this, the services that currently serve the nearest bus stops located on Dunsfold Road operate on a two hourly frequency and do not provide any connections with the nearest railway stations (i.e. Godalming, Haslemere, Milford and Whitley), which are located at least eight kilometres from the site.
- 2.5 The 2011 Census has been interrogated in order to assess what impact the relatively poor sustainable transport networks have upon travel behaviour for work based trips. For the purposes of this assessment, reference has been made to the the existing settlements of Alfold Crossways and Dunsfold. Details of the data extracted from the 2011 Census is provided at [Appendix A](#), and summarised at Table 2.1.

Mode	Output Layers	Local Authority
	E00157364, E00157365, E00157402, E00157403	Waverley
Public Transport	9.6%	14.7%
• Rail	7.7%	12.8%
• Bus	1.9%	1.9%
Car/van driver	77.1%	67.3%
Car/van passenger	5%	4.2%
Taxi	0%	0.2%
Motorcycle	0.9%	0.8%
Pedal Cycle	1%	1.7%
On foot	5.8%	10.3%
Other	0.7%	0.7%
TOTAL	100%	100%

Table 2.1 – 2011 Census Data

- 2.6 Table 2.1 indicates that circa 77% of residents within the E00157364, E00157365, E00157402, and E00157403 Output Areas travel to work by car. It is therefore evident that the relatively poor sustainable transport options outlined above do not provide real alternatives to the private car. Indeed, it is considered that the proportion of existing residents that currently travel by car are likely to be closer to 85% given that the 8% of people that travel by train are likely to access the nearest railway station (Witley) by car. As such, it is considered that the site is located in one of the less sustainable locations of the borough. This is exemplified by car use for the E00157364, E00157365, E00157402, and E00157403 Output Areas being some 14% higher than the borough average.

Planning History

- 2.7 In 2008, Dunsfold Park submitted a hybrid planning application to WBC with respect to a new settlement on the site. The proposals comprised a detailed application for the change of use of the existing 36,692 square metres of employment floorspace, together with an outline application for the construction of 2,601 residential units, a further 15,539 square metres of employment floor space, a primary school and village centre (Ref: WA/2008/0788).
- 2.8 As part of the proposed development, Dunsfold Park identified a package of highway and sustainable transport mitigation measures. These included:

Highway Mitigation Measures

- ▶ Improvements to the traffic signals at Nanhust Crossroads;
- ▶ The signalisation of the A281/Broadford Road junction in Shalford; and,
- ▶ Localised widening on the approaches to the A281/Kings Road junction in Shalford.

Sustainable Transport Strategy

- ▶ A restrained parking policy;
- ▶ A cordon charge within the development;
- ▶ A high quality pedestrian network and facilities;
- ▶ A high quality cycle network and facilities;
- ▶ A car club;
- ▶ A car share scheme;
- ▶ Community Electric Vehicles;

- ▶ Smart Technology;
 - ▶ Individualised Marketing;
 - ▶ A high quality bus scheme; and,
 - ▶ An innovative and robust Site Travel Plan.
- 2.9 The application made by Dunsfold Park was refused by WBC for a number of reasons, including several highways and transportation related matters. In short, it was the view of WBC, following advice from SCC, that due to the location of the site the proposed development would be car dependent. Moreover, as a result of their size the proposals would thus lead to an unacceptable increase in traffic that would have a detrimental effect from a highway capacity and residential amenity perspective. Following a public inquiry in 2009, the decision reached by WBC was found to be sound by the appeal inspector; a view that was subsequently shared by the Secretary of State.
- 2.10 With respect to highways and transport, it is noteworthy that the Secretary of State concluded in his decision notice dated 24th September 2009 that:
- "...in so far as the existing situation is concerned, the site is not in a sustainable location and little can be done to improve the existing infrastructure beyond minor alterations to road junctions".*
- 2.11 Notwithstanding this, it is accepted that the Secretary of State agreed with the Inspector that the design of the new settlement had incorporated a number of measures to minimise the number of external vehicle trips. However, it is also important to acknowledge that the Secretary of State concluded:
- "...the additional vehicular movements resulting from the development would put **severe** [Motion emphasis] and unacceptable pressure on an overstretched road network in which there is only limited scope for improvement".*
- 2.12 Likewise, the Secretary of State agreed with the Inspector that:
- "Cranleigh is too far away for access by either walking or cycling, and...there is some doubt as to whether some of the [suggested] improvements could be achieved".*
- 2.13 In reaching his decision, the Inspector had regard to evidence presented by SCC with respect to the proposals to upgrade and downgrade current public rights of way. As this would be reliant upon further statutory processes outside of the Town and Country Planning Act, there can be no guarantee that the planned improvements to pedestrian and cycle infrastructure could be delivered. As a result the sustainability issues associated with the site would be compounded, leading to a greater reliance upon the private car.
- 2.14 On this basis, the Secretary of State ultimately concluded that:
- 2.15 *" ...the development would generate a considerable amount of additional road traffic and he considers that this would have a **severe and unacceptable impact** [Motion emphasis] on an overstretched local road network and that the scheme would be **unsustainable in transport terms** [Motion emphasis]".*

Transport Planning Context

- 2.16 When considering the above, it is important to note that the statutory development plan at the time of the appeal has now been superseded by the NPPF. To this end, a review has been undertaken in order to see if the current policy tests that should be taken into consideration when allocating a site would materially change the conclusions reached by the Secretary of State in 2009.
- 2.17 The NPPF sets out a presumption in favour of sustainable development that recognises the importance of transport policies in facilitating sustainable development, and that planning decisions should have regard to local circumstances. In this regard, promoting sustainable transport forms an important element of the NPPF and states at paragraph 29 that:

"The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel. However, the Government recognises that different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas."

2.18 Similarly, paragraph 30 states that:

"In preparing Local Plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport."

2.19 Moreover, paragraph 31 recommends:

"Local authorities should work with neighbouring authorities and transport providers to develop strategies for the provision of viable infrastructure necessary to support sustainable development..."

2.20 Whilst, paragraph 34 notes:

"Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised. However this needs to take account of policies set out elsewhere in this Framework, particularly in rural areas."

2.21 In this regard, paragraph 35 requires developments (where practical to do so) to be located and designed to:

"...give priority to pedestrian and cycle movements, and have access to high quality public transport facilities..."

2.22 On a similar note, paragraphs 37 and 38 recognise the importance of ensuring large scale developments incorporate a mix of uses that facilitate day-to-day activities to be completed on-site. In this regard, it is important to note that paragraph 36 recognises the importance of operating a robust Travel Plan.

2.23 Finally, paragraph 32 requires all development to provide "...safe and suitable access to the site can be achieved for all people..." and indicates "...Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe."

2.24 It is clear from the above that all developments should provide people with safe and suitable access to a range of transport modes that minimise reliance upon the private car. Given the uncertainty about the deliverability of the improvements that were discussed at the Inquiry for pedestrians, cyclists and public transport users, it is considered that the conclusion reached by the Secretary of State with respect to the sustainability of large scale development at Dunsfold remains valid.

2.25 It is accepted that Dunsfold Park could argue the previous proposals accorded with paragraphs 37 and 38 of the NPPF given that they comprised a mix of uses. However, it is important to read these paragraphs in conjunction with paragraph 17 of the NPPF, which states proposed developments should:

"...actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable..."

2.26 In this regard, it is considered that the uncertainty about the deliverability of the sustainable transport measures would inevitably result in reliance upon the private car. This conclusion has been reached having regard to the Census data for the existing residents of Alfold Crossways and Dunsfold and has regard to the Secretary of State's observations that the site is located in an unsustainable location and that little can be done to improve accessibility by non-car modes.

2.27 To this end, the conclusion that the proposed development would have resulted in a considerable increase in traffic also remains valid. It is therefore considered reasonable to assume the Secretary of State would have still concluded that the proposals would result in a severe impact, based upon the evidence that was considered at the Inquiry, if the NPPF planning tests for new development are fully considered.

2.28 Notwithstanding the above, it is accepted that the Secretary of State agreed with the appeal Inspector that:

“Despite its disadvantageous location relative to the surrounding transport infrastructure, the appeal site has many advantages. When seen in the context of other options the appeal proposals may well prove to be the best solution for meeting the South East Plan housing requirement. However, those other options have yet to be explored. The South East Plan had not even been approved at the time of the Inquiry and the Council does not as yet have an adopted Core Strategy. The superiority of the appeal proposals cannot be assumed. A decision to allow the Eco-Village to proceed at this stage, prior to the formulation of the LDF, would be premature and would effectively pre-empt the proper consideration of alternatives as part of the development planning process”.

2.29 In recognition of this, WBC and DAL have commissioned SCC and Vectos to undertake transport studies that seek to inform WBC’s emerging Local Plan. The following sections of this report consider the evidence presented in these reports, and highlights potential limitations that should be addressed before any decision about the acceptability of large scale development at Dunsfold can be made.

3.0 Surrey County Council Strategic Transport Assessment Review

Overview

- 3.1 SCC has undertaken several reviews of the potential impact of anticipated growth in house and job numbers within Waverley using the Surrey Integrated Transport Model (SINTRAM). The following text considers the latest iteration, which has been prepared to help inform WBC and its emerging Local Plan.

Surrey's Strategic Transport Model – SINTRAM

- 3.2 SINTRAM has been developed by SCC to evaluate the impact of strategic development across the County. To this end, it includes all motorways, A and B classified roads, together with most (but not all) local roads. It is capable of assessing link capacity, junction delays and journey times so that a comparison can be drawn about potential highway impacts associated with various development scenarios in the traditional morning and evening peak travel periods.
- 3.3 SINTRAM also includes the geometric characteristics of those junctions where delays can have an effect upon route choice. In this regard, it is also able to replicate the effects that increased demand at sensitive locations is likely to have upon journey times and thus predicts changes in travel behaviour. Indeed, in the "Core Strategy Transport Assessment Report" it prepared for WBC in 2012 SCC notes at page 7 that:

"It can also indicate how traffic diverts away from busy routes (i.e. re-distribution effects), where traffic is slowed because of excessive demand, and adds to flows on secondary routes that may be less suitable and hence more sensitive to changes in flow..."

- 3.4 However, it should be noted that SINTRAM was developed as a 'tool' used to inform strategic decisions that are made by local planning authorities with respect to potential site allocations. The results it generates do not therefore take account of any potential mitigation measures that may be required to deliver specific allocations at the local level, although it does take into account committed highway schemes of strategic importance. On this basis, its findings are not intended to provide a definitive conclusion about the overall acceptability of potential development sites. Indeed, in the "Strategic Transport Assessment Report" prepared by SCC on behalf of WBC in 2014 it is stated at paragraph 5.1.10 that:

"This study was undertaken at a strategic scale and consequently not all impacts of developments have been identified. However, developments of, and above, a certain quantum will require individual transport assessments to be commissioned allowing finer details regarding impacts to be analysed at a refined spatial scale".

- 3.5 In this regard, it is clear that the results contained therein would need to be supported by further assessments that consider localised issues in more detail.

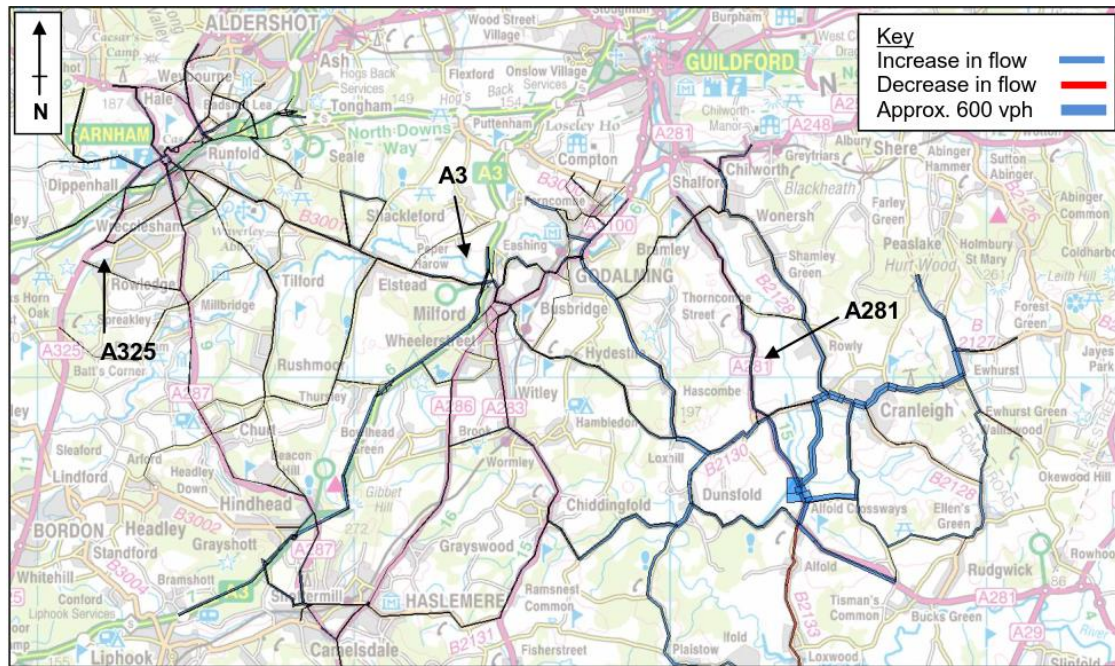
Waverley Strategic Transport Assessments

- 3.6 It is understood that SCC was commissioned in 2010 to evaluate the impact of WBC's emerging Core Strategy. This assessment, which was undertaken using SINTRAM, assumed that the focus of future growth would be within the four principal settlements of Cranleigh, Farnham, Godalming and Haslemere. Based on the outputs generated by SINTRAM it was established that the increases in traffic associated with future growth, which had regard to South East Plan housing targets, would place additional pressure on roads within and around these settlements.

