

West Sussex County Council Transport Assessment Methodology

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1 Introduction

- 1.1 This guidance is specific to the preparation of transport assessments within West Sussex. It compliments the national guidance provided by [PPG13](#) and the DfT and DCLG March 2007 [Guidelines for Transport Assessment](#) and should be read alongside these documents. Within this framework, this guidance seeks to establish a standardised methodology, which will help developers to comply with the policies in the [West Sussex Transport Plan](#) and development plans. This will include provision of a consistent multi-mode approach to sustainable accessibility, managing travel demand and impact on the transport network.
- 1.2 When an incoming Transport Assessment (TA) complies with the methodology it should help County Council Officers to make a speedy response. The guidance is also intended to provide clarity on the requirements of West Sussex County Council (WSSCC) in areas where the national guidance leaves some flexibility or scope for interpretation.
- 1.3 For the avoidance of doubt, any TA received which appears to largely consist of a Traffic Impact Assessment to the 1994 IHT guidelines, with additional paragraphs on alternative modes bolted on, will not be acceptable. **The County Council reserves the right to send non-compliant documents back to the author to be re-written according to these guidelines before we will assess their content in detail.** This will not extend to documents written prior to the publication of this guidance, provided they comply with the March 2007 national guidance.
- 1.4 **Multi-mode approach:**
- **You should seek to identify total travel demand by all modes.** Within this you should identify predicted private vehicle trips, alongside the mode share of sustainable modes. You should avoid going straight to motor vehicle trip rates and using this as a sole basis, although these will continue to be important to the highway part of the assessment.
 - **A Travel Plan should be prepared alongside the TA** and should be a key part of establishing the targets for sustainable mode share and reducing private car trip generation. This should feed into the analysis of impact on the transport network contained within the TA, **such that the two combine to form a unified whole.**
- 1.5 **Identified impacts on the transport network must be addressed according to the following hierarchy:**
- I. First reduce the total demand to travel as much as possible through sustainable location and travel plan measures including services provided on and to the site

- II. Secondly maximise mode share by sustainable modes and minimise mode share by private car by travel plan measures and also by provision of walking, cycling and PT infrastructure and services
 - III. Thirdly seek to spread or time-shift travel demand away from impacting on the peak hours of congestion on the highway network - and on PT services if these are near to being fully occupied locally - towards hours where spare network capacity exists.
 - IV. Lastly, if there is still an adverse material impact on the highway network after the above has been done, this must be offset through highway improvements, which must be achieved with no adverse impact on highway safety or to users of sustainable modes.
- 1.6 A development which does not overcome any material impact to the transport network through application of the above hierarchy will be recommended for refusal. "Material Impact" is defined in [section 10.5](#) below.
 - 1.7 The TA should demonstrate how the development, through its accessibility to key services, maximises mode share by sustainable modes and minimises private vehicle trips.
 - 1.8 All TAs will be checked against these guidelines by WSCC officers. If areas are missing or further site specific factors apply, then officers may ask for further information or analysis to be provided.
 - 1.9 All TAs should be preceded by a pre-application scoping study, which will enable site specific advice on how best to comply with the methodology. You are also encouraged to submit your full TA at pre-application in order that any further information required can be supplied without delay to determination of the planning application.
 - 1.10 This guidance is intended to be a "living document", periodically updated in the light of experience with its operation and of new information received and new national or local policy changes. **The current version will be accessible via the [WSCC website](#).** The issue date is at the bottom left of each sheet.
 - 1.11 All TA, Travel Plan (TP) and Transport Statement (TS) documents should be submitted in electronic format, such as .pdf. You should also submit a paper copy. The paper copy may omit technical appendices such as junction model runs and TRICS print outs, provided these are submitted electronically. Paper copies must be supplied of all detail scale plans, in particular those from which geometry of highway junctions for capacity assessment is measured.

2 Thresholds for requiring a Transport Assessment

2.1 The [Guidance on Transport Assessment](#) (DfT/DCLG 03/2007) provides indicative thresholds for Transport Statements, Transport Assessments and Travel Plans at [Appendix B](#). West Sussex County Council sees no reason to vary from these standards within West Sussex, with the exception of the following variations to the second table "Thresholds based on other considerations":

- All transport assessments in West Sussex must be accompanied by a travel plan. See [section 8](#) below for guidance.
- "Significant HGV movements per day" is defined as 20 or more one-way HGV movements per day
- "Any development that is likely to increase accidents or conflicts.." is likely to result in a recommendation for refusal rather than the need for a TA/TP. An increase in conflicting movements can be acceptable where these are demonstrated to be safely managed at low speeds, such that no increase in accidents is expected. An example would be provision of shared surfaces within a Home Zone development complying with the [IHIE Home Zone design guidance](#).
- Developments which fall within category 17 "Others" within the table "Thresholds based on size or scale of land use" should gather and present evidence to consider how they are placed regarding considerations 2, 3 & 4 in the second table, regarding peak hour generations, daily generations and provision of parking.

