

TRANSPORT PROOF OF EVIDENCE
by
Nicholas Bradshaw, Connect Consultants Limited
on Behalf of Ledbury Town Council

TOWN AND COUNTRY PLANNING ACT 1990 APPEAL
by
Ledbury Town Council in support of the refusal by Herefordshire
Council of the Outline planning application for the erection of up to
625 new homes (including affordable housing), up to 2.9 hectares of
B1 employment land, a canal corridor, public open space (including a
linear park), access, drainage and ground modelling works and other
associated works at Land North of the Viaduct, Ledbury,
Herefordshire.

LPA Reference: 171532
PINS Reference: APP/W1850/W/20/3244410
Date of Proof of Evidence: 5th June 2020

**Transport Proof of Evidence on Behalf of Ledbury Town Council
in Support of Refusal of Outline Planning Application on Land North of
the Viaduct, Ledbury, Herefordshire.**

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1.0 INTRODUCTION

1.1 Personal Details

1.1.1 This is the proof of evidence of Nicholas Bradshaw. I am a member of the Chartered Institute of Logistics and Transport and the Chartered Institution of Highways and Transportation. I have approximately 30 years' experience in the disciplines of highway engineering, traffic engineering and transport planning.

1.1.2 I am a Director and the Principal of Connect Consultants, which is a specialist firm of Transport Planning and Highway Design consultants that I formed in January 2007. Connect has a client base that includes a wide range of organisations, in both the private and public sectors. Connect has been appointed by Ledbury Town Council to advise and support the Council in its role as a Rule 6 party to the forthcoming public inquiry.

1.1.3 For the seven-year period prior to forming Connect, I held the position of Regional Director at Mayer Brown, which is a nationally based multi-disciplinary firm of consultant engineers. In total, I worked for Mayer Brown for a period of 18 years prior to which I worked for seven years at two local authorities in Surrey.

1.1.4 I have given evidence at several public inquiries including appeals, call in inquiries and local plan inquiries. I have also given evidence at informal hearings, 'O' Licence inquiries and in relation to Court proceedings.

1.1.5 In preparing my Proof of Evidence (PoE), I have adhered to the professional standards expected by the professional bodies to which I belong, and those expected of a professional Transport Planner.

1.1.6 I was instructed by Ledbury Town Council in April 2020, and I undertook a site visit on 12th May 2020.

1.2 Ledbury Town Council's Position

1.2.1 Ledbury Town Council, as a Rule 6 party, does not have an objection to the principle of the proposed development, however, Ledbury Town Council believes that the proposed access is unsatisfactory and that this could be resolved by the site having two full accesses.

1.2.2 My evidence should be read in conjunction with the evidence presented by Graham Lee of Amber Signal Services which collectively form Ledbury Town Council's transport evidence to the inquiry. My evidence demonstrates that the traffic analysis and pedestrian demand assumptions for the Bromyard Road / Hereford Road / The Homend junction which was used in the appellant's Transport Assessment is not robust. It also demonstrates that the proposed non-car access arrangements to the appeal site fall short of that which is required.

1.3 Statement of Common Ground

1.3.1 Ledbury Town Council and Connect have entered into a Statement of Common Ground (SoCG) with the Appellant's transport consultant, PJA, which was completed on 22nd May 2020.

1.4 Evidence Structure

1.4.1 The structure of my evidence is set out below.

1.4.2 **Section 2** of my evidence focusses on the Transport Assessment which supports the proposed development. I have identified flaws relating to some of the key constituent components the future traffic assessment scenario. Detailed commentary is provided, following which, I set out Connect Consultants' own calculation of the future assessment scenario. This shows that the submitted Transport Assessment underestimates the future traffic conditions, and that the submitted results of the capacity assessments of the proposed signal-controlled junctions of Bromyard Road / Hereford Road / The Homend, and Worcester Road / High Street / The Southend (the Top Cross junction) are not valid. The section concludes that the capacity problems associated with this junction, and the likelihood of vehicles rerouting via rural lanes to avoid delays at the junction, would be removed if the proposed development were to have an additional access off the Hereford Road / Leadon Way roundabout.