- 3.7 SCC has since updated its assessment in 2012, and more recently in 2014, to reflect anticipated changes in future growth projections. A summary of the scenarios tested in 2014 is shown below:

- ▶ Scenario 1 – All proposed development forecast by TEMPRO, sites in WBC's Strategic Housing Land Availability Assessment (SHLAA) and windfall estimates, 'green' Greenfield sites, 'amber' Greenfield sites (in Bramley, Chiddingfold and Elstead) and low growth in villages;

- ▶ Scenario 2 – All sites in scenario 1 together with 1,800 dwellings and associated commercial development at Dunsfold and medium growth in villages;
 - ▶ Scenario 3 – All sites in scenario 1 together with 'amber' Greenfield sites (in Cranleigh, Farnham, Chiddingfold and Haslemere) as well as medium growth in villages; and,
 - ▶ Scenario 4 – All sites in scenario 1 together with 3,600 dwellings and associated commercial development at Dunsfold and medium growth in villages.
- 3.8 The outcome of the latest SINTRAM assessment, which is focused upon the morning peak period only, largely confirms the results generated in 2010; namely, the anticipated growth in houses and jobs is unlikely to have an adverse effect upon the local highway network within Waverley. However, clear distinctions are made between locations and the different scenarios that have been considered to date. For example:
- ▶ Scenario 1: The focus of impacts would be in Farnham, which reflects the fact the majority of planned development would be located in and around this settlement;
 - ▶ Scenario 2: This scenario would be subject to the same impacts as Scenario 1, but with the largest traffic impacts being experienced in the vicinity of Dunsfold Aerodrome;
 - ▶ Scenario 3: The overall impact of planned growth would be similar to that associated with Scenario 2, but would be more evenly distributed across the local highway network; and,
 - ▶ Scenario 4: The greatest impacts will be generated by this scenario. As with Scenario 2 they will be focused around Dunsfold, but will be of a greater magnitude and affect a larger area.
- 3.9 When considering the above it is important to note that paragraph 3.1.3 of the Department for Transport guidance document entitled '*Transport Appraisal Guidance Unit M3.1, Highway Assignment Modelling*' states:
- "It is important to bear in mind that the role of calibration is to develop a model that is fit for purpose and does not produce unduly misleading or biased results that are material in the context of the schemes or policies being tested."*
- 3.10 Having reviewed the Local Model Validation Report (LMVR) prepared by SCC (see **Appendix B**) it is evident that the model is generally operating within accepted thresholds at the borough wide level. **However, at the local level the model is subject to limitations that are likely to underestimate the impact of traffic associated with Scenarios 2 and 4**, which specifically consider large scale development at the Dunsfold Aerodrome site. For example, it is evident that the modelled two-way flows (i.e. circa 140) along the B2130 (Elmbridge Road) are some 60% to 70% lower than was recorded in 2009 (i.e. circa 425). This is a common problem associated with strategic models whereby the accuracy of the modelling becomes less accurate in peripheral locations, and as such goes some way to explaining why SCC has noted further assessments should be taken at the local level.
- 3.11 Notwithstanding this, it should also be acknowledged that the base year for the SINTRAM model is 2009. To this end, the traffic surveys that form the basis of the latest assessment exceed the three year period that is generally considered to be an acceptable timeframe for surveys to remain valid. Having reviewed several applications that have recently been submitted with respect to proposed developments within Cranleigh, it is evident that two-way traffic flows along Elmbridge Road are currently in the order of 650 movements in the morning peak period.
- 3.12 The apparent discrepancies associated with Elmbridge Road are considered to represent a significant limitation of the model given that strategic models will redistribute traffic to routes that are likely to benefit from fewer delays. By misrepresenting the current baseline position, SINTRAM underestimates the potential impact of Scenarios 2 and 4 upon the A281 corridor and the country roads that provide connectivity to the principal towns located to the west of the site). Indeed, the vast majority of traffic associated with development at Dunsfold Aerodrome has been assigned through Cranleigh contrary to current journey to work statistics for the local area (see Section 4 for details).



SCC Strategic Transport Assessment Figure 4.4

- 3.13 Whilst the distribution presented above does not accord with current travel patterns, it is useful in so much as it suggests delays along the A281 are of a sufficient magnitude to encourage a large proportion of vehicles to seek an alternative route. **In this regard, it is considered reasonable to assume that the current delays associated with the A281 are likely to be a limiting factor in the delivery of large scale development at Dunsfold Aerodrome.** This is consistent with the findings of the Secretary of State with respect to the 2008 application, and is to be expected given that Table 4.10 of the SCC report shows the A281 to be operating well over capacity in 2031 under Scenario 4.
- 3.14 When considering the capacity results shown at Table 4.10, it is noteworthy that the trip rates contained within SINTRAM for the Dunsfold site appear to underestimate the levels of traffic that could be generated by large scale development at this site. Unfortunately we have not been able to scrutinise the approach taken by SCC as details of the trip rates that have been used to date are not provided. However, the following table summarises the levels of trips that have been assessed by SCC together with similar data identified by Vectos on behalf of DAL and Motion. Please note that the data related to Vectos and Motion does not include any allowances being made for internalisation of trips. Further details with respect to traffic generation are provided at Section 4.

Approach	Scenario 2	Scenario 4
SCC Strategic Transport Assessment	953	1,830
Vectos Preliminary Transport Assessment	1,026	2,073
Motion Review	1,184	2,385

Table 3.1 – Two-way Traffic Generation Summary

- 3.15 Notwithstanding the above, it is noteworthy that Figure 4.4 of the SCC report does not show any traffic using the rural lanes that link Shalford with Dunsfold. Whilst it is accepted that it would not be feasible to include all roads within the local area within SINTRAM, they do provide effective viable alternative to the A281 when travelling to and from Guildford. It is therefore considered that appropriate regard should be made to the potential impact that Scenarios 2 and 4 of the current assessment have upon these roads, as there is likely to be limited scope to mitigate any material increases in traffic on these routes. This is particularly evident given the quote taken from 2012 Core Strategy Transport Assessment, and the fact that Table 4.1 of the SCC report suggests the B classified and minor roads in the model will be subject to the following increases:

Statistic (For the Study Area)	Road Type	Scenario 2	Scenario 4
Vehicle Kilometres	B Road	17%	21%
	Minor Road	20%	30%
Vehicle Hours	B Road	19%	23%
	Minor Road	20%	30%

Table 3.2 – Network Summary Statistics Extract

- 3.16 Unfortunately the way that SCC has presented its modelling results in the 2014 report means it is not possible to provide any commentary about specific impacts along the B2130 (and surrounding roads) that provide routes to the higher order settlements of Godalming, Guildford and Haslemere. To this end, it would be beneficial for the summary tables to be expanded beyond the top 10 links and junctions so that appropriate consideration can be given to the impacts outlined above with respect to the B classified and minor roads in SINTRAM. There would also be merit in expanding the SINTRAM study area to include all minor roads that provide an alternative link to the higher order settlements. Without this information it is considered that any decision on the suitability of large scale development at Dunsfold Aerodrome would be premature.

Summary

- 3.17 **On the basis of the above, it is considered that insufficient information has been provided to date to enable a reasoned decision to be made about the acceptability of including the Dunsfold site within the emerging WBC Local Plan.** The limitations that have been identified with respect to SINTRAM should be investigated, with the analyses undertaken to date re-run and to include an assessment of the evening peak period. When re-running the analyses, it is considered that the baseline survey data should be updated to reflect current conditions and be expanded to include other minor roads that provide viable alternatives to the A281 when travelling to/from Guildford. Similarly, the trip rates that are contained within SINTRAM should also be reconsidered given that they appear to underestimate the levels of traffic that are likely to be generated by a large mixed use scheme at Dunsfold. We would welcome the opportunity to work with SCC when it undertakes this work to ensure that the potential impact of the proposals upon the Joint Parishes is appropriately considered.

4.0 Vectos Preliminary Transport Assessment Review

Overview

- 4.1 In order to inform the decision making process, DAL has commissioned Vectos to assess the potential impact of allocating Dunsfold Aerodrome in WBC's emerging Local Plan. As part of its assessment Vectos has developed a Paramics model to test the impact of a range of potential scenarios upon the A281 corridor, and where appropriate has identified potential mitigation measures. Vectos has also given consideration to how the accessibility of the site can be enhanced, with its findings presented in a Preliminary Transport Assessment. The following text considers the information presented therein.

Scenario Testing

- 4.2 For the purposes of its assessment, Vectos has considered three different scenarios that comprise the following:

Land Use	Scenario 1	Scenario 2	Scenario 3
Residential Uses	1,800	2,600	3,400
Retained Existing Uses	36,692	36,692	36,692
Office (sqm)	2,200	9,440	12,000
Industrial (sqm)	4,500	6,099	18,000
Storage and Distribution (sqm)	7,624	7,624	7,624
Retail (sqm)	600	1,035	1,500
Professional Services (sqm)	0	0	300
Food and Drink (sqm)	270	460	850
Hotel (bedrooms)	100	100	100
Day Nursery (sqm)	500	500	500
Primary Education (pupils)	420	630	840
Medical Centre (sqm)	150	210	270
Community Facilities (sqm)	466	676	880
Museum (sqm)	4,370	4,370	4,370
Church (sqm)	649	649	649
Sports Facilities (sqm)	2,185	2,185	2,185
Existing education uses (pupils)	60	60	60

Table 4.1 – Development Scenarios

Trip Generation

- 4.3 When assessing the impact of a proposed development upon the local highway network, it is standard practice to have regard to the TRICS database and/or first principle calculations that take into account anticipated activity associated with a use. Having reviewed the evidence presented by Vectos to date, it is considered the approach taken with respect to predicting traffic flows is generally sound. However, there are some areas that potentially underestimate the levels of traffic that are likely to be generated by the various scenarios. A summary of our concerns is set out below.

Residential Vehicle Trips

- 4.4 In order to establish vehicle trips associated with the residential uses, Vectos has extracted person trip rates from the TRICS database and then applied a factor based upon data collected during the 2011 Census for the Chiddingfold and Dunsfold ward. Whilst this approach is consistent with industry best practice, the factor that Vectos has applied has underestimated the proportion of car trips that are currently made by residents in this ward. This is due to the mode split calculations presented at Table 3.6 of its report including working from home, which is not included in the data that is referred to by TRICS when establishing person trip rates.

4.5 The analyses undertaken by Vectos have therefore been revised to exclude the working from home trips. As is shown at **Appendix C**, this results in the number of car drivers increasing from 59% to 68%. The effects that this has upon the residential trip rates that have formed the basis of the detailed junction modelling presented at Section 7 of the Vectos report are shown at Table 4.2.

Time Period	Vectos Approach			Motion Approach		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Weekday Morning (08:00–09:00)	0.084	0.404	0.488	0.097	0.465	0.562
Weekday Evening (17:00–18:00)	0.286	0.145	0.431	0.330	0.167	0.497

Table 4.2 – Residential Trip Rate Comparison (per unit)

4.6 **Based on the information presented at Table 4.2, it is evident that the vehicle trip rates assessed by Vectos are some 14% lower than may be reasonably expected.** It is therefore considered that the junction modelling results presented by Vectos should be viewed with caution. This is particularly evident given that it has been shown at Section 2 residents of Alfold Crossways and Dunsfold have an even higher reliance upon the private car for work based trips than the wider Chiddingfold and Dunsfold ward, with up to 85% of all trips currently completed by car. Indeed, the site is currently located in one of the least accessible areas of the Borough and thus, contrary to Vectos’ view, more car dependent than higher order settlements.

Employment Floor Space Trip Rates

4.7 Vectos has also established trip rates for the various employment uses having regard to the TRICS database, albeit for this the data extracted relates to vehicles only. The reason for this is stated as being a relatively low number of multi-modal sites within TRICS. This is considered a reasonable approach, as are the search parameters that have been referred to. **However, we contend that the trip rates that have been established for the B2 and B8 uses underestimate the levels of trips that are likely to be attracted by these uses.**

4.8 Whilst we agree with the removal of sites that are located in large conurbations, it is not clear why TRICS site WS-02-C-02 has not been included. Having entered the search parameters stated at paragraph 3.16 of the Vectos report it would suggest that this site should have been taken into account. This is particularly evident given that the site is located in a similarly rural area, as shown below.



TRICS Site WS-02-C-02 Location

- 4.9 With this in mind we have re-run the TRICS analyses presented by Vectos to include this site to establish what impact this would have upon trip rates. As is shown at **Appendix D** and Table 4.3, the trip rate increases considerably. These differences compound the limitations identified with respect to the residential trip rates identified above and raises further questions about the validity of the modelling results presented at Section 7 of the Vectos report.

Time Period	Vectos Approach			Motion Approach		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Weekday Morning (08:00–09:00)	0.297	0.077	0.374	0.552	0.073	0.625
Weekday Evening (17:00–18:00)	0.047	0.237	0.284	0.048	0.448	0.496

Table 4.3 – Industrial Trip Rate Comparisons (per 100 sqm)

- 4.10 The same is also true of the approach that has been taken by Vectos with respect to the B8 uses. To date Vectos has focused its analyses upon trip rates associated with 'commercial warehousing'. However, it is considered reasonable to assume that this element of the employment floor space could also be occupied by other businesses that constitute a B8 use. Moreover, it is not clear why site BD-02-F-01 has been included in the trip rates referred to by Vectos given that it is not consistent with the search parameters set out at paragraph 3.16 of its report.
- 4.11 To this end, it is considered appropriate to establish weighted average trip rates for each of the B8 land uses that are contained within TRICS (i.e. commercial warehousing, self-storage, and parcel distribution centres). To ensure consistency with the approach taken by Vectos, the search parameters outlined at paragraph 3.16 of its report have been used where possible to do so. The results of the alternative TRICS assessment are attached at **Appendix E** of this report along with separate calculations that have established the weighted average trip rates presented at Table 4.4.