2.2 Nonetheless, the application of these thresholds for all types of developments should always be discussed with WSCC officers at scoping stage in case of any site specific factors.

2.3 Where this guidance refers to "larger developments", this should be interpreted as those at least double the scale of the relevant threshold for requiring a TA. The term "strategic development" normally refers to a development area – or within an area of search - allocated in the [West Sussex Structure Plan](#) and/or the [South East Plan](#) and/or as an SPD area within an LDF. These can normally be expected to exceed the TA thresholds by five times in size.

3 Layout of your Transport Assessment

3.1 All incoming TAs should follow the basic layout and the headings presented in this guidance, as listed below. This will help officers to find the critical information within your TA quickly and to respond accordingly. It should also help those preparing TAs for West Sussex to ensure that they have covered all matters required by WSCC and minimise the likelihood that you will be subsequently asked to provide additional information.

3.2 *All TAs and Transport Statements must start with a title page setting out:*

- The site location
- The existing use of the site, including planning use classes by gross floor area (GFA)
- Whether the permitted site use is active or on what date it fell vacant
- The proposed use of the site, including planning use classes and GFA for each use
- Any other unit measurements should also be provided for land uses where GFA is not necessarily the most reliable indicator to generation of travel demand e.g. no of employees, no of dwelling units

3.3 Although the development will be described in more detail later in the report, including any more individual characteristics, it is highly useful to officers to have these headlines provided at the head of the document. In particular, this should immediately establish whether the thresholds for the level of assessment required have been correctly applied.

3.4 Following this title page you should follow the principal headings below this point in the guidance note:

- The Site
- Policy Context
- Accessibility to Key Services
- Total Travel Demand
- Travel Plan
- Access by Sustainable Modes
- Bus Access

- Rail Access
- Walking
- Cycling
- Sustainable Mode Share
- Traffic Access
- Existing Network Traffic
- Network Traffic Growth
- Vehicular Traffic Generation
- Traffic Distribution & Assignment
- Highway Capacity Impact
- Environmental Impact of Development Traffic
- Road Traffic Accidents
- Conclusions

4 **The Site**

- 4.1 This section will include any further details of your proposals not covered by the summary in the title page, including reference to location plans and site layout plans to be provided in appendices.
- 4.2 The section can include a general description of the location and area but analysis of existing travel conditions must be left to the relevant section below.

5 **Policy Context**

- 5.1 A short section should follow setting out the most relevant policies to the site and proposed use in terms of its transport needs and effects on travel patterns and the transport network from PPG13, other relevant National Policies, the South East Plan, the West Sussex Transport Plan, the West Sussex Structure Plan, the adopted Local Plan and emerging Local Development Framework for the District or Borough concerned, including reference to any SPD for the area in question.
- 5.2 This section should not copy large sections of text from the above documents, but simply present the relevant policies with which this site is expected to demonstrate compliance.

6 Accessibility to Key Services

- 6.1 You must fully consider how accessible the site is by sustainable modes to key services. This is compulsory for residential development, but is also useful for staff employed at other types of development, whether office, industrial, retail, leisure etc.
- 6.2 The **four key services** for which Government has set targets for local authorities are **food retail, health, employment and education**. Your TA will be expected to demonstrate the service locations that residents and/or employees at your development can access by walking, cycling and public transport within 60, 45, 30 and 15 minutes at peak and off-peak periods.
- 6.3 Sustainable accessibility information is also welcomed for **other services** including non-food retail, sports and leisure facilities, entertainment and worship. For non-food retail, the analysis should show access to main and neighbourhood shopping centres and not isolated specialist stores. Many non-food retail centres may of course also be adjacent to food retail.
- 6.4 To demonstrate this, locations of these services should be plotted on a map background and travel time isochrones by walk, cycle and PT modes overlaid. Isochrones should be according to real travel routes on the ground and **not** concentric circles relating to crow-fly distances.
- 6.5 PT travel time includes walking and waiting time and the walk distance must not exceed 400m at either end of the journey.
- 6.6 Cycling speeds vary widely according to the fitness and experience of the individual, type of bike, loads carried, highway network, gradients and winds. 12Km/H is a useful average speed, reducing to 10Km/H for steeper gradients, frequent signalled junctions or crossings or vulnerable cyclists.
- 6.7 Walking speeds for fit healthy adults can be calculated by application of [Naismith's Rule](#), which specifies 1 hour per five kilometres forward plus 30 minutes for every 300m of ascent. 25% can be added to times so calculated if a high proportion of walkers are elderly, accompanying young children or carrying heavy bags, or 50% for any combination of the above.
- 6.8 Use of the "[Accession](#)" software for accessibility planning is strongly encouraged in particular for larger residential developments, defined as those which are over twice the size of the relevant TA threshold value and is required for strategic developments. All Accession work must use the "aggressive interpolation" option and the "road network distances" option and must provide evidence that correct input values have been used for all variables.