1.4.3 **Section 3** of my evidence provides details of how the proposed development fails to meet the National Planning Policy Framework requirement to provide safe and suitable access for all users. The section concludes that sustainable, non-car access to the site would be improved if the proposed development were to have an additional access off Hereford Road / Leadon Way roundabout.

1.4.4 **Section 4** sets out a summary of my evidence and provides my conclusions, which concur with the Ledbury Town Council view that the development site should have an additional full access off the Hereford Road / Leadon Way roundabout and is unacceptable in its proposed form.

1.5 Truth Statement

1.5.1 I have prepared this proof of evidence for the Appeal. To the best of my knowledge, its contents and the professional opinions that I have expressed are true.



Nicholas Bradshaw

2.0 TRAFFIC ANALYSIS AND ASSESSMENT

2.1 Introduction

2.1.1 This section of my evidence focusses on the Transport Assessment which supports the proposed development, herein known as the 'Viaduct site'.

2.1.2 The primary document under scrutiny is the Transport Assessment prepared by Phil Jones Associates (PJA) on behalf of the Appellants, Bloor Homes Western, dated December 2018, referred to herein as the 'PJA TA'.

2.1.3 The PJA TA followed a previous Transport Assessment written by BWB (herein referred to as the 'BWB TA'), the most recent revision of which is dated 17th July 2018.

2.1.4 The scope and methodology of the BWB TA was carried forward into the PJA TA, with some additional input by PJA included in the latter.

2.1.5 Connect Consultants has reviewed both the BWB TA and PJA TA and has identified flaws, predominantly in PJA TA Chapter 8 'Junction Assessment Methodology', specifically relating to some of the key constituent components the future assessment scenario. These constituent components of the future assessment scenario are summarised below, while detailed commentary on each is provided in the remainder of this section.

- Base traffic flows
- Committed development
- Baseline traffic growth
- Proposed development vehicle trip generation and attraction
- Proposed development vehicle distribution
- Proposed development pedestrian trip numbers and distribution

2.1.6 The combination of all of the above components is reviewed with specific focus on the resultant effect it has upon the PJA TA's capacity assessment of the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend.

2.1.7 The flaws in the methodology and data used in the above components of the future assessment scenario render the conclusions of the TA as invalid.

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- 2.1.8 In my Proof of Evidence, I have identified how these flaws can be corrected, and have produced an alternative future assessment scenario based on the Connect Consultants' method.
- 2.1.9 Graham Lee has undertaken junction capacity modelling of the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend, and the Worcester Road / High Street / The Southend signal junction (the Top Cross junction) based upon the Connect Consultants' future assessment scenario.

2.2 Base Traffic Flows

- 2.2.1 The PJA TA assesses the traffic impact of the proposed development at a number of study junctions on the local road network.
- 2.2.2 The assessment is predominantly based on traffic surveys undertaken on behalf of BWB at the study junctions on Friday 15th September 2017.
- 2.2.3 PJA states in Chapter 8 of its TA that the exception to this is the assessment of the proposed improvements to the junction of Bromyard Road / Hereford Road / The Homend, which is based on a separate, additional survey of traffic movements, queue lengths, and pedestrian movements undertaken at this junction on Thursday 25th October 2018; not the September 2017 survey data used for all the other study junctions.
- 2.2.4 Connect has reviewed the data from the two survey dates at the junction of Bromyard Road / Hereford Road / The Homend, and has found that the 2018 survey recorded less traffic through the junction than was recorded in the 2017 survey.
- 2.2.5 The 2017 survey recorded a total of 1,180 PCUs (Passenger Car Units) through the junction in the weekday AM peak hour, and 1,241 PCUs in the weekday PM peak hour (shown in BWB TA Figures 22 and 23 respectively); the 2018 survey recorded 1,161 and 1,144 PCUs respectively (derived from PJA TA Appendix K).
- 2.2.6 In other words, the 2018 survey recorded 19 fewer PCUs in the AM peak hour and 97 fewer PCUs in the PM peak hour.
- 2.2.7 With two sets of different survey results available to them, PJA opted to base their assessment on the survey with the fewest number of vehicles.
- 2.2.8 While a survey with less traffic may suit the Appellant's purposes better than one with more traffic, there is no apparent evidence or justification in the PJA TA that the 2018

survey, rather than the 2017 survey, is the most representative of normal traffic conditions.