Time Period	Vectos Approach			Motion Approach		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Weekday Morning (08:00–09:00)	0.090	0.094	0.184	0.170	0.186	0.356
Weekday Evening (17:00–18:00)	0.064	0.125	0.189	0.178	0.212	0.390

Table 4.4 – B8 Land Use Trip Rate Comparison

- 4.12 Table 4.4 also shows the trip rates that have formed the basis of the Vectos report are likely to have significantly underestimated the levels of traffic that could reasonably be attracted to this aspect of the employment floorspace. This further brings into question the analyses that have been presented to date.

Trip Internalisation and Assessment Data

- 4.13 As is common with large mixed use schemes such as that proposed, it has been assumed that a proportion of trips generated by the site will remain within the development and thus not have an effect upon the wider highway network. At this stage, Vectos has assumed that 10% of trips will not leave the site and has made reference to research published by Cervero in justifying this approach. For example, it is considered that the development will deliver a housing to jobs ratio of circa 0.77, which is consistent with thresholds that are associated with low car dependency and higher than average self-containment.

- 4.14 It is considered that applying a 10% reduction for the purposes of an initial assessment is reasonable. However, it should be noted that no details have been provided that show what proportion of the jobs associated with the new settlement will comprise those associated with the 'retained' employment uses. To this end, we will look forward to having the opportunity to review the technical note that Vectos has indicated will be prepared at a later date. Without prejudice to this report, it would seem illogical to assume that a large proportion of the people that already work at the site will move to the new settlement just because there will be new homes provided. The proximity of work is only one factor amongst many that determine where people live.
- 4.15 Notwithstanding this, it should be noted that the observations made above with respect to trip generation will have an effect upon the trips that Vectos has referred to when undertaking its highway impact analyses. To this end, the calculations undertaken by Vectos have been updated having regard to the alternative trip rates that have been identified. Copies of the calculations are provided at **Appendix F** for completeness, with a summary of the impact that this has upon the assessment flows provided at Tables 4.5 and 4.6. It should be noted that the following information takes into account the 10% reduction that Vectos has assumed with respect to the internalisation of trips.

	Scenario 1	Scenario 2	Scenario 3
Vectos Approach	931	1427	1876
Motion Approach	1073	1626	2157
Net Difference	-142	-199	-281

Table 4.5 – Assessment Data Comparison (AM Peak)

	Scenario 1	Scenario 2	Scenario 3
Vectos Approach	826	1249	1637
Motion Approach	955	1429	1887
Net Difference	-129	-180	-250

Table 4.6 – Assessment Data Comparison (PM Peak)

- 4.16 The information presented above shows the trips assessed by Vectos to date are likely to have underestimated traffic demand by between circa 130 and 280 vehicles in the assessment periods. As these differences equate to between two and five additional vehicles per minute, **it is considered that the analyses presented at Section 7 of the Vectos report will significantly underestimate the impact of the proposals. This modelling should therefore be revisited before any decision about the suitability of this site can be made.**

Traffic Distribution

- 4.17 When establishing the distribution of development traffic it is best practice to have regard to analyses of census data, gravity models or existing traffic flows. Having undertaken our own review of 2011 Census data, it is considered that the distribution profiles set out at Tables 4.1 and 4.2 of the Vectos report provide a reasonable basis upon which to evaluate the impact of the three development scenarios.
- 4.18 However, it would have been helpful if figures could have been provided showing how traffic is anticipated to be distributed across the highway network. This is particularly evident when considering the approach that has been taken with respect to how trips to and from the west are likely to be distributed, given that the roads that link the site with Farnham, Godalming, Haslemere and Milford are generally lower class roads that pass through sensitive village locations.
- 4.19 It is noted that Vectos accepts it will need to refine its approach to education trips. This is welcomed given the current analyses assumes Glebelands in Cranleigh will cater for the majority of education trips, whereas it does not offer any post GCSE courses. As such, it is reasonable to assume at this stage there would be an increase in education trips to and from Godalming College to the west.

Committed Developments

- 4.20 When evaluating the impact of a potential new development, it is best practice to consider the cumulative impacts of existing proposals that benefit from a planning consent. Unlike the assessment undertaken by SCC, it is not clear what consideration Vectos has made to committed developments that are likely to use the local highway network in the immediate vicinity of the site. We would therefore expect WBC to request clarification on this matter with the Paramics modelling undertaken by Vectos to date to be updated accordingly.

Sustainable Transport Opportunities – Hard Measures

- 4.21 It is noted that DAL remain committed to incorporating many of the measures that are intended to encourage less reliance upon the private car. This is important given the conclusion reached by the Secretary of State in 2009 that the site is located in an unsuitable location. However, it is considered that the information presented in the Vectos report is not sufficiently detailed to overcome the conclusion that there was little that could be done to improve this situation. For example, the measures proposed to enhance existing walking and cycling infrastructure would involve making alterations to the public rights of way networks and thus be predicated upon statutory processes outside of the Town and Country Planning Act. To this end, there can be no certainty that these measures can be delivered.
- 4.22 Notwithstanding this, it is considered that the suggestion that cycling levels at the Dunsfold site could be similar to that achieved in South Cambridgeshire is misleading. Whilst it is noted that Vectos has not undertaken an analysis of local employment areas for Dunsfold or South Cambridge, it is significant that the proximity between settlements is far greater around Dunsfold than those within the district of South Cambridgeshire. In addition to this, it is also considered noteworthy that the topography around Dunsfold is more undulating than South Cambridgeshire, which is generally characterised by low lying land that is more conducive to cycling. Indeed, it is important to acknowledge guidance published by the Institute of Highways and Transportation (IHT) in 1998 (*Cycle Audit and Review*) which lists gentle gradients as a key requirement for cyclists.
- 4.23 As the proposed bus service, which is identified by Vectos as being one of the key elements of the previous sustainable transport strategy, is reliant upon making use of the Downs Link this would be subject to the same uncertainty. Notwithstanding this, the information presented to date does not provide sufficient information to justify if such a service would be financially viable. As a guide, a similar guided busway that operates along a 25 kilometre stretch of disused railway line in Cambridge cost circa £150 million and was heavily reliant upon public subsidy, with central government providing circa £90 million.
- 4.24 As three of the routes proposed by DAL cover circa 10 kilometres it is not considered unreasonable to assume that the costs associated with delivering this may be in the order of circa £60 million. Greater certainty should therefore be provided that this service can be delivered by DAL given that guidance published by the IHT in 1999 (*Planning for Public Transport in Developments*) considers:
- “It is important to provide a satisfactory public transport service immediately a new development comes into use... In the case of housing this can get occupiers into the habit of using buses and prevent them purchasing second cars”* (paragraph 2.23).
- 4.25 We would therefore expect that a more detailed business case for the proposed bus service be provided, which clearly sets out potential funding sources to ensure that it will be a financially viable service that would require only short term subsidies from the local authority for ‘pump priming’. Similarly, predictions about likely demands should be realistic having regard to recent experiences of large scale developments in rural areas, such as is being promoted at Dunsfold Aerodrome. These assurances are important given the IHT considers:

“If ridership does not increase to the level needed for viability, either because the analysis of demand was optimistic or because the quality of the service provided was low, the service will collapse as soon as the subsidy is removed” (paragraph 2.30).

- 4.26 It is considered that if the proposed bus service was not financially viable in the long term, the travel behaviour of future residents and employees would therefore be similar to that established for the existing residents of Alfold Crossways and Dunsfold. To this end, it is noteworthy that paragraph 205 of the Inspectors report noted:

"...They will run at a loss and the Appellants propose to subsidise them from monies received from the cordon charge and the employee parking charges. However, given the relatively long distance to higher order centres there is a real risk that residents and commuters will see these charges as a form of taxation which they will bear in order to continue to use their cars. The virtuous circle becomes a vicious circle with empty buses serving very few people and increasing numbers and lengths of private car journeys to and from the new settlement, adding to carbon emissions, adding to the disturbance of rural communities along rural roads and adding further to congestion on these roads."

- 4.27 Vectos does not make any comment to the distance required to reach the nearest train station. It is accepted within the report that further analysis is required, but states that residents would link to rail stations by bus; however, no justification is given to why residents would choose to travel to train stations by bus rather than car, or indeed whether proposed bus services would link directly to the rail stations introduced in Section 2. It should also be noted that the closest rail station to any of the bus route options being considered is located approximately one kilometre away from the end of the outlined routes (Shalford) and that this station does not benefit from frequent rail services.

Sustainable Transport Opportunities – Soft Measures

- 4.28 It is envisaged that the physical measures outlined above will be supplemented by 'softer' measures such as service charges, car clubs and car share schemes, travel planning and smart technology. In order to demonstrate how these will be effective in securing a reduced reliance upon the private car, Vectos has provided a summary of various research papers. **However, insufficient evidence is provided to justify their success at reducing car dependency. Moreover, much of the research referred to appears to be focused upon existing urban areas; as such the application of them to this site is questionable.** The following text therefore sets out potential limitations associated with the measures promoted to date.

Cordon Charge and Employee Parking Levy

- 4.29 The 2008 proposals included measures that would require residents to pay a fee every time they left the site by car, and a similar levy that would require employees to pay to park on-site. It is unclear if there is still a commitment to these schemes as Vectos considers alternatives should be explored.
- 4.30 The alternative that is suggested is a proposal to instead introduce an annual service charge to include, amongst other things, a contribution towards maintaining a bus service to the site. The report states (para 5.8) that a similar approach has been successfully taken at the Caterham Barracks development, but no monitoring data appears to exist to show the success of this service, and it is unclear as to whether the service still operates. Indeed, one of the two routes that serve the bus stop within the site is now subsidised by Surrey County Council (Metrobus 409). Notwithstanding this, the 2014 option of an annual service charge is likely to be seen as a 'sunk cost' and does not provide the sort of regular reminder offered by the pay-per-usage cordon charge.

Car Club and Car Share Schemes

- 4.31 Vectos notes the 2005 DfT Good Practice Guidance 'Making Car Sharing and Car Clubs Work' demonstrates an average 21% increase in multi-occupancy vehicle usage where car sharing has been introduced. This evidence however is based on schemes within employment sites and therefore not directly applicable to this site, given that Vectos states at paragraph 4.6 of its report that over 80% of all traffic will be attributed to residential uses.

- 4.32 Moreover, it should be noted that the Carplus survey data that is referred to as a justification for the effects car clubs have upon car ownership includes sites within London, where around 80% of respondents' car clubs were located. To this end, it should be noted that the 2009 appeal Inspector considered at paragraph 206 of his report that the sustainable transport measures proposed in 2008 were "...untried in such a rural location or in relation to a free standing settlement" and as such concluded there to be "considerable doubt as to how far the transport strategy is actually likely to succeed".
- 4.33 A more recent 2013/14 Carplus report has been published but does not give directly comparable data for the statistics given in the Sustainable Transport Opportunities report; however, this excludes London and would have been more appropriate for use. Nonetheless, neither of these Carplus reports makes comment on any empirical evidence that exists for rural car clubs.
- 4.34 Due to the rural nature of the site location, it would be expected that a feasibility study is carried out and sources of funding identified. No mention is made of any proposal to 'pump-prime' any such car club scheme, or whether potential operators have been approached. A 2004 Countryside Agency report gives some of the reasons why car clubs do not progress past this feasibility phase, which included high levels of affluence and private car ownership. To this end, it is noteworthy that Table 4.7 shows current car ownership rates in the local area are circa 13% higher than the ward and borough averages. Similarly, average wages in Waverley are some 40% higher than the national average.

Cars/Vans	Alfold Crossways and Dunsfold	Alfold, Cranleigh Rural and Ellens Green Ward	Waverley
All categories	564	861	49,280
No cars/Vans	38	158	5,865
1 car or van	212	302	18,757
2 cars or vans	216	240	17,894
3 cars or vans	60	96	4,803
4 + cars or vans	38	65	1,961
Sum of all cars	1,011	1,367	77,830
Ownership Ratio	1.79	1.59	1.58

Table 4.7 – Car Ownership Rates (2011 Census Data)

Travel Plan and Site Wide Initiatives

- 4.35 It is commented that a Travel Plan will be developed and outlines that financial incentives would be offered. However, no acknowledgement is made to the fact that an effective Travel Plan needs also to contain disincentives, such as the cordon charge and employee parking levy that now appear to be being reconsidered.
- 4.36 The report commits to a personal travel planning service, but again, gives no such detail as to whether this would be appropriate in this location. Statistics are given in the report of reduction in car driver trips of between 10 and 14% for nine projects undertaken in the UK between 2005 and 2010, but it is not stated whether any of these projects were undertaken outside of major towns or cities, and indeed whether this sort of reduction in car driver trips could be maintained.
- 4.37 The report makes other comments on community vehicles/smart technology. Again, there is no detail given over to these measures; e.g. suggested frequencies, how the initiatives would be funded etc. The smart technology is simply referred to as giving flexibility for travel options, but there is no firm commitment made to deliver them or reassurance that it would be achievable in this location.