- 6.9 Relaxations in sustainable accessibility are limited to appropriate re-use of existing sites in rural areas to maintain the rural economy in full accordance with [PPS7](#), such as farm diversification projects.
- 6.10 Food retail accessibility must consider access to stores where, between them or together, shoppers can obtain fresh fruit and vegetables and all the major food groups required in order to prepare at home a nutritionally balanced diet. Shops selling only snack foods, restaurants and prepared food takeaways should not be considered.
- 6.11 Health accessibility must consider access to doctors' and dentists' surgeries and hospital services. Information on other clinics and healthcare providers is also welcomed.
- 6.12 Education accessibility must consider access to primary and secondary education. Information on access to pre-school nursery education and to further and higher education is also welcomed where appropriate.
- 6.13 Analysis of access to employment is only required for residential developments. It should include major local employers and areas where there are clusters of smaller employers. For the purpose of assessment, employment refers to full-time non-seasonal employment, although additional information on access to more flexible employment is also welcomed, provided it is clearly differentiated.

7 Total Travel Demand

- 7.1 Your TA should identify the total demand for movement of people in and out of the site by all modes for the existing and proposed uses.
- 7.2 Agree with WSCC at scoping stage what times of day should be taken forward for analysis. Where direct surveys of the existing use are available these should be used.
- 7.3 For the proposed use and retrospective estimation of a recent use, where sufficient data is available, this should be through the multi-modal trip generation rates available on [TRICS](#). Where sufficient multi-modal data is not available, alternative methods of estimating total all-mode travel demand should be discussed with WSCC at scoping stage. Vehicular trip rates from TRICS combined with mode shares from [2001 census journey to work](#) may be applicable. WSCC does not have a regular monitor of mode share for each local area, although we do collect figures for the County as whole by household survey.
- 7.4 Further guidance on the appropriate use of TRICS data is included below at paragraph 9.3 under the heading of "Site Vehicular Trip Generation" and this will generally apply to multi-modal trip rates in the same way as to vehicular trip rates, within the constraints of data availability. I refer in particular to the need to follow the guidance in the latest edition of the [TRICS Good Practice Guide](#).

8 Travel Plan

- 8.1 A full travel plan must be included in accordance with the [West Sussex Travel Plan Guidance](#). The travel plan must set targets for the sustainable mode share from the development which must interrelate with the travel demand and impact analysis in your TA.
- 8.2 Targets for trip generation and mode share must be realistic and not merely designed to minimise the highway capacity impact that is identified in the TA analysis. The development will be monitored against achievements of these targets and the developer will be required to take remedial measures should monitoring reveal a shortfall.
- 8.3 Where the final occupier is not yet known, it is recognised that some matters must be left flexible to determine with them, but these should not significantly affect the final mode share, but rather be alternative ways in which to reach the identified targets for mode share and vehicle trip generation.
- 8.4 The Travel Plan must commit that a Travel Plan coordinator is to be appointed
- 8.5 Where the transport impact is primarily in the form of goods vehicle movements, a significant part of the travel plan will be showing how the capacity and environmental impact of these vehicles in the peak hour will be minimised by:
- scheduling of movements away from peaks where possible
 - efficient routing for multiple destinations
 - using an efficient and appropriate size of vehicle for the operation of the site and the nature of the local highway network.
- 8.6 The Travel Plan should compare proposed parking levels to the West Sussex and District / Borough [Maximum Standards](#) and set out how any provision below the standard can be managed such that it does not result in illegal / inappropriate parking on the site or in the surrounding area, but by demand management. It may be useful to calculate predicted car parking accumulation through the day based on vehicular trip generations.
- 8.7 An appropriate monitoring regime must be identified for vehicle trips and total travel (all modes).
- 8.8 There must be a commitment to interventions, should travel plan monitoring show shortfall against targets, designed to address the deficit.
- 8.9 Please see the [West Sussex Travel Plan Guidelines](#) for more detail.