- 2.2.9 Connect has sought evidence for which of the two surveys is the most representative of normal conditions, and has found that the week of 22nd – 26th October 2018, when the PJA TA October survey was undertaken, was the schools' Autumn Half Term week for the vast majority of England's schools.
- 2.2.10 Although Herefordshire Council's Autumn Half Term was the following week, with the rest of the country being on half term, it is likely that the usual working patterns and travel habits within Ledbury would be affected. For example, trips that would normally be made through Ledbury from locations outside Herefordshire might not have been made during the week of the survey because people would likely be taking the week off work for childcare; similarly, trips which might normally be made to meetings and events outside Herefordshire might not have been made because people based in those locations were on half-term holiday.
- 2.2.11 The advice in the Department for Transport's document 'Tag Unit M1.2' titled Data Sources and Surveys notes at paragraph 3.3.6 that "*Surveys should be carried out during a 'neutral', or representative, month avoiding main and local holiday periods, local school holidays and half terms, and other abnormal traffic periods*". The October 2018 survey falls foul of this advice.
- 2.2.12 In my opinion, PJA should have undertaken another traffic survey to increase the sample size, however that was not done, and PJA had the choice of two differing surveys.
- 2.2.13 As the 2017 surveys were undertaken in mid-September, there is no question of them being affected by school holidays, and the 2017 survey data must therefore be more likely than the 2018 survey data to be representative of normal conditions.
- 2.2.14 The reasonable and robust choice of data to use for the junction capacity assessment is therefore the 2017 data, not the 2018 data used in the PJA TA.
- 2.2.15 Notwithstanding the above, despite PJA's statement that the 2018 survey data is used for the capacity assessment of the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend, the traffic flow diagrams in PJA TA Appendix I reveal that it has fact used the 2017 survey data for the AM peak hour, not the 2018 data that PJA states. The PJA TA offers no explanation or justification for this.

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- 2.2.16 However, even though the PJA TA has used the 2017 AM peak traffic data, it attempts to forecast the 2031 assessment year traffic levels by applying the TEMPRO growth forecast for the period 2018-2031, rather than 2017-2031. Further commentary on this inconsistency is provided in section 2.4.
- 2.2.17 In summary, for the PM peak assessment of the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend, the PJA TA uses traffic data from October 2018 which has lower traffic numbers than the alternative 2017 survey data, and which is likely not representative of normal conditions because most of England was on the schools' Autumn half term at the time of the traffic survey. This cannot be considered to be robust.
- 2.2.18 For the AM peak assessment of the same junction, the 2017 baseline traffic survey data is used, but the wrong growth rates are applied to it to forecast the future assessment year baseline conditions.

2.3 Committed Development

- 2.3.1 The PJA TA includes two local committed developments in its traffic analysis; the Barratt Homes development at Land South of Leadon Way, comprising 321 dwellings, and Land Rear of Full Pitcher Inn, New Street, comprising 100 dwellings.
- 2.3.2 I have no specific concerns on this matter; however I note that there is a major Bovis development proposal for up to 140 homes on Land South of Leadon Way currently under consideration (reference number 192482).
- 2.3.3 The TA for the proposed Bovis development shows that its development traffic will affect the PJA TA road network, and if it is approved, it should also be included as a committed development.

2.4 Baseline Traffic Growth

- 2.4.1 The PJA TA uses the Department for Transport's TEMPRO tool to derive growth factors to forecast the future assessment year baseline traffic levels. As the traffic surveys were undertaken in both 2017 and 2018, two sets of growth forecasts are identified in the PJA TA; 2017-2031 and 2018-2031.