Highway Impact – A281 Corridor

- 4.38 A Paramics model has been developed by Vectos in order to evaluate the impact of the proposed development at several junctions along the A281 between Alfold Crossways and Shalford. Unlike strategic transport models, such as SINTRAM, Paramics can provide detailed assessment of the interactions between individual vehicles having regard to a range of different vehicle characteristics and driver behaviours. However, as with all transport models the accuracy of the outputs is directly linked to the data that has been referred to in its development. In this regard, it is considered that there are some potential limitations associated with the modelling presented to date. These are summarised below.
- 4.39 At paragraph 7.3 of the Vectos report it is stated that the Paramics model considers the following junctions, and that traffic data for the study area was collected in 2014:
- ▶ A281/A248 Kings Road, Shalford;
 - ▶ A281/A248 Broadford Road, Shalford;
 - ▶ A281/ Station Road, Bramley;
 - ▶ A281/Barrihurst Lane;
 - ▶ A281/Elmbridge Road, Cranleigh; and,
 - ▶ A281/Loxwood Road.
- 4.40 However, at Appendix E of the Vectos report it would suggest that turning count data was only collected for four of the above junctions. To this end, it is not clear how the Paramics model could have been validated given that it would appear that turning counts and traffic surveys were undertaken on 20th March 2014 with journey time surveys undertaken on the 26th March 2014. Given that it is not uncommon for traffic flows to be subject to daily variations of + / - 10%, there is the distinct possibility that the journey times recorded on the 26th March were not consistent with traffic conditions on the 20th March.
- 4.41 It is noted that Vectos intends to forward its LMVR and the Paramics model to SCC for its review. Having discussed this with SCC, it is understood that the LMVR has not yet been provided and as such the results generated by the Paramics model should be treated with caution. This is particularly evident given the observations that have been raised with respect to traffic generation. Moreover, it is also considered that the model does not adequately take into account the interaction that typically occurs between the A281/Kings Road and A281/Broadford Road junctions and those that Trunley Heath Road and Foxburrow Hill Road forms with the A281. It is our understanding that queue lengths from the A281/Kings Road and A281/Broadford Road junctions typically extend circa 500 to 750 metres to the south on a regular basis, and that it is not uncommon for queues to extend circa 1.5 kilometres back to the A281/Foxburrow Hill Road junction.
- 4.42 Notwithstanding the above, it should be noted that the traffic distribution profiles established by Vectos indicate a large number of trips will be made to and from Guildford. This is as to be expected given the proximity of the site and Guildford's status as a high order centre. Given that the A281 forms one of the southern approaches to the Guildford gyratory, which is currently subject to large amounts of congestion at peak times, it is considered that the study area assessed to date should be extended to include this junction. To this end, it is noteworthy that Vectos has highlighted the proximity of the gyratory in relation to its current Paramics model study area at Appendix E of its report.

Highway Impact – Local Roads

- 4.43 It is accepted that Vectos intends to undertake further work in conjunction with feedback received from key stakeholders. **However, it is considered that Vectos has not given appropriate consideration to the potential impact that a large scale development at Dunsfold Aerodrome is likely to have upon the roads that provide connections to Farnham, Godalming, Haslemere and Milford.** This is particularly evident for the following reasons:
- ▶ A significant proportion of trips attributed to future residents (i.e. 33%) and employees (i.e. 17%) are anticipated to travel to and from the west on a daily basis;
 - ▶ The most direct route to the A3 and Milford railway station is along narrow country lanes, which are crossed in numerous locations by public footpaths and/or bridleways that do not benefit from dedicated crossing facilities. These include Chiddingfold Road, Salt Lane, Station Road and Marwick Lane, which is a single track lane with passing places;
 - ▶ A circa 130 metre section of on-street parking associated with existing residential properties on the approaches to Godalming (including its railway station) result in the B2130 operating as a single carriageway road. It is noteworthy that traffic flows along this section of road are currently subject to periods of delay as a result; and,
 - ▶ The A3100/B2130 traffic signals in Godalming are currently understood to be subject to capacity constraints that lead to relatively long queue lengths and associated periods of delay at peak travel times.
- 4.44 **Given the above, it is considered that it would be premature for WBC to reach a conclusion about the acceptability of a large scale development at Dunsfold Aerodrome before the above issues have been appropriately assessed.** A key aspect of this assessment will be to demonstrate that DAL are able to deliver appropriate mitigation measures (where required).

Mitigation Measures

- 4.45 On the basis of the junction modelling it has undertaken to date, it is noted that Vectos has identified several potential mitigation schemes to offset the potential increases in traffic. These include:
- ▶ The signalisation of the A281/Kings Road and A281/Broadford Road junctions;
 - ▶ The signalisation of the A281/Station Road junction;
 - ▶ The introduction of a right turn lane at the A281/Barrihurst Road junction; and,
 - ▶ The signalisation of the A281/Elmbridge Road junction.
- 4.46 Unfortunately Appendix D of the Vectos report does not appear to include copies of the highway boundary information that it has obtained from SCC. To this end, it is not possible at this stage to confirm if all of the proposed mitigation measures can be accommodated within the public highway. However, **it is noted at paragraph 6.8 of the Vectos report that the schemes identified for the A281/Kings Road and the A281/Broadford Road junctions in Shalford are reliant upon third party land. As such there can be no guarantee that the suggested works can be delivered.** This is particularly evident in this instance given that the land in question appears to be registered as 'common land', and thus any encroachment into this land would be at the discretion of the Secretary of State, who would need to consider the proposals in conjunction with the requirements of The Commons Act 2006.

- 4.47 It is considered worthwhile to point out that Guildford Borough Council has previously resolved that protecting Common Land should take precedence over traffic congestion when considering the merits of a potential highway improvement scheme along the A320. With this in mind, it would seem doubtful that the mitigation measures identified for A281/Kings Road and the A281/Broadford Road junctions could be delivered in their current form. As this junction is currently subject to congestion in the peak periods, this casts significant doubt at this stage about the acceptability of large scale development at Dunsfold.
- 4.48 The proposals for the A281/Station Road junction in Bramley all include provision for restricted eastbound movements along Snowdenham Lane, with the exception of existing residents. This would be achieved by installing 'No Entry' signs at the Snowdenham Lane/Iron Lane junction. Whilst we do not argue that this will have a positive impact upon existing residents of Snowdenham Lane, the impact of diverting vehicles that currently use this route to access the A281 does not appear to have been appropriately assessed to date. For example, it is simply stated at paragraph 6.10 that traffic is expected to divert onto Foxburrow Hill Road or earlier in their journey. Given that the Paramics model does not include the Foxburrow Hill Road junction, the effects of the redistribution of existing traffic does not appear to have been considered to date.
- 4.49 Moreover, restricting access along Snowdenham Lane would be dependent upon a Traffic Regulation Order being granted. As this is subject to a separate statutory process there can be no guarantee that such a solution is deliverable.
- 4.50 Unfortunately the current site access proposals, which are intended to comprise a three-arm traffic signal junction, are not provided. As such, it is not possible at this stage to undertake a review of the current proposals. However, it should be noted that Traffic Advisory Leaflet 2/03 (TAL 2/03) indicates that traffic signals on high speed roads, which are defined as being roads that have 85th percentile speeds that exceed 35 miles per hour, can be subject to relatively high numbers of rear-end shunts and side impact collisions. On this basis:
- "It is strongly recommended that where the 85th percentile approach speed is greater than 45 mph on any approach, opposing right turns should be separately signalled and show only when the through traffic has been halted."*
- 4.51 Moreover, TAL 2/03 also notes that:
- "Because of the increased braking distances required at high speeds, drivers need adequate warning that they are approaching a signal-controlled junction. Advance warning signs are necessary on each approach in accordance with the requirements given in Chapter 4 of the Traffic Signs Manual."*
- 4.52 To this end, we would expect that the design be accompanied by speed surveys and a Stage 1 Road Safety Audit before the principle of traffic signals can be accepted. Based upon the information provided to date it is not clear if these assessments have been undertaken. This will be particularly important in this location given the infrequent number of traffic signal controlled junctions located along the A281, and as such drivers unfamiliar with this route are unlikely to anticipate this form of junction control on a high speed rural road. Furthermore, analyses undertaken by SCC to date show the A281 in Alfold/Dunsfold will operate over capacity in 2031, even with the lower trip rates that it has considered to date. Table 4.10 of its 2014 report refers.
- 4.53 With respect to non-motorised users, TAL 2/03 also recommends that:
- "Serious consideration should be given to reducing the 85th percentile speed of vehicles, especially where vulnerable road users are expected to cross"*.
- 4.54 Given the sustainable transport measures outlined above include enhancing existing pedestrian and cycle connections, it is considered reasonable to assume that the site access will include crossing facilities for vulnerable road users. Without prejudice to the outcome of a Stage 1 Road Safety Audit, it is also considered reasonable to assume that there may be a requirement to alter the current speed limit on the A281. As this would be subject to a separate process outside of the Town and Country Planning Act there could be no guarantee that this could be achieved, thereby further bringing into question the acceptability of traffic signals on the A281.

Summary

- 4.55 On the basis of the above, it is considered that the general approach taken by Vectos with respect to trip generation and distribution is acceptable in principle. However, **the analyses presented to date appears to significantly underestimate the levels of traffic that are likely to be generated by the proposed development** before any reductions are made to take account of trip internalisation. We would therefore expect that WBC would require the highway impact assessments presented to date to be revisited to ensure that a robust assessment with respect to the impact of a large scale development at the Dunsfold site is undertaken. It is essential that this considers the potential impacts upon the roads that connect the site with Farnham, Godalming, Haslemere and Milford.
- 4.56 **In order to justify some of the claims made with respect to the effectiveness of the sustainable transport measures, we would expect that WBC would require further evidence to be provided.** To reflect the rural location of the site, this evidence should be focused upon the experiences of recent large scale developments that are located in similarly rural areas. Reliance upon studies undertaken in well established urban areas is not considered to be applicable to this site. We would also expect Vectos to provide a detailed business appraisal for the proposed bus service given that it forms such an integral part of the sustainable transport strategy for this site.
- 4.57 **Without prejudice to this additional information being provided, it is important to note that the sustainable transport access strategy will be subject to the same limitations that the Secretary of State concluded would result in an over reliance upon the private car.** These include a reliance upon the successful outcome of further applications outside of the Town and Country Planning Act. As such, it is considered that this conclusion will be difficult to overcome, unless greater certainty can be provided about the deliverability of the improvements that have been identified for pedestrians, cyclists and public transport users. We would therefore expect DAL to undertake a detailed consultation process with all key stakeholders to ensure that the principle of the mitigation measures proposed is acceptable.
- 4.58 As with the sustainable transport strategy, it is considered that insufficient information has been provided to date with respect to vehicular access and off-site mitigation measures. **On the basis of the information to date it is considered that there are several significant limiting factors that will reduce the ability of DAL to deliver the infrastructure required to accommodate traffic associated with its development aspirations.** For example, the reliance upon third party land in Shalford together with successfully securing a TRO in Bramley. It is considered that these issues should be suitably resolved, including evidence of any agreements reached with third parties, before any allocation of the Dunsfold site in the emerging Local Plan.

5.0 Summary and Conclusions

- 5.1 Waverley Borough Council is in the process of developing a Local Plan, which will shape the location and scale of development in the borough up to and including 2031. As part of the consultation process it has commissioned Surrey County Council to undertake a high level assessment of the potential impacts associated with several development scenarios, including a new settlement at Dunsfold Aerodrome.
- 5.2 Following a review of the results, the Joint Parishes are concerned that the results presented to date by Surrey County Council are not sufficiently robust to enable a reasonable conclusion to be made about the inclusion of Dunsfold Aerodrome in the Local Plan. The Joint Parishes have also expressed similar concerns about the analyses that have been published by the current owners of Dunsfold Aerodrome, who had a planning application refused by the Secretary of State in 2009 for a large scale mixed use scheme on this site.
- 5.3 This Transport Appraisal has therefore been prepared on behalf of the Joint Parish Councils to review the transportation evidence presented to date. In summary, the report demonstrates that:
- ▶ The site is located in an unsustainable area, where there is a limited choice of transportation modes. As a result, reliance upon the private car is considerably higher than the borough average;
 - ▶ The conclusions reached by the Secretary of State from a highways and transportation perspective are still considered to be sound when assessed against the key principles of the National Planning Policy Framework (NPPF);
 - ▶ The SINTRAM model, which has formed the basis of analyses undertaken by Surrey County Council to date, is subject to some limitations that mean the results generated cannot be relied upon at the local level;
 - ▶ The assumptions made by Surrey County Council with respect to traffic generation appear to be inappropriate, which casts further doubt about the results generated to date by SINTRAM;
 - ▶ The analyses presented by Vectos also significantly underestimate the levels of traffic that are likely to be generated by a new settlement at Dunsfold;
 - ▶ Insufficient information has been presented by Vectos to provide enough certainty that the sustainable transport strategy will provide future residents and employees with access to a choice of transport modes;
 - ▶ The proposed highway mitigation strategy that is currently being considered for the A281 corridor is reliant upon third party land and further statutory processes that fall outside the Town and Country Planning Act. As such, there can be no guarantee that the measures proposed are deliverable, and thus it is considered that insufficient information has been provided to justify the inclusion of the site in the Local Plan from a highway impact perspective; and,
 - ▶ Insufficient consideration has been given to the impact that a large scale development will have upon the local roads that connect the site with Farnham, Godalming, Haslemere and Milford to the west
- 5.4 On this basis it is considered that the overall conclusion reached by the Secretary of State in 2009 with respect to the construction of a new settlement at Dunsfold Aerodrome remains valid; namely:
- "...the development would generate a considerable amount of additional road traffic and he considers that this would have a severe and unacceptable impact on an overstretched local road network and that the scheme would be unsustainable in transport terms".*
- 5.5 It is therefore concluded that the allocation of land at Dunsfold Aerodrome is inappropriate in the absence of further evidence that demonstrates the site can be made sustainable and that traffic generated will not lead to a severe impact on the local highway network. To this end, we would recommend that:

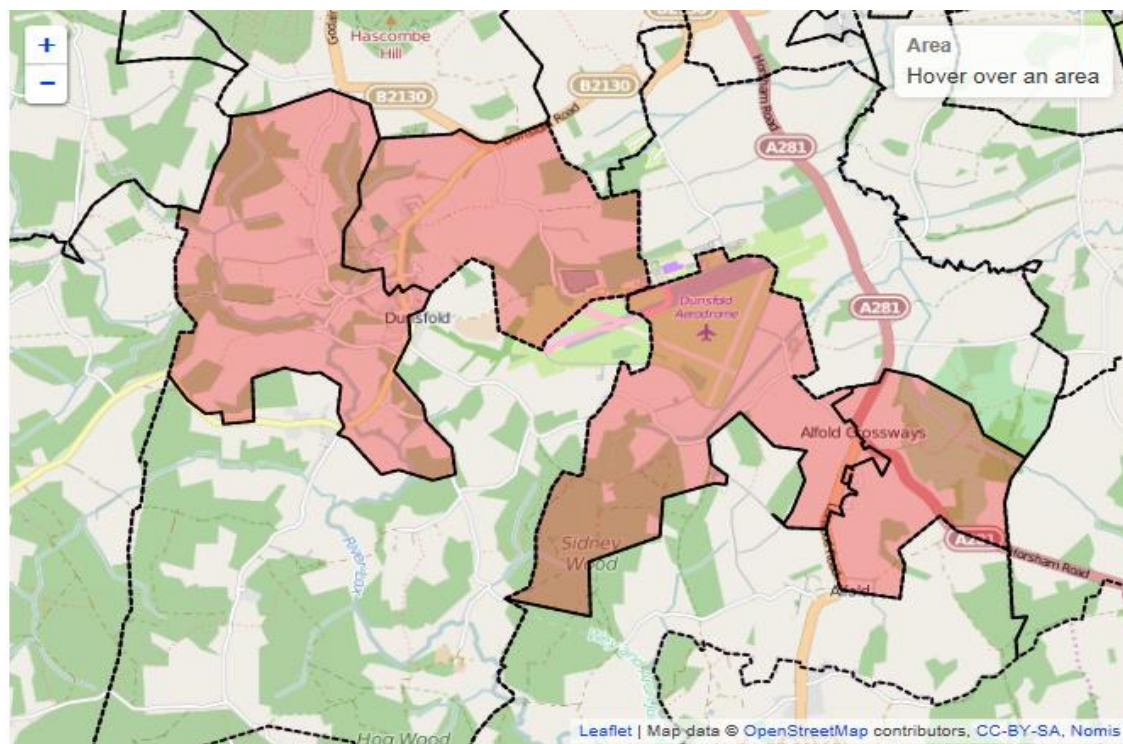
-
- ▶ The SINTRAM model is updated having regard to the outcome of revised traffic surveys to ensure that the baseline scenario reflects current traffic pattern.
 - ▶ The current study area within SINTRAM should be expanded to include all roads around Dunsfold that provide effective connections to higher order settlements.
 - ▶ The assumptions made with respect to traffic generation within the SINTRAM model should also be revised and include an evening peak assessment.
 - ▶ The analyses presented by Vectos should be refined to ensure a robust approach is taken to traffic generation from the site, including the routes that connect the site with the key local centres of Farnham, Godalming, Haslemere and Milford.
 - ▶ Further justification about how effective the sustainable transport strategy will be at improving access by non-car modes, having regard to the experience of similarly located rural settlements.
 - ▶ Greater certainty is provided that the package of sustainable transport strategy and highway mitigation measures is deliverable.
 - ▶ A detailed business appraisal for the proposed bus service should be provided to ensure that it will be commercially viable in the long term.

Appendix A

2011 Census Data – Journey to Work Statistics (Alfold Crossways and Dunsfold)

2011 Census - Journey to Work Data

Method of Travel to Work	E00157364	E00157365	E00157402	E00157403	Total		Waverley	
All categories: Method of travel to work	209	268	238	234	949		85,617	
Work mainly at or from home	13	16	13	31	73		6,031	
Underground, metro, light rail, tram	0	0	1	0	1	0.2%	173	0.3%
Train	5	4	14	21	44	7.5%	6,656	12.5%
Bus, minibus or coach	4	4	2	1	11	1.9%	1,001	1.9%
Taxi	0	0	0	0	0	0.0%	88	0.2%
Motorcycle, scooter or moped	0	2	2	1	5	0.9%	419	0.8%
Driving a car or van	90	147	125	88	450	77.1%	35,790	67.3%
Passenger in a car or van	5	4	13	7	29	5.0%	2,240	4.2%
Bicycle	1	3	0	2	6	1.0%	916	1.7%
On foot	4	12	8	10	34	5.8%	5,467	10.3%
Other method of travel to work	2	1	0	1	4	0.7%	397	0.7%
Not in employment	85	75	60	72	292		26,439	



Appendix B

Local Model Validation Report – Surrey County Council Strategic Transport Assessment



SURREY'S STRATEGIC TRANSPORT MODEL - SINTRAM

Waverley Borough Local Model Validation Report

Project Title: Surrey's Strategic Transport Model - SINTRAM

Document Title: Waverley Borough Local Model Validation Report

Client Reference:

Date: May 2014

Prepared By: Print Emma Brundle

Authorised By: Print Abi Hardie

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Amendment List

Iss. / Rev.	Iss. / Rev Date	Remove		Insert	
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1 INTRODUCTION

1.1.1 This report sets out the development and validation of Surrey County Council's strategic transport model, SINTRAM, in the vicinity of the borough of Waverley.

2 SCOPE

2.1 SINTRAM

2.1.1 Surrey County Council's transport model, SINTRAM version 6 (SINTRAM6_0_22_WavLP214_120514) was the outcome of the validation process in Waverley. The model is run in conjunction with OmniTRANS modelling program, version 6.0.22.5874.

2.1.2 Strategic models such as SINTRAM, use aggregate descriptions of traffic such as flow, density, speed and the relationships between them. The model is unable to answer detailed questions regarding traffic interactions, such as queuing and individual driver behaviour. It can however, provide approximate answers to transport problems across a vast geographical area including the level of vehicle demand, junctions and stretches of road which will be operating above their theoretical capacity, and highlighting areas where some form of mitigation is likely to be required.

2.2 Base Year

2.2.1 The model base year is 2009.

2.3 Modes of Transport

2.3.1 Vehicle classes that are represented in the model are: car; light good vehicles (LGV); and heavy good vehicles (HGV).

2.3.2 Public transport is not modelled.

2.4 Time Periods

2.4.1 The model represents a twelve-hour weekday (0700 – 1900), broken down into the following time periods:

- Weekday average AM peak hour (0700 – 1000);
- Weekday average inter peak hour (1000 – 1600); and
- Weekday average PM peak hour (1600 – 1900).

2.4.2 However, it should be noted that the model was only validated in the borough of Waverley for the average AM peak hour.

3 MODEL COVERAGE AND STUDY AREA

3.1 Model Coverage

3.1.1 SINTRAM is a strategic highway model for the county of Surrey. The model encapsulates the road network of Surrey and surrounding local authorities. The detail included in the model network becomes less refined as the distance increases from the county of Surrey. Consequently a skeleton network of strategic links is used solely to carry long distance traffic to and from Surrey and its vicinity. **Figure 3.1** presents the entire model area.

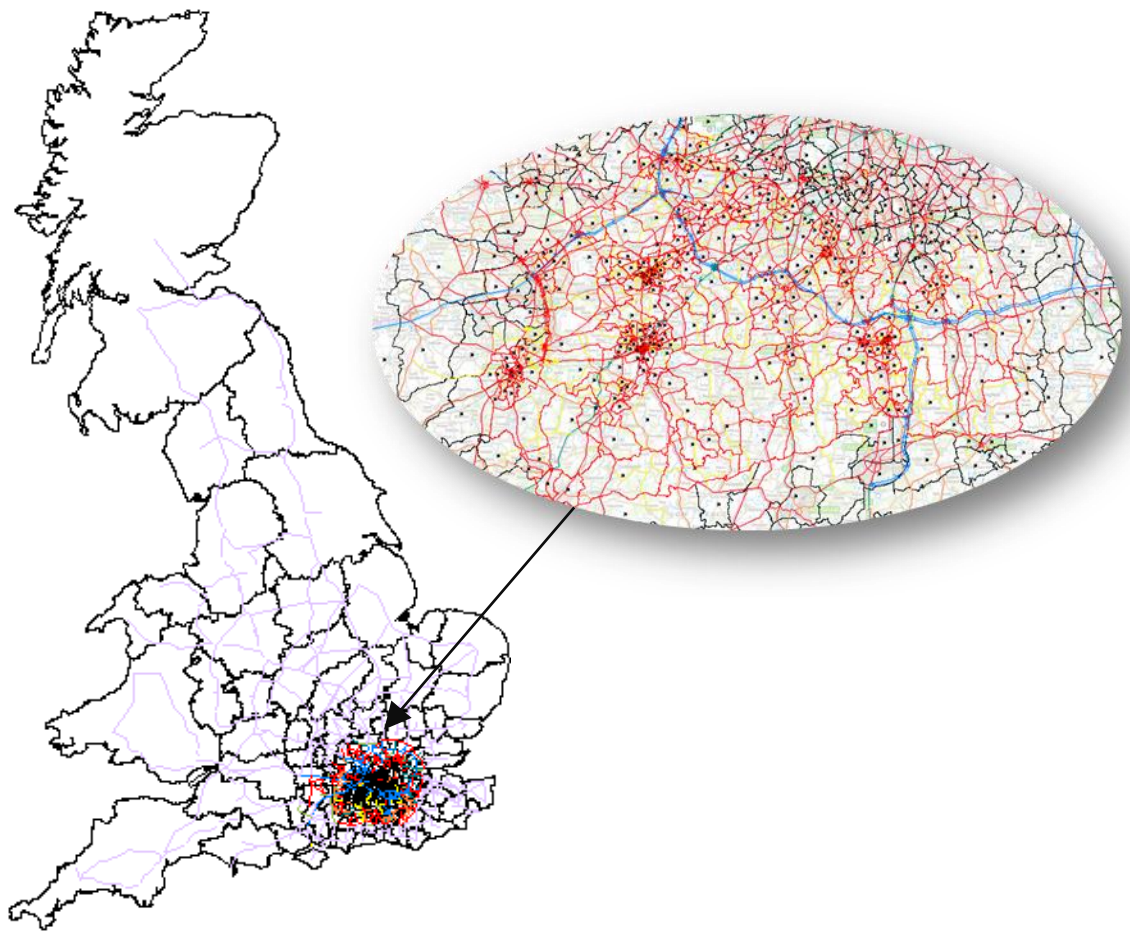


Figure 3.1: Model extent

3.1.2 All motorways A and B road, together with most local roads are represented in Surrey. Where traffic junctions and traffic signals have a significant effect in terms of delay and route choice, details of their layout and/or timing of the signals have been included in the model.

3.2 Study Area

3.2.1 The borough of Waverley and a surrounding peripheral area was incorporated within the validation process.

3.2.2 **Figure 3.2** presents the extent of the model highway network that is represented in SINTRAM in the borough of Waverley and surrounding area.

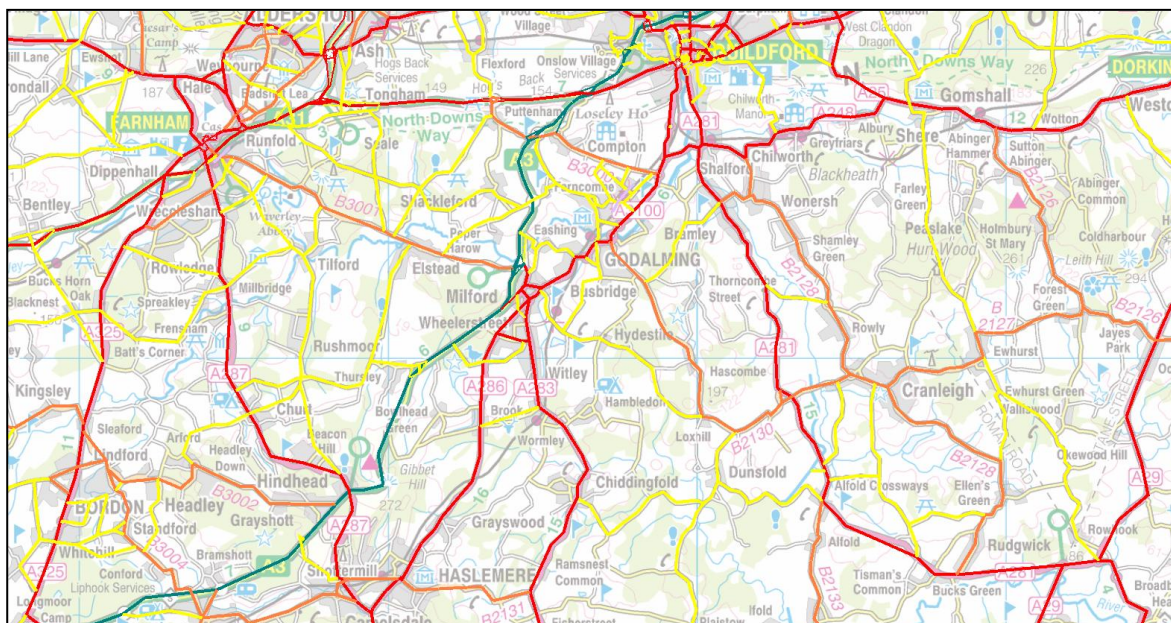


Figure 3.2: Study area of Waverley

3.3 Zones

3.3.1 There are 39 model zones in the borough of Waverley. All model zones are based on census output area boundaries, with exception to where more detail is required, such as car parks. A list of the zones is provided below:

- 71: Alice Holt
- 75: Badshot Lea
- 98: Farnham – West Street
- 108: Farnham - Compton
- 109: Runfold
- 124: Farnham Hospitals
- 125: Farnham Park
- 126: Farnham Station
- 127: Farnham Town Centre East
- 300: Farnham - Weydon Lane & Shortheath
- 309: Farnham – Firgrove Hill
- 319: Frensham & Tilford
- 320: Elstead & Thursley
- 321: Bramley & Winkworth Arboretum
- 322: Chiddingfold & Dunsfold
- 323: Witley
- 324: Alfold
- 325: Cranleigh Town Centre
- 326: Ewhurst
- 327: Haslemere - Shottermill
- 328: Haslemere
- 329: Hindhead
- 330: Milford
- 331: Wrecclesham
- 332: Farnham – Hale
- 333: Cranleigh East
- 334: Shamley Green
- 335: Wonersh
- 336: Farnham – Weybourne West
- 337: Godalming – Busbridge
- 338: Godalming Town Centre
- 339: Godalming – Charterhouse
- 340: Farncombe
- 341: Binscombe
- 468: Farnham – Dippenhall
- 471: Farnham – The Bournes
- 503: Farnham – Weybourne East
- 564: Farnham Town Centre West

4 MODEL VALIDATION

4.1 Survey Data

4.1.1 The total number of observed counts in the borough of Waverley within the model is 87. In Surrey as a whole there are 761.