9 Access by Sustainable Modes

9.1 Bus Access

9.1.1 Bus access to your development must be analysed considering the following:

- Destinations served by direct routes and available with a change of bus with reasonable waiting time.
- State bus service frequencies & hours of operation. These should be compared with the opening hours of site. E.g. if use of offices is only expected during the day then information on evening services is not required. However for a use such as cinema or hotel then details of evening and weekend services are essential.
- Assess whether service frequencies and availability are sufficient to fully or partially meet the needs of the development for all or part of the time. If there is a shortfall, how can this be addressed in a sustainable way?
- For example, if the site caters for evening activities, such as a cinema, theatre or concert hall then it is important to identify if services run late enough to enable people to use bus for the return as well as the outward journey.
- The above service details should be provided both for currently existing services – [check with operators](#) for latest timetable alterations – and for proposed services to serve the development. You should check with bus operators whether any proposed amendments to routes required to serve the development are acceptable, in particular if travel times for through bus passengers may be adversely affected and/or if changes to layover/turnaround times may affect route efficiency and reliability.
- Positions of bus stops relative to site must be detailed and shown on a scale plan. Walking distance to bus stops should be as short as practicable and must be within 400m of all parts of the site.
- Walking route to bus stops must be adequate in terms of convenience, comfort, social safety – including lighting and inter-visibility – and road safety. Road crossings to reach bus stops must be safe and convenient.
- Assessment of the quality of the waiting facilities and service information available at the bus stops serving the site. Are facilities attractive to passengers, offering adequate actual and perceived social safety? Attractive, high quality bus shelters and facilities should be provided wherever practicable. Provision of real-time information is

required on routes that already have this facility and strongly welcomed as an improvement elsewhere.

- How accessible local bus services are to physically disabled people and people with visual or aural impairments and how your development can address any shortfalls.
- If any capacity issues are experienced on the local bus network at the times of day when people will wish to travel to and from your site. Does the [bus operator](#) have any plans to address this issue and can your development assist with this? What effect will your development have on any overcrowding on bus services and will any overcrowding adversely affect the attractiveness and uptake of bus as a travel mode to access your site?
- Whether any of the bus routes to your site are threatened with possible withdrawal due to low patronage levels. Can passenger revenue from your development help to contribute to the continued viability of local bus services?

9.2 Rail Access

9.2.1 Rail access to your development must be analysed considering the following:

- Whether the nearest rail station is within walking distance and if there is a suitable walk route, which meets the criteria in the walk section of this guidance below. If the station is within a reasonable walk distance but the walking route is substandard, what proposals are there to address this?
- Whether the nearest rail station is within cycling distance and if there is a suitable route for cyclists, which meets the criteria in the cycling section of this guidance below. If the station is within a reasonable cycling distance but the routes available to cyclists are substandard, what proposals are there to address this?
- If the nearest station is beyond a reasonable walking distance from the site, whether there is a convenient bus link to the station. Does the bus route meet the criteria in the bus section above or can it be improved so that it does?
- Which principal destinations are served from the rail station. List first those destinations with direct frequent trains, then other important destinations where a change of train may be required.
- List the service frequencies & hours of operation to the principal

destinations identified – and compare with opening hours of site.

- Whether capacity issues are experienced on the local rail network at the times of day when people will wish to travel to and from your site. Does [the rail operator](#) have any plans to address this issue? What effect will your development have on any overcrowding on rail services and will any overcrowding adversely affect the attractiveness and uptake of rail as a travel mode to access your site? Peak hour crowding is known to be common on the Brighton to London main line and from Horsham northwards on Arun Valley trains. It may also be relevant on busier sections of the West Coastway route such as east of Worthing.
- Whether the station offer attractive waiting facilities and a good level of actual and perceived social safety.
- Whether the station is fully accessible to people with a mobility impairment.
- For some sites, it may be necessary to consider more than one rail station. This would typically arise where either a) the two nearest stations are on different rail lines serving different destinations or b) the nearest station offers a limited rail service and facilities, but there is a larger station with a fuller range of train services and accessible facilities within a reasonable distance, ideally linked to the site by a regular bus service.

9.3 Walking

9.3.1 Walk access to your development must be analysed considering the following:

- Identify the key destinations within the walk time isochrone from the accessibility analysis and the walking routes to reach them from all parts of the development site. Are the identified routes adequate for the needs of the development site users?
- Actively consider and comment on available widths, quality of surfaces, provision of convenient and safe road crossings, provision and quality of lighting, social safety & road safety.
- Are the walking routes to local destinations suitable for all? Consider whether they cater for the needs of the elderly, disabled, visually impaired, children, use of buggies, prams, wheelchairs etc.
- Identify any shortfalls against these standards along these routes. Are any walking improvements already identified / programmed and is it appropriate for the development to provide these or contribute

financially to their provision?