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- 2.4.2 In line with DfT guidance, the Alternative Assumptions function within TEMPRO has been used to remove from the traffic growth calculations the traffic associated with the committed developments which are subsequently added back in separately to the traffic analysis.
- 2.4.3 The Alternative Assumptions function requires the user to subtract from the default growth assumptions the numbers of households and jobs associated with the committed developments which have been allowed for elsewhere in the traffic analysis. The resultant growth calculations are automatically adjusted within TEMPRO to remove the corresponding traffic from the future scenario.
- 2.4.4 The PJA TA sets out that the two committed developments amount to a total of 421 new households. It should be noted that neither of the two committed developments include employment land uses, and therefore there are no jobs provided by either committed development.
- 2.4.5 PJA paragraph 8.4.8. states that no adjustments have been made to account for the additional households and jobs that will be created by the proposed development.
- 2.4.6 Table 8.1 of the PJA TA shows the TEMPRO default growth assumptions for both 2017-2031 and 2018-2031, in terms of the assumed increases of households and jobs.
- 2.4.7 Table 8.2 of the PJA TA shows the alternative growth assumptions input by PJA; having removed the 421 households of the committed developments, but also having removed a number of jobs, without explanation or justification for doing so.
- 2.4.8 Table 8.2 shows that the default assumptions include 5,340 future jobs, while PJA's assumptions include 5,327 future jobs; it also shows that the change in jobs (from the 2017 Base to the 2031 Future) is +223 in the default assumptions, and +150 in the PJA assumptions. This is inconsistent, and is unclear as to whether the PJA assumptions have removed 13 or 73 jobs from the default assumption.
- 2.4.9 While the figures presented in PJA TA Table 8.2 are inconsistent and do not reconcile, the result is nonetheless that PJA's Alternative Assumptions provide a false (lower) traffic growth forecast than would be provided based on the correct information.
- 2.4.10 PJA claims in paragraph 8.4.8 of the PJA TA that this is a "*worst case analysis of background traffic growth to 2031*". This approach would be robust, but it has been done incorrectly and results in an underestimate of background growth.
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- 2.4.11 Notwithstanding the incorrect data used in PJA's Alternative Assumptions, and the resultant incorrect growth factors, as set out in paragraph 2.2.16, the PJA TA attempts to forecast the 2031 assessment year AM peak traffic levels by applying the TEMPRO growth forecast for the period 2018-2031, rather than 2017-2031.
- 2.4.12 The result of this is that the 2031 baseline AM peak traffic levels used in the junction capacity assessment are lower than they should be, because the 2017 base data is multiplied by the smaller growth factor for 2018-2031 than the growth factor for 2017-2031.
- 2.4.13 For the 2031 PM peak hour, the 2017 base traffic data should have been used, which should have been multiplied by the 2017-2031 TEMPRO growth factor, which should have been based on the correct growth assumptions.
- 2.4.14 In summary, the PJA TEMPRO growth forecasts are based on incorrect assumptions, and in addition to that, the TEMPRO forecast for the incorrect growth period has been used for the AM peak hour traffic data. For the PM peak hour, the incorrect base data and the incorrect growth factors have been used. Both of these have led to an underestimation of future traffic levels, resulting in a more favourable future baseline on which to test the proposed development traffic.

2.5 Proposed Development Vehicle Trip Generation and Attraction

- 2.5.1 The PJA TA uses the same trip-rate data as the preceding BWB TA; using the industry-standard TRICS database to estimate the vehicle trips associated with each of the components of the proposed development; the B1a, B1b, and B1c employment uses, and the residential component.
- 2.5.2 The PJA TA vehicle trip rates are set out in PJA TA Table 5-2, replicated in Figure 1.

Figure 1 – Vehicle Trip Generation – PJA TA Table 5-2

Table 5-2: Vehicle Trip Generation

Land Use	Parameter	AM Peak Hour (08:00 - 09:00)			PM Peak Hour (17:00 - 18:00)		
		Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Residential	625 Dwellings	75	243	318	234	123	357
B1a	3000m ²	99	9	109	8	65	73
B1b	1800m ²	15	2	17	1	10	10
B1c	7200m ²	22	2	24	0	36	36
Total		212	256	467	243	234	476

2.5.3 TRICS is a web-based tool containing arrival and departure data recorded by surveys of a wide range of development types throughout the UK and Ireland, and which can be filtered by various parameters in order to capture data from sites with similar characteristics. The database is updated with new survey data every three months.