4.1.2 **Appendix A** contains details of all observed counts that were made use of in the validation process.

4.2 Assignment

4.2.1 The base matrices were assigned to the network using a fixed trip equilibrium assignment. This was performed using the method of successive averages (MSA) for 100 assignment iterations.

4.3 Link Flow Validation

4.3.1 Validation simply compares modelled with observed data. The observed and modelled link flows have been compared for each model and time period, in accordance with the Department for Transport's (DfT) validation acceptability guidelines¹, presented in **Table 4.1**.

Criteria	Acceptability Guidelines
<i>Link Flows</i>	
Individual flows within 100 vph of counts for flows less than 700 vph	> 85% of cases
Individual flows within 15% of counts for flows from 700 to 2,700 vph	
Individual flows within 400 vph of counts for flows more than 2,700 vph	
GEH < 5 for individual flows	

Table 4.1: Flow validation acceptability guidelines

4.3.2 Link flow validation compares the absolute difference between modelled flows and observed counts, together with the presentation of the GEH statistic. The GEH statistic is a form of Chi-squared statistic that incorporates both relative and absolute errors, defined as:

$$GEH = \sqrt{\frac{(M - C)^2}{(M + C)/2}}$$

GEH is the GEH statistic
M is the modelled flow
C is the observed flow

4.3.3 **Table 4.2** presents the summary of the validation of the weekday average AM peak hour in terms of the DfT's acceptability guidelines. The flow criteria has been met in the average AM peak hour, but the GEH criteria is just below DfT guidance of 85% and only not met due to two counts fall outside the GEH requirement of being less than 5.

Waverley Borough	Weekday Average AM Peak Hour (0700 – 1000)		
	Values	% Met Criteria	Counts Met Criteria
No. of counts	87	-	-
Average GEH	2.75	-	-
GEH > 10	4	-	-
GEH < 5	72	83%	No
Flow Criteria	74	85%	Yes

Table 4.2: Link flow validation results for the borough of Waverley

4.3.4 **Figure 4.1** shows the modelled flows plotted against the observed with the best-fit regression line and correlation coefficient (R^2), for the weekday average AM peak hour. This helps visualise the goodness of fit. An R^2 value greater than 0.95 is considered to indicate that the model reflects observed traffic flows well. The R^2 value for the validation in Waverley borough is 0.96.

¹ Department for Transport (2014) Transport Appraisal Guidance Unit M3.1, Highway Assignment Modelling.

4.3.5 A full comparison of observed and modelled traffic flows is provided in **Appendix A**.

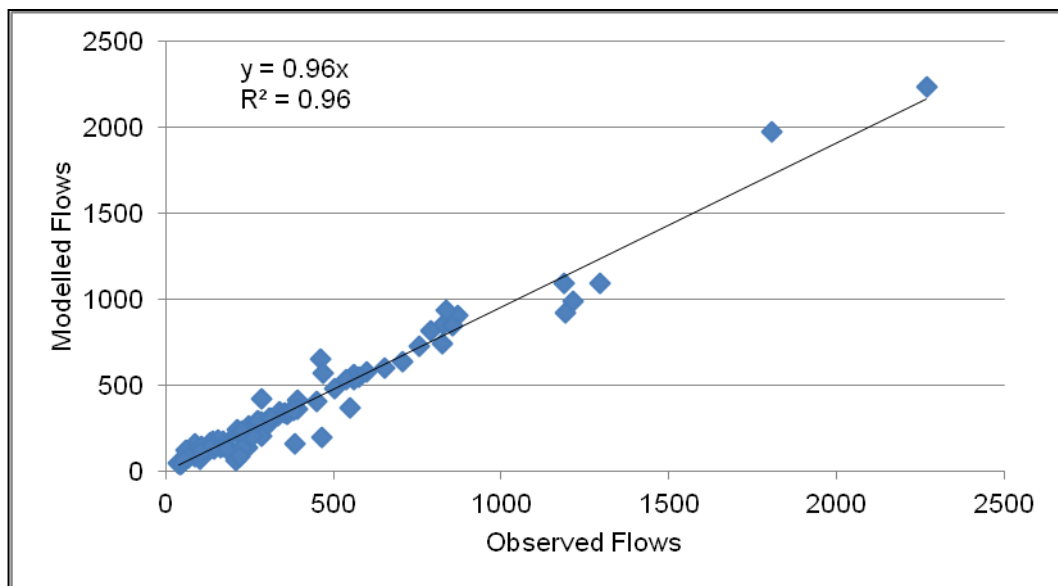


Figure 4.1: Comparison plot of modelled against observed link flows with best-fit regression line and correlation coefficient (R^2) for the weekday average AM peak hour (0700 – 1000)

4.3.6 **Figure 4.2** displays observed versus model flow bandwidth plots for the weekday average AM peak hour.

4.3.7 The bandwidths are proportional to the level of flow. A bandwidth coloured green indicates that an observed count is present on the link. Where the green bands are showing a yellow edge, the model flow is less than the observed flow. Where the green bands show a blue edge, the model flow is greater than the observed flow.

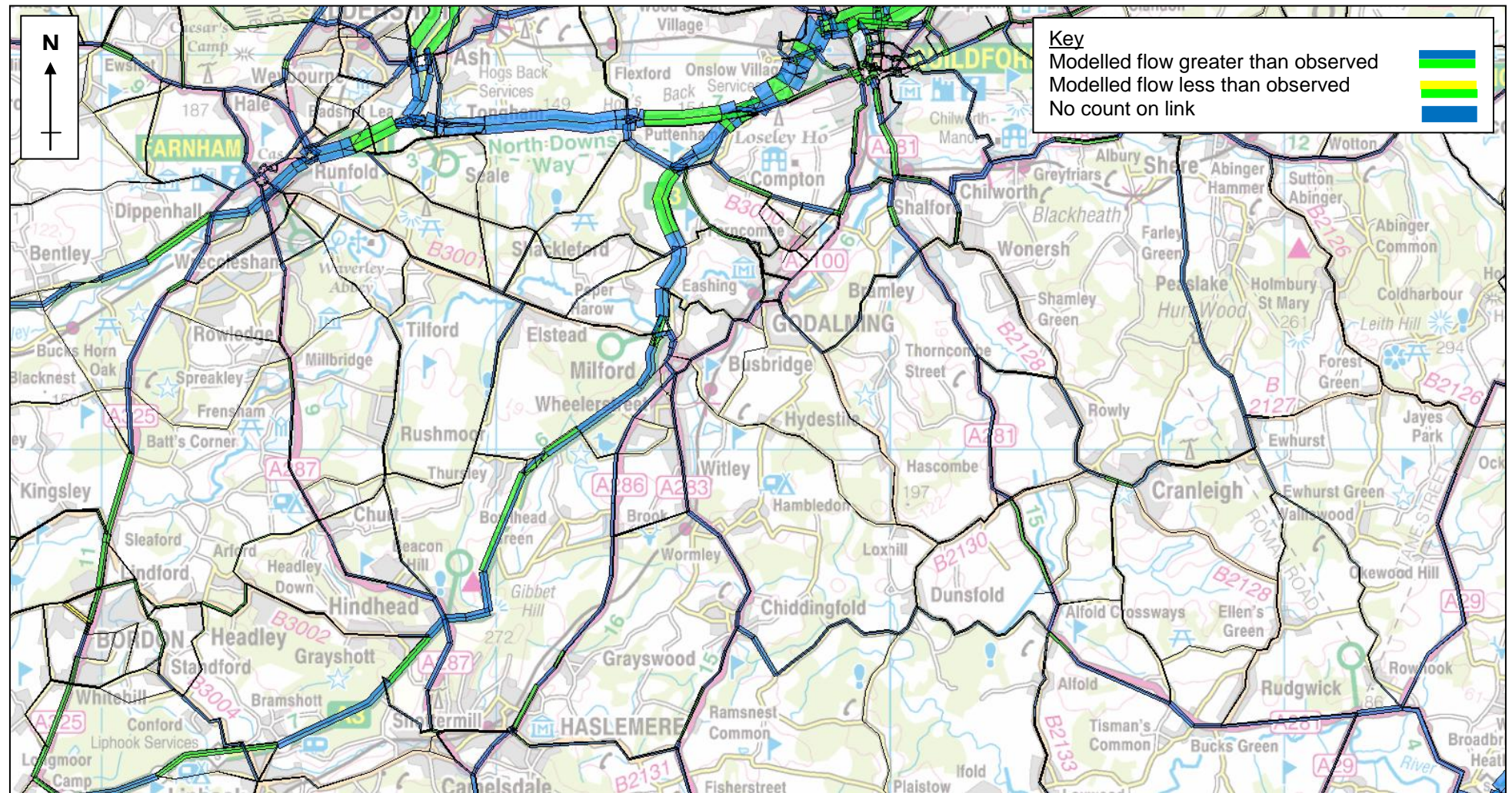


Figure 4.2: Link flow validation for the weekday average AM peak hour (0700 – 1000)

4.4 Journey Time Validation

4.4.1 Journey time validation was not undertaken in the borough of Waverley. This was due to the very restricted timescales of the Waverley Local Plan strategic transport assessment project, which this model validation was carried out for.

5 CONCLUSION

5.1.1 The 2009 base year of Surrey County Council's strategic transport model, SINTRAM has been validated in the borough of Waverley for the weekday average AM peak hour. This report documents this validation.

5.1.2 Model validation compared observed traffic flows with those obtained from the traffic model.

5.1.3 The model reached desired levels of flow validation in accordance with DfT guidance for the weekday average AM peak hour. The GEH criteria falls slightly short of the DfT guidance criteria, but this not thought to impact on the accuracy of the model. The GEH criteria would have been met if only two more modelled flows obtained a GEH value of less than 5 in two locations in the borough of Waverley.

5.1.4 The model competently reflects observed traffic flow conditions in the borough of Waverley for the weekday average AM peak hour. Thus the model is suitable for representing current traffic flow conditions as well as for option and scenario testing.