- All new walking infrastructure to be provided should be designed in accordance with the principles of [Manual for Streets](#) and [DfT draft Local Transport Note 1/04 on "Policy Planning and Design for Walking and Cycling"](#)

9.4 Cycling

9.4.1 Cycle access to your development must be analysed considering the following:

- Identify the key destinations within the cycling time isochrone from the accessibility analysis and the best routes to reach them by bicycle from all parts of the development site.
- Analyse the identified routes to assess whether they are adequate for the needs of the cyclist users. The principal factors to take into account in this fall under the headings of coherence, directness, safety, attractiveness and comfort.
- In your analysis and proposals you should allow that different types of cyclists will have different needs. Adult commuter cyclists may often use a more direct trafficked road with less give way points, in preference to a more circuitous quiet or off-road route typically used by more vulnerable or less experienced cyclists and leisure cyclists.
- Guidance on how to provide adequately for cyclists is provided in the WSCC Guidance Note "[The Design and Implementation of Cycle Infrastructure in West Sussex](#)" (2006) and this should be followed. This document draws on National guidance notably including DfT draft Local Transport Notes [1/04 "Policy Planning and Design for Walking and Cycling"](#) and [2/04 "Adjacent and Shared Use Facilities for Pedestrians and Cyclists"](#).
- Whether any dedicated provision on routes to/from site exists or is required. This should take account of the hierarchy of provision at paragraph 2.1.5 of the WSCC cycle infrastructure design guidelines.
- Identify the locations in this area where cyclists are most likely to encounter problems and what interventions could address this.
- Whether any relevant schemes are already identified or programmed. Consider whether the development should be looking to provide these or make a financial contribution towards them.
- Secure and convenient cycle parking / storage will be an important part of any development. Provision must comply with the [West Sussex Parking Standards](#) along with any relevant District/Borough Council Parking Standards. Location, design and implementation of cycle parking must follow the [WSCC Cycle Parking Guidelines Design and Installation Standards](#) (2006).

9.5 Sustainable Mode Share

- 9.5.1 At this point in the assessment you should put together all the analysis and proposals above and the "soft" (i.e. non-infrastructure) measures that you are proposing to include in your travel plan, to re-consider the site generation of total person trips and the share by all the relevant modes.
- 9.5.2 Will the travel plan and sustainable transport infrastructure and service measures progressed with your development make a significant change to the mode shares to be expected from your development compared to your starting calculation? Does this justify any [adjustment to the vehicular trip rates](#) to be used in your highway capacity analysis?

10 Traffic Access

10.1 Existing Network Traffic

- 10.1.1 Agree the study area and surveys required with WSCC at scoping stage
- 10.1.2 Consider what survey information to provide on the existing road conditions. It should be comprehensive over the area where development traffic would impact on the network. [Traffic flow data](#) used in a TA should be up to date, meaning under two years old. Where a network transport model is to be used, the journey origin-destination survey information should be no more than five years old.
- 10.1.3 The dates on which surveys carried out should be shown to be representative of average conditions. ATC survey(s) near to site access will help to confirm if manual survey days are representative of overall conditions. If surveys are undertaken away from the recognised neutral months of March-May and September to November then seasonal adjustment may be required unless a “worst case” assessment of summer tourist traffic or Christmas shopper traffic is required.
- 10.1.4 Where junctions in the study area are known to be congested, queue length surveys should be provided alongside manual classified turning counts, so that these can be used to validate your junction analysis
- 10.1.5 Where traffic signal junctions with pedestrian facilities or signalled crossings near to other junctions are proposed pedestrian surveys will also be required to inform the capacity analysis.
- 10.1.6 Barrier and queue surveys are required for any railway level crossings within the study area

10.2 Network Traffic Growth

- 10.2.1 Analysis must be carried out for the identified opening year for the development and for five years from date of lodging a planning application, This rises to ten years in the case of the [Strategic Road Network](#), which is defined in Figure 6.11 of the [West Sussex Transport Plan](#).
- 10.2.2 Larger developments such as strategic housing and employment developments to be built in phases over a longer time scale may require additional assessment years, to be discussed with WSCC officers at scoping stage.
- 10.2.3 Traffic growth should be taken from [NTRF central growth](#), constrained to local trip ends from [TEMPRO](#). NTRF central growth rates for specific road types may be used where it is more appropriate to do so, such as congested main roads in urban areas. The TA must state clearly the

derivation of the growth rates.