2.5.4 The 'TRICS Good Practice Guide 2016' (TRICS GPG) (Core Document CD1.55) states at paragraph 1.3;

"TRICS® is a very powerful and flexible system, and allows great variation in the calculation of both vehicular and multi-modal trip rates. It is possible, therefore, that two users of the system, applying different criteria and ranges to a task, may end up producing different results."

2.5.5 At paragraph 1.6, it states;

"Recipients of TRICS® data need to be assured that the data has been produced in accordance with the guidance contained within this document."

2.5.6 As advocated in the TRICS GPG, Connect has reviewed the BWB/PJA TRICS analysis, including the selection criteria and ranges, to seek assurance that the resultant trip data has been produced in accordance with the TRICS GPG.

2.5.7 I am satisfied that the TRICS data for each of the three employment use-classes is reasonable and fit for purpose, however, I do not agree with the residential trip rates used in the PJA TA.

2.5.8 The residential trip rates were derived from TRICS version 7.2.4, which was current in March 2016 at the time of the pre-application discussions between BWB and Herefordshire Council, when the trip rates were agreed.

2.5.9 The database was filtered to include surveys from 01/01/2000 - 12/05/2014, and only sites in England, excluding Greater London.

2.5.10 A filter of 350 to 1,400 dwellings was applied, and only sites classed as 'edge of town' were selected.

2.5.11 From the resultant sample of five survey sites, a single residential site in Worcester was selected on which to base the TA. Its survey date was 24/05/2002.

2.5.12 The TRICS GPG states at paragraph 11.2;

"The general rule for obtaining a representative sample of data is to include as many sites as possible. But this should not be to the detriment of selection criteria. Wherever possible, users should aim to use as stringent a set of criteria as possible and obtain a representative, reasonable sample of surveys..."

...TRICS® suggests that a more "inclusive" than "exclusive" approach to site filtering is applied, as long as search criteria are not compromised."

2.5.13 Paragraph 11.3 of the TRICS GPG states;

"If it is clear from auditing supplied TRICS® data that there are more sites within the database which match all relevant criteria for inclusion than those presented by the data supplier, the data recipient can insist on the inclusion of these further sites in a revised data set, on the condition that the selection criteria are agreed between both parties."

2.5.14 On the basis that BWB/PJA's use of a single-site sample size is not best practice, and in light of the advice contained in the TRICS GPG paragraph 11.3, Connect has undertaken its own TRICS assessment to create a revised dataset.

2.5.15 Connect has used the current TRICS version 7.7.1, and has followed the guidance in the TRICS GPG.

2.5.16 The first stage of selection criteria is the same as that used by BWB/PJA:

Main Land Use: 03 - RESIDENTIAL

Sub Land Use: A - HOUSES PRIVATELY OWNED

Calculation Options: Vehicle Trip Rates

Regions: All England except Greater London

2.5.17 The following step in the TRICS criteria selection process is 'Primary Filtering', within which, the selections made by Connect are as follows:

Trip Rate Parameters: Dwellings

2.5.18 This is to specify the resultant vehicle trip rates as a value per dwelling, which is subsequently multiplied by the proposed total number of dwellings.

Parameter Range: 200 – 1,200 dwellings

2.5.19 A narrower range of 300 – 1000 dwellings was initially selected, but after the primary and secondary filtering process was complete, the resultant sample comprised a single site in West Sussex, which is considered too small a sample size to be representative.

2.5.20 This range was subsequently expanded to 200 – 1,200 so as to continue to exclude data from the smallest-sized residential developments, and to include sites up to approximately twice the size of the proposed development, without including sites that are substantially larger than the proposal.