APPENDIX A – LINK FLOW VALIDATIONWeekday Average AM Peak Hour (0700 – 1000)

Count No.	Count Name	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Met Flow Criteria	GEH <5.5	GEH>10
222	A286 Grayswood Road	869	903	34	4%	1.16	✓	✓	x
223	A286 Grayswood Road	340	343	3	1%	0.19	✓	✓	x
609	Tilford Road	176	155	-21	-12%	1.65	✓	✓	x
610	Tilford Road	158	152	-6	-4%	0.48	✓	✓	x
696	A3 northbound within A283 junction	1215	988	-227	-19%	6.86	x	x	x
923	B2128 Horsham Road	86	84	-2	-3%	0.24	✓	✓	x
932	B2128 Horsham Road	789	817	28	4%	1.00	✓	✓	x
1106	B2130 Barrihurst Lane	205	100	-105	-51%	8.52	x	x	x
1107	B2130 Barrihurst Lane	260	212	-48	-19%	3.15	✓	✓	x
1110	B2131 Petworth Road	212	217	5	2%	0.35	✓	✓	x
1111	B2131 Petworth Road	334	322	-12	-4%	0.67	✓	✓	x
1112	B2128 Wonnersh Common Road	461	652	191	41%	8.10	x	x	x
1113	B2128 Wonnersh Common Road	283	418	135	48%	7.22	x	x	x
1114	B2129 The Street	172	174	2	1%	0.15	✓	✓	x
1115	B2129 The Street	306	310	4	1%	0.21	✓	✓	x
1116	B3384 Echo Barn Lane	219	222	3	2%	0.22	✓	✓	x
1117	B3384 Echo Barn Lane	111	126	15	14%	1.40	✓	✓	x
1124	C33 Dunsfold Common Road	169	144	-25	-15%	1.96	✓	✓	x
1125	C33 Dunsfold Common Road	100	66	-34	-34%	3.69	✓	✓	x
1138	A31 Alton Road	1193	922	-271	-23%	8.32	x	x	x
1140	A31 Runfold Diversion	2268	2236	-32	-1%	0.68	✓	✓	x
1141	A31 Runfold Diversion	1807	1978	171	9%	3.94	✓	✓	x
1180	A286 Grayswood Road	706	641	-65	-9%	2.51	✓	✓	x
1181	A286 Grayswood Road	248	265	17	7%	1.08	✓	✓	x
1204	A325 Farnborough Road	600	581	-19	-3%	0.80	✓	✓	x
1205	A325 Farnborough Road	824	743	-81	-10%	2.91	✓	✓	x
1206	A325 Wrecclesham Hill	755	729	-26	-3%	0.95	✓	✓	x
1207	A325 Wrecclesham Hill	559	565	6	1%	0.24	✓	✓	x
1241	B3208 Badshot Lea Road	283	284	1	0%	0.05	✓	✓	x
1242	B3208 Badshot Lea Road	353	340	-13	-4%	0.72	✓	✓	x
1415	C23 Hurtmore Road	502	479	-23	-4%	1.02	✓	✓	x
1416	C23 Hurtmore Road	547	369	-178	-32%	8.29	x	x	x
1428	Binscombe Lane	85	158	73	86%	6.60	✓	x	x

Count No.	Count Name	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Met Flow Criteria	GEH <5.5	GEH>10
1429	Green Lane	88	105	17	20%	1.76	✓	✓	x
1430	Green Lane	61	119	58	95%	6.13	✓	x	x
1431	Binscombe Lane	42	39	-3	-8%	0.55	✓	✓	x
1432	Binscombe Lane	43	39	-4	-10%	0.68	✓	✓	x
1435	Farncombe Street (Level Crossing)	139	176	37	27%	2.96	✓	✓	x
1436	Farncombe Street (Level Crossing)	153	178	25	16%	1.96	✓	✓	x
1470	C23 Charterhouse Road	383	158	-225	-59%	13.70	x	x	✓
1471	C23 Charterhouse Road	466	198	-268	-58%	14.74	x	x	✓
1476	Low Lane	37	47	10	26%	1.49	✓	✓	x
1477	Low Lane	144	129	-15	-11%	1.32	✓	✓	x
1528	B2128 High Street (east)	361	331	-30	-8%	1.61	✓	✓	x
1529	B2128 High Street (east)	577	549	-28	-5%	1.19	✓	✓	x
1530	Knowle Lane	108	110	2	2%	0.22	✓	✓	x
1531	Knowle Lane	135	138	3	2%	0.26	✓	✓	x
1532	B2128 High Street (west)	369	344	-25	-7%	1.33	✓	✓	x
1533	B2128 High Street (west)	559	534	-25	-5%	1.08	✓	✓	x
1542	Menin Way	161	133	-28	-17%	2.31	✓	✓	x
1543	Menin Way	90	103	13	15%	1.35	✓	✓	x
1544	C28 Tilford Road	130	169	39	30%	3.17	✓	✓	x
1545	C28 Tilford Road	104	145	41	40%	3.69	✓	✓	x
1546	Great Austins	244	135	-109	-45%	7.93	x	x	x
1547	Great Austins	180	126	-54	-30%	4.39	✓	✓	x
1556	B2127 Bookhurst Road	241	227	-14	-6%	0.90	✓	✓	x
1557	B2127 Bookhurst Road	289	264	-25	-9%	1.49	✓	✓	x
1710	B3007 Weybourne Road	48	49	1	2%	0.14	✓	✓	x
1731	A283 Cripplecrutch Hill	450	409	-41	-9%	1.99	✓	✓	x
1732	A283 Cripplecrutch Hill	211	237	26	12%	1.75	✓	✓	x
1735	A3 southbound off slip for A283	467	572	105	23%	4.61	x	✓	x
1736	A3 northbound between B2171 and A287	828	856	28	3%	0.97	✓	✓	x
1737	A3 southbound between A287 and B2171	853	850	-3	0%	0.09	✓	✓	x
1743	A287 Hindhead Road	391	416	25	6%	1.26	✓	✓	x
1744	A287 Hindhead Road	391	363	-28	-7%	1.45	✓	✓	x
1747	A3 northbound between Dye House Road and A283	1295	1092	-203	-16%	5.87	x	x	x
1750	Borough Road	279	284	5	2%	0.29	✓	✓	x
1751	Borough Road	303	271	-32	-11%	1.92	✓	✓	x
1754	C23 Chalk Road	283	200	-83	-29%	5.31	✓	✓	x
1755	C23 Chalk Road	226	138	-88	-39%	6.56	✓	x	x

Count No.	Count Name	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Met Flow Criteria	GEH <5.5	GEH>10
1756	Hare Lane	127	153	26	20%	2.18	✓	✓	x
1757	Hare Lane	128	140	12	9%	1.00	✓	✓	x
1760	B2130 Elmbridge Road	207	60	-147	-71%	12.77	x	x	✓
1761	B2130 Elmbridge Road	218	81	-137	-63%	11.25	x	x	✓
1762	A281 Horsham Road	651	598	-53	-8%	2.12	✓	✓	x
1763	A281 Horsham Road	258	203	-55	-21%	3.59	✓	✓	x
1764	B2133 Loxwood Road	381	355	-26	-7%	1.36	✓	✓	x
1765	B2133 Loxwood Road	133	131	-2	-2%	0.18	✓	✓	x
1766	A281 Horsham Road	536	533	-3	-1%	0.12	✓	✓	x
1767	A281 Horsham Road	272	293	21	8%	1.24	✓	✓	x
1794	A3 southbound within Thursley Junction	836	934	98	12%	3.29	✓	✓	x
1912	A3 northbound off slip for A283	102	105	3	3%	0.26	✓	✓	x
1913	A3 northbound between A287 and Dye House Road	1188	1095	-93	-8%	2.76	✓	✓	x
1918	Thursley Road	68	75	7	10%	0.80	✓	✓	x
1919	Thursley Road	51	63	12	23%	1.54	✓	✓	x
1920	A287 Frensham Road	313	307	-6	-2%	0.36	✓	✓	x
1921	A287 Frensham Road	229	233	4	2%	0.26	✓	✓	x

Appendix C

2011 Census Data – Journey to Work Statistics Comparison (Chiddingfold and Dunsfold)

2011 Census Data: Chiddingfold and Dunsfold Journey to Work Data

	Persons	Vectos Approach	Motion Approach
All Usual Residents Aged 16 to 74	2810		
Work Mainly at or From Home	261	13%	
Underground, Metro, Light Rail, Tram	7	0%	0%
Train	233	12%	14%
Bus, Minibus or Coach	30	2%	2%
Taxi	3	0%	0%
Motorcycle, Scooter or Moped	10	1%	1%
Driving a Car or Van	1163	59%	68%
Passenger in a Car or Van	84	4%	5%
Bicycle	23	1%	1%
On Foot	153	8%	9%
Other Method of Travel to Work	16	1%	1%
Total	1983	100%	100%

Appendix D

TRICS Output Reports – B2 Uses

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
 Category : C - INDUSTRIAL UNIT
 VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	WS WEST SUSSEX	1 days
03	SOUTH WEST	
	CW CORNWALL	2 days
04	EAST ANGLIA	
	SF SUFFOLK	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	NY NORTH YORKSHIRE	1 days
08	NORTH WEST	
	CH CHESHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
 Actual Range: 1100 to 17675 (units: sqm)
 Range Selected by User: 1000 to 30000 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/06 to 23/01/14

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	1 days
Wednesday	1 days
Thursday	2 days
Friday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	6 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	1
Edge of Town	3
Neighbourhood Centre (PPS6 Local Centre)	1
Free Standing (PPS6 Out of Town)	1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	4
Village	1
Out of Town	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

B1	4 days
B2	2 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,000 or Less	1 days
1,001 to 5,000	4 days
5,001 to 10,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	2 days
50,001 to 75,000	3 days
75,001 to 100,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

1.1 to 1.5	5 days
1.6 to 2.0	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	1 days
No	5 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1	CH-02-C-01	BAKERY		CESHIRE
	GADBROOK PARK			
	HIGH SHURLACH			
	NORTHWICH			
	Edge of Town			
	Industrial Zone			
	Total Gross floor area:		15000 sqm	
	Survey date:	THURSDAY	21/06/07	Survey Type: MANUAL
2	CW-02-C-01	FOOD DISTRIBUTION		CORNWALL
	WILSON WAY			
	POOL			
	CAMBORNE			
	Suburban Area (PPS6 Out of Centre)			
	Industrial Zone			
	Total Gross floor area:		10200 sqm	
	Survey date:	FRIDAY	08/06/07	Survey Type: MANUAL
3	CW-02-C-02	LIGHTING COMPANY		CORNWALL
	NORMANDY WAY			
	BODMIN			
	Edge of Town			
	Industrial Zone			
	Total Gross floor area:		17675 sqm	
	Survey date:	WEDNESDAY	06/06/07	Survey Type: MANUAL
4	NY-02-C-01	FOOD PRODUCTION		NORTH YORKSHIRE
	FEARBY ROAD			
	MASHAM			
	Neighbourhood Centre (PPS6 Local Centre)			
	Village			
	Total Gross floor area:		2491 sqm	
	Survey date:	TUESDAY	23/09/08	Survey Type: MANUAL
5	SF-02-C-01	JOINERY		SUFFOLK
	ANSON ROAD			
	MARTLESHAM HEATH			
	IPSWICH			
	Edge of Town			
	Industrial Zone			
	Total Gross floor area:		1100 sqm	
	Survey date:	FRIDAY	12/07/13	Survey Type: MANUAL
6	WS-02-C-02	AVIATION COMPANY		WEST SUSSEX
	MAYDWELL AVENUE			
	SLINFOLD			
	NEAR HORSHAM			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Gross floor area:		11375 sqm	
	Survey date:	THURSDAY	23/01/14	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
DV-02-C-01	As per Vectos selection criteria
NR-02-C-01	As per Vectos search criteria

TRIP RATE for Land Use 02 - EMPLOYMENT/C - INDUSTRIAL UNIT
VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	11375	0.149	1	11375	0.044	1	11375	0.193
07:00 - 08:00	6	9640	0.422	6	9640	0.150	6	9640	0.572
08:00 - 09:00	6	9640	0.552	6	9640	0.073	6	9640	0.625
09:00 - 10:00	6	9640	0.182	6	9640	0.124	6	9640	0.306
10:00 - 11:00	6	9640	0.124	6	9640	0.128	6	9640	0.252
11:00 - 12:00	6	9640	0.099	6	9640	0.095	6	9640	0.194
12:00 - 13:00	6	9640	0.147	6	9640	0.195	6	9640	0.342
13:00 - 14:00	6	9640	0.332	6	9640	0.187	6	9640	0.519
14:00 - 15:00	6	9640	0.130	6	9640	0.335	6	9640	0.465
15:00 - 16:00	6	9640	0.086	6	9640	0.135	6	9640	0.221
16:00 - 17:00	6	9640	0.116	6	9640	0.406	6	9640	0.522
17:00 - 18:00	6	9640	0.048	6	9640	0.448	6	9640	0.496
18:00 - 19:00	6	9640	0.111	6	9640	0.213	6	9640	0.324
19:00 - 20:00	1	11375	0.044	1	11375	0.132	1	11375	0.176
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.542			2.665			5.207

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 1100 - 17675 (units: sqm)
 Survey date date range: 01/01/06 - 23/01/14
 Number of weekdays (Monday-Friday): 6
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/C - INDUSTRIAL UNIT
OGVS

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	11375	0.000	1	11375	0.000	1	11375	0.000
07:00 - 08:00	6	9640	0.007	6	9640	0.019	6	9640	0.026
08:00 - 09:00	6	9640	0.029	6	9640	0.019	6	9640	0.048
09:00 - 10:00	6	9640	0.052	6	9640	0.026	6	9640	0.078
10:00 - 11:00	6	9640	0.041	6	9640	0.028	6	9640	0.069
11:00 - 12:00	6	9640	0.036	6	9640	0.024	6	9640	0.060
12:00 - 13:00	6	9640	0.029	6	9640	0.016	6	9640	0.045
13:00 - 14:00	6	9640	0.031	6	9640	0.022	6	9640	0.053
14:00 - 15:00	6	9640	0.031	6	9640	0.017	6	9640	0.048
15:00 - 16:00	6	9640	0.016	6	9640	0.009	6	9640	0.025
16:00 - 17:00	6	9640	0.026	6	9640	0.022	6	9640	0.048
17:00 - 18:00	6	9640	0.009	6	9640	0.009	6	9640	0.018
18:00 - 19:00	6	9640	0.014	6	9640	0.014	6	9640	0.028
19:00 - 20:00	1	11375	0.000	1	11375	0.000	1	11375	0.000
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.321			0.225			0.546

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 1100 - 17675 (units: sqm)
 Survey date date range: 01/01/06 - 23/01/14
 Number of weekdays (Monday-Friday): 6
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 3

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Appendix E

TRICS Output Reports – B8 Uses



All Vehicles

AM Peak	Arrivals	Average Trip Rates	Sites	Departures	Average Trip Rates	Sites	TOTALS	Average Trip Rates	Sites
	Self Storage	0.123	3	Self Storage	0.107	3	Self Storage	0.230	3
	Warehouses	0.158	5	Warehouses	0.104	5	Warehouses	0.262	5
	Parcel Distribution	0.272	2	Parcel Distribution	0.509	2	Parcel Distribution	0.781	2
AVERAGE		0.170			0.186			0.356	