10.3 Vehicular Traffic Generation

- 10.3.1 Vehicle trip generation rates are to be agreed at scoping stage where possible to avoid need for re-runs of analysis where figures are disputed. Trip rates will generally be taken from appropriate use of the [TRICS](#) trip generation database. An exception is an extension to an existing use, where the trip generation can be derived from surveys of the existing development, with any appropriate adjustments.
- 10.3.2 For transport network analysis, we principally look at hourly trip rates for the periods where the highway network is most congested (network peak) and for the periods when the development trip generations are greatest (development peak). Assessment of the development peak will typically be relevant for larger developments of types such as retail or leisure where the development trips peak at early or mid afternoon on Friday or Saturday and could increase traffic towards network capacities at these times. Development Planning also look at the daily trip rate with regard to TA thresholds, [parking accumulation and provision](#).
- 10.3.3 Some land uses are not fully represented on TRICS and the trip generation methodology will have to be agreed with WSCC officers on an individual basis. For more specialist uses, surveys from other sites with the same operator and similar characteristics can be used where available.
- 10.3.4 If any reduction from the trip rates typical for this type of development is proposed, this should be [justified](#) on the basis of the analysis of all person trips and mode share taking into account the sustainable infrastructure and travel plan measures proposed. This information will often not be available at scoping stage, so this would need to be a technically justified adjustment to the non-discounted trip rates agreed at scoping. Make appropriate allowance that the trip rates from TRICS may already include sites with high levels of public transport access, restricted car parking and/or successful travel plans.
- 10.3.5 Net trip generation will properly take into account trips from the previous use of the site, where it has been active in recent years. If the previous land use is still operational and available for survey its generation should be based on this. If the popularity of this use has recently declined, evidence must be supplied to back any adjustments made to survey data. Otherwise the generation should be based on TRICS in the same way as the proposed use.
- 10.3.6 Please note that where the site has been vacant for over five years, or a long enough period for traffic growth on the adjacent highway network to equal potential trip generations, any permitted use for the land cannot be

considered in trip generation calculations. The site must instead be treated as a vacant use, unless there is direct evidence that the “fall back” scenario of the permitted use is likely to materialise. This approach has recently been backed at planning appeal.

- 10.3.7 All use of TRICS must be clearly demonstrated to follow methodology fully in accordance with the latest issue of the [TRICS Good Practise Guidelines](#). This includes the choice of whether to use average or 85%ile trip rates. In particular, all TRICS site selections must follow the advice in chapter 4 on the use of location parameters in preference to regional selections. For most sites in West Sussex, use of regional selection can be limited to exclusion of data from Greater London. It is also acceptable to exclude data from Ireland and the Isle of Man, particularly if this falls outside the range of rates from mainland UK sites.
- 10.3.8 The TRICS survey site selection must be representative with regard to main and optional parameters such as, type of location, size of development, local population and car ownership, balanced against maintaining a healthy sample size. For clarification, use of the “optional parameters” should no longer be regarded as optional, where sample size permits. Full print outs must be supplied in electronic format to demonstrate how these parameters have been used.
- 10.3.9 Multiple survey days from sites collected with ATC data can produce bias in a sample that also contains manual surveys, so such duplication must be eliminated. Within TRICS this can be done by simply clicking in and out of the “selected days” screen.
- 10.3.10 The population within 1 and 5 miles screens are useful tools for excluding sites which are unsuitable due to being located in a major conurbation or a remote mountain area, which may previously have dropped out at the regional selection stage.
- 10.3.11 For most locations in West Sussex, [local car ownership](#) is higher than the national average, so sites where car ownership is below 0.5 per household should be excluded.
- 10.3.12 The TA must present its analysis clearly to demonstrate that the numbers of vehicle movements generated in the relevant time periods clearly match the trip rates per unit, from which they are derived.
- 10.3.13 The TA must demonstrate that the car parking capacity is in proportion to the parking accumulation predicted by the production and attraction of vehicle trips predicted through the day after allowance for travel plan measures such as car clubs, office cars etc and any use of shared or public car parking (e.g town centre sites). This is to ensure that developments do not either lead to problems of offsite parking in inappropriate places or provide excessive on-site parking by building to the maximum standard

irrespective of individual circumstances. Residential developments are encouraged to keep a proportion of parking provision unallocated to allow for efficient and flexible use for visitor parking and deliveries.

10.4 Traffic Distribution & Assignment

- 10.4.1 The TA must explain and justify the basis for the split of traffic between different origins / destinations. Analysis must be provided to support any assertions.
- 10.4.2 For larger applications a plan of population bands and road watersheds is preferred. Analysis of census journey to work figures may be appropriate for peak hour trips. For smaller sites on a very simple road network, use of observed turning proportions may suffice, however this approach cannot legitimately be extended to junctions remote from the site where through traffic may well take different routes from local development traffic.
- 10.4.3 The TA must provide clear diagrams to demonstrate that the traffic flows assigned to roads match the stated distribution
- 10.4.4 TAs for large developments, those at town centre sites and where a number of developments are planned close to each other, are encouraged to - and may be required to - include assessment on a network transport model using specialist transport modelling software such as [SATURN](#), [TRIPS/CUBE](#), [OMNITRANS](#), [PARAMICS](#), [VISSIM & VISUM](#), [AIMSUN](#) etc. Existing models suitable for TA work exist in some areas of the County such as Crawley, but not others. Some existing models are jointly owned models with the [Highways Agency](#) and agreement with a model steering group is required to use them. Please [contact](#) WSCC Development Planning to enquire about the terms and conditions which apply to the use of our existing models and to agree whether or not use of a network model is appropriate for your site.
- 10.4.5 The size of development at which a network model is required for a TA can vary according to a range of factors including, whether an up to date existing model is already available, whether the development interacts with other proposed or committed developments in the area, the complexity of the local transport and highway network, the levels of congestion experienced on the local transport network.
- 10.4.6 The largest strategic developments may be required to build a model if no suitable model is available. This should be discussed individually with WSCC at the earliest opportunity. In some cases WSCC may need to employ another consultant to assist in checking the model.
- 10.4.7 Where a network model is used, this may not obviate the need to use individual junction models to look at key junctions in the study area in

more detail.