Selected Dates: 01/01/12 to 19/11/2019

2.5.21 This is the default range of survey dates.

Week days to include: Weekdays only

2.5.22 This is consistent with the BWB/PJA assessment.

Location Types to include: Suburban Area, Edge of Town, Neighbourhood Centre

2.5.23 The potential compatibility of the various location-type categories within TRICS is set out in Table 1 of the TRICS GPG, which indicates that there is possible compatibility between 'edge of town centre', 'suburban', 'edge of town', 'neighbourhood centre', and 'free standing' locations. The accompanying text in paragraph 4.6 states;

"Clearly, there are many "borderline" cases where compatibility between a number of different location types may be possible. Therefore, the guide shown above is not to be taken as an absolute table of compatibility."

2.5.24 Paragraph 4.7 of the TRICS GPG states;

"In the first instance, it is recommended that users include sites across location types that are possibly compatible, and then examine the individual site locations in more detail using facilities such as Google Maps, before refining the dataset further based on visual location."

2.5.25 The BWB/PJA approach is to select only sites in an 'edge of town' location, which is overly restrictive, given the advice set out above.

2.5.26 Based on the location of the proposed development in relation to Ledbury, and the characteristics of the local area, it would not be suitably compatible with 'edge of town centre' survey locations, nor would it be compatible with 'free standing' locations. As such, 'suburban', 'edge of town', and 'neighbourhood centre' sites have been selected.

2.5.27 It is noteworthy that Chapter 6 of the PJA TA calculates the development's non-motorised-user (NMU) trips (cycle and pedestrian trips), which it does by selecting sites from TRICS version 7.5.3 in both 'edge of town' and 'suburban' locations. This indicates that PJA is satisfied that the proposed development location is compatible with more than solely the 'edge of town' category used by BWB and PJA for the vehicle trip calculations.

2.5.28 The next step in the sequence of TRICS criteria selection is 'Secondary Filtering', within which, the selections made by Connect are as follows:

Use Class: C3

2.5.29 This is representative of the residential component of the proposed development.

Population < 1 Mile: Up to 10,000

2.5.30 Approximately half of the town of Ledbury is within a one-mile radius of the centre of the proposed development. The population of Ledbury was 9,290 in the 2011 Census.

2.5.31 The BWB/PJA approach is to include sites with a population of up to 15,000 within one mile.

2.5.32 By selecting survey sites with a population of up to 10,000 within one mile, which is the most compatible of the available options, the resultant dataset will contain sites only in similar-sized market towns to Ledbury.

Population < 5 Miles: 25,001 - 100,000

2.5.33 This is the resultant range for this criterion after the previous criteria selections have been made.

2.5.34 While 100,000 people within five miles of the site is not the most accurate representation of the proposed development site location, it is considered that more emphasis should be given to selecting an accurate representation of the population within one mile, as the local population will likely have more of an influence on the trip rates.

2.5.35 The resultant dataset contains five survey sites, ranging from 207 dwellings to 799 dwellings. The TRICS output files are provided at Appendix NPB/01.

2.5.36 The resultant residential vehicle trip rates and trip numbers in the weekday AM and PM peak hours are set out in Table 1, which can be compared to the PJA TA residential vehicle trip rates and numbers in Figure 1.

Table 1 – Residential Vehicle Trip Rates – Connect Consultants’ Method

Vehicles	Trip Rates per unit			Trip Numbers for 625 units		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM peak	0.186	0.456	0.642	116	285	401
PM peak	0.397	0.18	0.577	248	113	361

- 2.5.37 In summary, by following the advice in the TRICS GPG, the resultant residential trip rates identified by Connect Consultants are significantly higher in the weekday AM peak, at 401 vehicle movements, than those used in the BWB and PJA TAs, at 318 vehicle movements.
- 2.5.38 The Connect Consultants method results in 361 vehicle trips in the PM peak hour, compared to the 357 used in the BWB and PJA TAs.
- 2.5.39 I therefore conclude that the PJA TA significantly underestimates the weekday AM peak hour trip generation of the residential component of the proposed development.