PM Peak	Arrivals	Average Trip Rates	Sites	Departures	Average Trip Rates	Sites	TOTALS	Average Trip Rates	Sites
	Self Storage	0.143	3	Self Storage	0.129	3	Self Storage	0.272	3
	Warehouses	0.073	5	Warehouses	0.151	5	Warehouses	0.224	5
	Parcel Distribution	0.491	2	Parcel Distribution	0.491	2	Parcel Distribution	0.982	2
AVERAGE		0.178			0.212			0.390	

Daily	Arrivals	Average Trip Rates	Sites	Departures	Average Trip Rates	Sites	TOTALS	Average Trip Rates	Sites
	Self Storage	1.319	3	Self Storage	1.325	3	Self Storage	2.644	3
	Warehouses	1.344	5	Warehouses	1.344	5	Warehouses	2.688	5
	Parcel Distribution	4.403	2	Parcel Distribution	4.361	2	Parcel Distribution	8.764	2
AVERAGE		1.948			1.942			3.890	

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
 Category : E - WAREHOUSING (SELF STORAGE)
 VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	KC KENT	2 days
04	EAST ANGLIA	
	CA CAMBRIDGESHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
 Actual Range: 3205 to 5925 (units: sqm)
 Range Selected by User: 1000 to 30000 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/06 to 31/10/11

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	2 days
Thursday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	3 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	1
Edge of Town	2

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	2
Residential Zone	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

B8 3 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

5,001 to 10,000 2 days
10,001 to 15,000 1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

125,001 to 250,000 3 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

1.1 to 1.5 3 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No 3 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1	CA-02-E-03	ARMADILLO SELF STORAGE	CAMBRIDGESHIRE
	WESTFIELD ROAD		
	NETHERTON		
	PETERBOROUGH		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Gross floor area:	3205 sqm	
	Survey date:	THURSDAY	Survey Type: MANUAL
		20/10/11	
2	KC-02-E-01	EASI STORE	KENT
	LONGFIELD ROAD		
	TUNBRIDGE WELLS		
	Edge of Town		
	Industrial Zone		
	Total Gross floor area:	5925 sqm	
	Survey date:	TUESDAY	Survey Type: MANUAL
		01/12/09	
3	KC-02-E-03	BIG YELLOW STORAGE	KENT
	LONGFIELD ROAD		
	TUNBRIDGE WELLS		
	Edge of Town		
	Industrial Zone		
	Total Gross floor area:	5575 sqm	
	Survey date:	TUESDAY	Survey Type: MANUAL
		01/12/09	

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/E - WAREHOUSING (SELF STORAGE)

VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	4902	0.082	3	4902	0.041	3	4902	0.123
08:00 - 09:00	3	4902	0.136	3	4902	0.129	3	4902	0.265
09:00 - 10:00	3	4902	0.129	3	4902	0.095	3	4902	0.224
10:00 - 11:00	3	4902	0.095	3	4902	0.102	3	4902	0.197
11:00 - 12:00	3	4902	0.061	3	4902	0.054	3	4902	0.115
12:00 - 13:00	3	4902	0.122	3	4902	0.088	3	4902	0.210
13:00 - 14:00	3	4902	0.109	3	4902	0.122	3	4902	0.231
14:00 - 15:00	3	4902	0.136	3	4902	0.150	3	4902	0.286
15:00 - 16:00	3	4902	0.129	3	4902	0.116	3	4902	0.245
16:00 - 17:00	3	4902	0.095	3	4902	0.143	3	4902	0.238
17:00 - 18:00	3	4902	0.143	3	4902	0.129	3	4902	0.272
18:00 - 19:00	3	4902	0.082	3	4902	0.156	3	4902	0.238
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.319			1.325			2.644

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 3205 - 5925 (units: sqm)
 Survey date date range: 01/01/06 - 31/10/11
 Number of weekdays (Monday-Friday): 3
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
 Category : F - WAREHOUSING (COMMERCIAL)
 VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	HC HAMPSHIRE	1 days
	SC SURREY	1 days
03	SOUTH WEST	
	CW CORNWALL	1 days
04	EAST ANGLIA	
	SF SUFFOLK	1 days
08	NORTH WEST	
	LC LANCASHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
 Actual Range: 1200 to 22270 (units: sqm)
 Range Selected by User: 1000 to 30000 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/06 to 11/07/13

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	2 days
Wednesday	1 days
Thursday	1 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	5 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	2
Edge of Town	3

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	2
Residential Zone	1
No Sub Category	2

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

B8 5 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000 3 days

10,001 to 15,000 2 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000 1 days

50,001 to 75,000 1 days

125,001 to 250,000 2 days

250,001 to 500,000 1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0 1 days

1.1 to 1.5 4 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No 5 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1	CW-02-F-01 A390 THREEMILESTONE NEAR TRURO Edge of Town No Sub Category Total Gross floor area: Survey date: TUESDAY	WAREHOUSING 5150 sqm 18/09/07	CORNWALL	Survey Type: MANUAL
2	HC-02-F-01 MAURETANIA ROAD NURSLING INDUSTRIAL ESTATE SOUTHAMPTON Edge of Town Industrial Zone Total Gross floor area: Survey date: WEDNESDAY	WAREHOUSING 4000 sqm 21/11/07	HAMPSHIRE	Survey Type: MANUAL
3	LC-02-F-02 CHORLEY ROAD WALTON-LE-DALE PRESTON Suburban Area (PPS6 Out of Centre) Residential Zone Total Gross floor area: Survey date: FRIDAY	WAREHOUSING 1200 sqm 22/06/07	LANCASHIRE	Survey Type: MANUAL
4	SC-02-F-04 PRETORIA ROAD CHERTSEY Edge of Town No Sub Category Total Gross floor area: Survey date: TUESDAY	WAREHOUSING 4460 sqm 27/11/07	SURREY	Survey Type: MANUAL
5	SF-02-F-02 WALTON ROAD FELIXSTOWE Suburban Area (PPS6 Out of Centre) Industrial Zone Total Gross floor area: Survey date: THURSDAY	WAREHOUSING 22270 sqm 11/07/13	SUFFOLK	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)
 VEHICLES
 Calculation factor: 100 sqm
 BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	22270	0.018	1	22270	0.040	1	22270	0.058
06:00 - 07:00	1	22270	0.058	1	22270	0.063	1	22270	0.121
07:00 - 08:00	5	7416	0.146	5	7416	0.043	5	7416	0.189
08:00 - 09:00	5	7416	0.162	5	7416	0.124	5	7416	0.286
09:00 - 10:00	5	7416	0.108	5	7416	0.105	5	7416	0.213
10:00 - 11:00	5	7416	0.100	5	7416	0.084	5	7416	0.184
11:00 - 12:00	5	7416	0.092	5	7416	0.073	5	7416	0.165
12:00 - 13:00	5	7416	0.089	5	7416	0.084	5	7416	0.173
13:00 - 14:00	5	7416	0.092	5	7416	0.089	5	7416	0.181
14:00 - 15:00	5	7416	0.108	5	7416	0.084	5	7416	0.192
15:00 - 16:00	5	7416	0.113	5	7416	0.111	5	7416	0.224
16:00 - 17:00	5	7416	0.086	5	7416	0.143	5	7416	0.229
17:00 - 18:00	5	7416	0.073	5	7416	0.151	5	7416	0.224
18:00 - 19:00	5	7416	0.019	5	7416	0.070	5	7416	0.089
19:00 - 20:00	1	22270	0.036	1	22270	0.031	1	22270	0.067
20:00 - 21:00	1	22270	0.013	1	22270	0.031	1	22270	0.044
21:00 - 22:00	1	22270	0.031	1	22270	0.018	1	22270	0.049
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.344			1.344			2.688

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 1200 - 22270 (units: sqm)
 Survey date date range: 01/01/06 - 11/07/13
 Number of weekdays (Monday-Friday): 5
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
 Category : G - PARCEL DISTRIBUTION CENTRES
 VEHICLES

Selected regions and areas:

05	EAST MIDLANDS	
	NT NOTTINGHAMSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	RI EAST RIDING OF YORKSHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
 Actual Range: 2700 to 3000 (units: sqm)
 Range Selected by User: 1000 to 30000 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/06 to 17/06/13

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	1 days
Wednesday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	2 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Edge of Town	1
Free Standing (PPS6 Out of Town)	1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Commercial Zone	2
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This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

B8 2 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000 1 days
 25,001 to 50,000 1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000 1 days
 500,001 or More 1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

1.1 to 1.5 1 days
 1.6 to 2.0 1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No 2 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1	NT-02-G-02 CITY LINK MILLENIUM WAY PHOENIX CENTRE NOTTINGHAM Edge of Town Commercial Zone Total Gross floor area: 3000 sqm Survey date: MONDAY 17/06/13	NOTTINGHAMSHIRE Survey Type: MANUAL
2	RI-02-G-01 UK MAIL YORK ROAD ALLERTHORPE BUS. PARK NEAR POCKLINGTON Free Standing (PPS6 Out of Town) Commercial Zone Total Gross floor area: 2700 sqm Survey date: WEDNESDAY 19/12/12	EAST RIDING OF YORKSHIRE Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/G - PARCEL DISTRIBUTION CENTRES
VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	2700	0.333	1	2700	0.037	1	2700	0.370
06:00 - 07:00	1	2700	0.630	1	2700	0.148	1	2700	0.778
07:00 - 08:00	2	2850	0.351	2	2850	0.351	2	2850	0.702
08:00 - 09:00	2	2850	0.246	2	2850	0.561	2	2850	0.807
09:00 - 10:00	2	2850	0.211	2	2850	0.228	2	2850	0.439
10:00 - 11:00	2	2850	0.123	2	2850	0.070	2	2850	0.193
11:00 - 12:00	2	2850	0.123	2	2850	0.105	2	2850	0.228
12:00 - 13:00	2	2850	0.158	2	2850	0.211	2	2850	0.369
13:00 - 14:00	2	2850	0.228	2	2850	0.105	2	2850	0.333
14:00 - 15:00	2	2850	0.105	2	2850	0.211	2	2850	0.316
15:00 - 16:00	2	2850	0.246	2	2850	0.246	2	2850	0.492
16:00 - 17:00	2	2850	0.421	2	2850	0.404	2	2850	0.825
17:00 - 18:00	2	2850	0.491	2	2850	0.491	2	2850	0.982
18:00 - 19:00	2	2850	0.491	2	2850	0.596	2	2850	1.087
19:00 - 20:00	2	2850	0.158	2	2850	0.298	2	2850	0.456
20:00 - 21:00	2	2850	0.088	2	2850	0.246	2	2850	0.334
21:00 - 22:00	2	2850	0.000	2	2850	0.053	2	2850	0.053
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			4.403			4.361			8.764

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 2700 - 3000 (units: sqm)
 Survey date date range: 01/01/06 - 17/06/13
 Number of weekdays (Monday-Friday): 2
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Appendix F

Trip Generation Comparison Calculations

Dunsfold Park: Trip Attraction

Vectos Assumptions (Incl. 10% Internalisation)

Scenario 1	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential	137	654	790	464	235	699
B1	34	4	38	3	26	29
B1c/B2	12	3	15	2	10	12
B8	6	6	13	5	9	13
Hotel	20	28	48	28	20	47
Education	27	0	27	0	27	27
TOTAL	236	694	931	500	327	826

Scenario 2	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential	197	944	1142	670	340	1009
B1	147	17	164	12	113	124
B1c/B2	16	5	21	3	13	15
B8	6	6	13	5	9	13
Hotel	20	28	48	28	20	47
Education	40	0	40	0	40	40
TOTAL	427	1000	1427	716	533	1249

Scenario 3	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential	258	1235	1493	876	444	1320
B1	186	22	208	15	142	158
B1c/B2	48	13	60	7	39	46
B8	6	6	13	5	9	13
Hotel	20	28	48	28	20	47
Education	54	0	54	0	54	54
TOTAL	572	1303	1876	930	708	1637

Motion Assumptions (Incl. 10% Internalisation)

Scenario 1	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential	158	753	911	534	271	805
B1	34	4	38	3	26	29
B1c/B2	23	3	25	2	18	20
B8	12	13	24	13	14	27
Hotel	20	28	48	28	20	47
Education	27	0	27	0	27	27
TOTAL	273	800	1073	579	376	955

Scenario 2	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential	228	1088	1316	772	391	1163
B1	147	17	164	12	113	124
B1c/B2	31	4	34	3	24	27
B8	12	13	24	13	14	27
Hotel	20	28	48	28	20	47
Education	40	0	40	0	40	40
TOTAL	477	1149	1626	827	602	1429

Scenario 3	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential	298	1423	1721	1009	512	1521
B1	186	22	208	15	142	158
B1c/B2	89	12	102	8	73	80
B8	12	13	24	13	14	27
Hotel	20	28	48	28	20	47
Education	54	0	54	0	54	54
TOTAL	659	1497	2157	1073	815	1887

Net Change

Scenario 1	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential	21	100	121	71	36	107
B1	0	0	0	0	0	0
B1c/B2	11	0	10	0	8	8
B8	5	6	12	8	5	14
Hotel	0	0	0	0	0	0
Education	0	0	0	0	0	0
TOTAL	37	106	142	79	49	129

Scenario 2	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential	30	144	174	102	52	154
B1	0	0	0	0	0	0
B1c/B2	14	-1	14	0	12	12
B8	5	6	12	8	5	14
Hotel	0	0	0	0	0	0
Education	0	0	0	0	0	0
TOTAL	50	149	199	110	69	180

Scenario 3	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential	39	188	228	134	68	201
B1	0	0	0	0	0	0
B1c/B2	41	-1	41	1	34	34
B8	5	6	12	8	5	14
Hotel	0	0	0	0	0	0
Education	0	0	0	0	0	0
TOTAL	86	194	281	143	107	250