10.5 Highway Capacity Impact

- 10.5.1 The junctions to be assessed should be identified and agreed with WSCC at scoping stage. In order for WSCC to agree the study area boundary we will first need to know the scale of net vehicular trip generations and have agreed the basic distribution. Alongside knowledge of whether and at what times there is existing congestion at the location, this will enable the junctions where there is a possibility of material impact from development flows to be identified. **Generally the study area will include all junctions where there is a predicted increase in total entry flows of 30 or more vehicles in any hour - or if the junction already experiences peak period congestion an increase of 10 or more vehicles - as a result of the development proposals.**
- 10.5.2 It is recognised that sometimes at scoping stage these details are yet to be confirmed. In this case "most likely" and/or "worst case" scenarios are to be agreed with WSCC for assessment.
- 10.5.3 The times of day when the impact will be highest and when road network conditions are most sensitive must be identified and agreed with WSCC at scoping stage. This will be agreed when the trip generations are discussed. Capacity analysis is to be undertaken on the junctions within the study area for these periods.
- 10.5.4 The TA should clearly show that the assessment years and traffic growth factors agreed have been correctly applied and that the base traffic flow and HGV inputs to each capacity assessment are correct.
- 10.5.5 The TA must also show that the Development traffic flows used accurately reflect the trip generations and distribution.

- 10.5.6 Traffic flow diagrams of the study network will normally be required for each of the following scenarios for each analysis time period:
- a. Base year observed (and/or modelled) traffic
 - b. Traffic generated from existing site use
 - c. Opening year do-nothing traffic = a+growth
 - d. Opening year committed development traffic
 - e. Opening year do-minimum traffic = c+d
 - f. Opening year proposed development traffic
 - g. Opening year total traffic = f+e-b
 - h. Assessment year do-nothing traffic = c+growth
 - i. Assessment year committed development traffic
 - j. Assessment year do-minimum traffic = h+i
 - k. Assessment year proposed development traffic
 - l. Assessment year total traffic = j+k-b
- 10.5.7 HGV flows may be shown in parentheses on the same diagrams or on a duplicate set of diagrams if this improves clarity. Alternatively, all flows may be shown as PCUs if the capacity analysis is done on this basis. Each of these diagrams must be clearly labelled as to which flows it contains.
- 10.5.8 Full details of junction model ([ARCADY/PICADY/OSCADY/LINSIG/TRANSYT](#)) runs must be provided so that input traffic flows, methodology and junction geometry can be checked as well as output examined in detail. Junction base traffic analyses should be validated against queue length surveys where there is existing congestion.
- 10.5.9 Accurate large scale plans e.g. 1:200 or 1:250 must be provided of each junction whose capacity has been analysed, whether existing, proposed or modified. It is most helpful if working lines used in constructing effective flare length, entry angle and visibility distances are shown on the plans. Provision of this information will generally speed up analysis of your TA by WSCC officers.
- 10.5.10 Junction assessments must fully take into account pedestrian/cyclist facilities at or adjacent to the junction, including pedestrian phases at traffic signal junctions, advanced stop lines for cyclists and pelican/puffin/toucan crossings close to other junctions.
- 10.5.11 Please ensure that you obtain details of any programmed highway schemes within the study area from WSCC and take any planned changes to road layout into account for assessment of future years.

- 10.5.12 Development Planning generally check ARCADY (roundabouts) and PICADY (priority junctions) ourselves but where traffic signals junctions are included, Traffic Signals team advice is sought on LINSIG and TRANSYT assessments. For larger strategic developments with multiple junction analyses required, we may employ a consultant to assist with resource.
- 10.5.13 The TA should include a summary table of the results for each junction arm in each test scenario for RFC or Saturation, queue length and average delay per vehicle. If a network model is used, then a summary table must be provided of the results for network performance as well as the plots of the modelled traffic flows and delays.
- 10.5.14 The analysis must identify whether the development results in a material impact to highway network performance.**
- 10.5.15 Material impact is defined by WSCC as an increase in congestion at any junction within the study area agreed at scoping stage after the effects of the travel plan, sustainable infrastructure/services and highway mitigation measures have been taken into account.**
- 10.5.16 Whether congestion is material must be assessed by reference to the following points:**
- 10.5.17 **Any queue lengths long enough to block another junction or traffic stream will constitute a material impact.** Where existing peak queues already have this effect, nil-detriment or better must be achieved.
- 10.5.18 **Average delay per vehicle increases (see Table 1 below).** Between 90 seconds and 120 seconds, minor increases of under 5 seconds will not be regarded as material, except on the [Strategic Road Network](#). 120 seconds is an absolute criterion for congestion. Above this figure any impact is considered material and so nil-detriment must be achieved, however minor the road. On the Strategic Road Network, using up reserve capacity is an issue for the continued efficient functioning of the network and so, for delays over 30 seconds, any increases must be mitigated in accordance with the [hierarchy of measures](#) at paragraph 1.5 to achieve nil-detriment.