2.6 Proposed Development Vehicle Trip Distribution

- 2.6.1 Connect Consultants has reviewed the methodology used in the PJA TA to assign the proposed development traffic to the local road network.
- 2.6.2 The vast majority of the proposed development traffic is assumed to travel through the junction of Bromyard Road / Hereford Road / The Homend, comprising 88.4% of the employment-based traffic and 93.0% of the residential-borne traffic.
- 2.6.3 I am satisfied that the PJA TA traffic distribution methodology is robust, and that the resultant distribution on the local roads and junctions forms a reasonable assumption for the purposes of the TA.

2.7 Proposed Development Pedestrian Trip Numbers and Distribution

- 2.7.1 Chapter 6 of the PJA TA considers the trip generation and distribution of non-motorised users (NMUs), comprising pedestrian and cyclists.
- 2.7.2 PJA has again referred to the TRICS database to predict the numbers of pedestrians and cyclist generated by, and attracted to, each of the component parts of the proposed development.
- 2.7.3 Connect Consultants has reviewed the TRICS selection criteria used by PJA, and I am satisfied that the resultant pedestrian and cycle trip data is robust.
- 2.7.4 It is worth noting, however, that PJA has in this instance selected sites within England (excluding London), Wales and Scotland, and has selected sites in 'edge of town' and

'suburban' locations; a far wider range of selection criteria than was used for the vehicle trip rate assessment.

- 2.7.5 This suggests that PJA is also of the view that the vehicle trip selection criteria used in their TA is overly restrictive.
- 2.7.6 Connect Consultants has also reviewed the methodology used in the PJA TA to predict the distribution of the pedestrian and cycle trips within the local roads, pedestrian routes and cycle routes.
- 2.7.7 I am satisfied that the assumed numbers and distribution of development-related pedestrian and cycle trips is reasonable and appropriate.
- 2.7.8 However, the PJA TA considers NMU trips only in terms of the 12-hour period 07:00-19:00, and does not attempt to identify and take into account the impact of pedestrian movements in the weekday AM and PM peak hours at the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend.
- 2.7.9 Connect Consultants has used the TRICS residential pedestrian trip data, provided in PJA TA Appendix H, to calculate the AM and PM peak hour pedestrian trip numbers.
- 2.7.10 PJA's method of calculating the employment-based pedestrian and cycle trips has been replicated to calculate the AM and PM peak hour pedestrian trips associated with the proposed employment uses.
- 2.7.11 The resultant total development-related pedestrian trips in the AM and PM peak hours are set out in Table 2.

Table 2 – Peak-Hour Pedestrian Trip Generation/Attraction

	Total AM Peak	Total PM Peak
Residential	87	65
Employment	46	37
Total	133	102

- 2.7.12 PJA TA Figure 6-1 shows that across the 12-hour period 07:00-19:00, 53 of the proposed development pedestrian trips will remain internal to the development site, 163 will cross Hereford Road to New Mills Way, 379 will cross Hereford Road to the Town Trail, and 391 will cross Bromyard Road at the proposed new signal-controlled junction.

2.7.13 This equates to 39.7% of the total development pedestrian trips using the proposed new signal-controlled junction of Bromyard Road / Hereford Road / The Homend.

2.7.14 Applying the same 39.7% to the AM and PM peak hour pedestrian trip numbers identifies the number of peak-hour development-related pedestrian trips that will cross at the proposed new signal-controlled crossing. This is shown in Table 3.

Table 3 – Peak-Hour Pedestrian Trips at Proposed New Signal Crossing

	AM Peak	PM Peak
Pedestrian Trips	53	40

2.7.15 PJA produced a Technical Note dated 3rd May 2019, which includes some additional analysis of the peak-hour pedestrian demand at the junction. The PJA Technical Note concedes that the proposed signal-controlled pedestrian crossing will be called more frequently than predicted in the PJA TA, with similar predicted numbers of peak-hour pedestrian movements to those shown in Table 3 above.

2.7.16 These development-related pedestrian trips must be taken into account in the junction capacity assessment of the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend, as they will have an impact on the frequency at which the pedestrian crossing is 'called', which in turn has an impact on the duration of the vehicle movements through the traffic signals' cycle.