Table 1: Average Delay per Vehicle and Material Impact

Delay in Assessment Year Do-Minimum Scenario	Delay in Assessment Year Do-Something Scenario	Material Impact on non-strategic road?	Material Impact on Strategic Road Network?
Any Value	Under 30 seconds	No	No
Under 90 seconds	Between 30 and 90 seconds but an increase to do-minimum	No	Yes
Under 90 seconds	90 seconds or over	Yes	Yes
90 seconds or over	Increase of less than 5 seconds and under 120 seconds	No	Yes
90 seconds or over	Increase of 5 seconds or more	Yes	Yes
120 seconds or over	Any increase to do-minimum	Yes	Yes

10.5.19 The ratio of flow to capacity (RFC) is a more technical measure of congestion that relates less directly to the road user's experience than average delay, so a fixed criterion has not been set for this measure. As a guide, increases in RFC to 1.0 or above will generally point to an increase in average delay that must be assessed according to table 1 above.

10.5.20 **Developments that result in a material impact that is not fully mitigated by demand management, sustainable transport and highway measures, applied according to the [hierarchy](#) at 1.5 above, will generally be recommended for refusal.**

10.5.21 **The above applies to any single entry arm of a junction.** WSCC may apply some flexibility where a very small over-capacity increase to one arm of a junction is outweighed by larger decreases to other congested arms, but would generally first seek a solution where the benefits were more

equally shared amongst the junction entry arms.

- 10.5.22 Any new highway infrastructure on non-strategic roads with a speed limit of 30mph or less must comply with the principles and guidance within the [Manual for Streets](#), other than any individual departures of detail agreed with WSCC officers.

10.6 Environmental Impact of Development Traffic

- 10.6.1 The TA must comment on environmental impacts of traffic including noise, vibration and emissions where increases in traffic flow of over 20% are predicted on any highway or where the development generates any additional HGV flows through a residential area or on a rural lane or where the development is within or adjacent to a designated [Air Quality Management Area](#) (AQMA).

10.6.2 Developments which cause any increase in traffic flow within an AQMA not mitigated by demand management, sustainable transport or highway measures will be generally recommended for refusal.

- 10.6.3 The Environmental Impact Statement for the planning application should cover the environmental impacts of off-site traffic. If this has been done correctly, the TA may only need to refer to the information from the EIS.

- 10.6.4 If there is an increase in vehicular movement, the increase in production of greenhouse gases should be calculated according to a formula for increases in vehicle mileage. [The National Energy Foundation's CO2 Calculator](#) uses a figure of 0.36Kg of CO2 produced per mile in a typical petrol car averaging 29mpg, derived from statistics from DEFRA. WSCC will not generally base any recommendation for refusal on the outcome of this calculation, as we are not aware of any commonly accepted thresholds in this field, but will pass on the information to the Local Planning Authority for them to take into account alongside the other environmental factors in their decision.

10.7 Road Traffic Accidents

- 10.7.1 Analysis is to be provided over a 5 year period in the form of a plot on a map background showing locations and severities, plus a table giving dates and times and other details.
- 10.7.2 Any junctions, bends or links with an accident rate greater than expected for the road type & traffic flows are to be identified.
- 10.7.3 Any patterns indicating safety issues, particularly with vulnerable road users, which should be resolved prior to development are to be identified.

- 10.7.4 Desirable and appropriate reductions in speeds should be considered.
- 10.7.5 The development will be expected to mitigate road safety problems that would arise from the development or will be worsened by an increase in traffic from the development or where vulnerable road users travelling to and from the development may be endangered.
- 10.7.6 The development will not be expected to resolve road safety problems on local roads where there is no net increase in traffic flow and where it does not adversely affect vulnerable road users using the development.

11 Conclusions

11.1 Your TA should conclude with a summary stating:

- The net impact of your development on the highway, public transport, walking and cycling networks.
- How the development meets the criteria for sustainable accessibility
- Any changes to public infrastructure and/or transport services required to mitigate impact and how these will be progressed
- Any additional benefits of the development and associated transport proposals for the efficient operation of local transport and increase in sustainable transport accessibility in the area.

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