2.7.17 It must also be borne in mind that the proposed development will deliver improvements to the pedestrian facilities and infrastructure on Hereford Road, which will result in walking becoming a more attractive and popular travel option for many of the existing local residents and visitors.

2.7.18 This, alongside the British Government's Green Agenda, will likely lead to an increase in the baseline level of walking as a travel mode.

2.7.19 This baseline increase must also be taken into account in the capacity assessment modelling of the proposed signal-controlled junction.

2.8 Capacity assessment of the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend.

- 2.8.1 The proposed development includes the provision of modifications to the existing priority-controlled junction of Bromyard Road / Hereford Road / The Homend. It is proposed to install traffic signals to control all three junction approaches, including a signal-controlled pedestrian crossing over the Bromyard Road approach to the junction.
- 2.8.2 The PJA TA uses the industry-standard LinSig computer software to model the operation and capacity of the proposed junction.
- 2.8.3 The LinSig model is based on specific geometric parameters of the junction design and layout, and its operation and capacity are assessed in the predicted future scenario of '2031 base + committed developments + proposed development'.
- 2.8.4 As set out in the preceding sections of my evidence, there are a number of flaws relating to the constituent elements of calculating the future assessment scenario, which have resulted in an underestimate of the future traffic conditions, and hence a more favourable scenario in which to present the proposed development.
- 2.8.5 The specific issues with the PJA TA's calculation of the future assessment scenario are summarised below, along with Connect Consultants' method to rectify each issue.

Base flows

- 2.8.6 The PJA TA uses observed PM peak traffic data for this junction from October 2018. This survey data has lower traffic numbers than were observed in the 2017 survey of the same junction, and is likely not representative of normal conditions because most of England's schools were on Autumn half term at the time of the 2018 traffic survey.
- 2.8.7 In the absence of evidence of justification that the (lower) traffic levels recorded in the 2018 surveys reflect normal conditions, the reasonable and robust method should be to use the 2017 survey data for this junction, as there is no likelihood that it was affected by school holidays, and is therefore more likely to be representative of normal traffic conditions.
- 2.8.8 The junction turning movements used in the PJA TA are shown in Figure 2 below, while the reasonable and robust turning movements are shown in Figure 3 below.

2.8.9 Comparing the two PM peak flow diagrams clearly shows the higher traffic flows in the 2017 PM peak versus the 2018 PM peak used in the PJA TA.

Figure 2 – Base Turning Movements Used in PJA TA

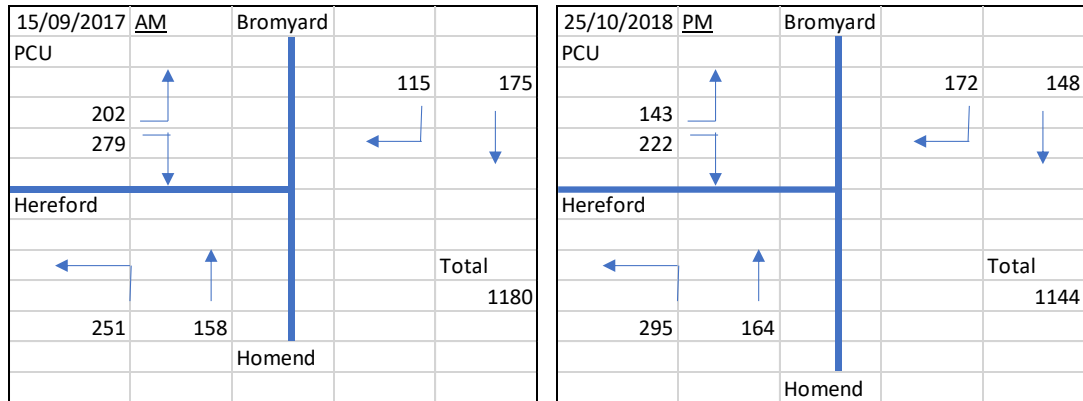
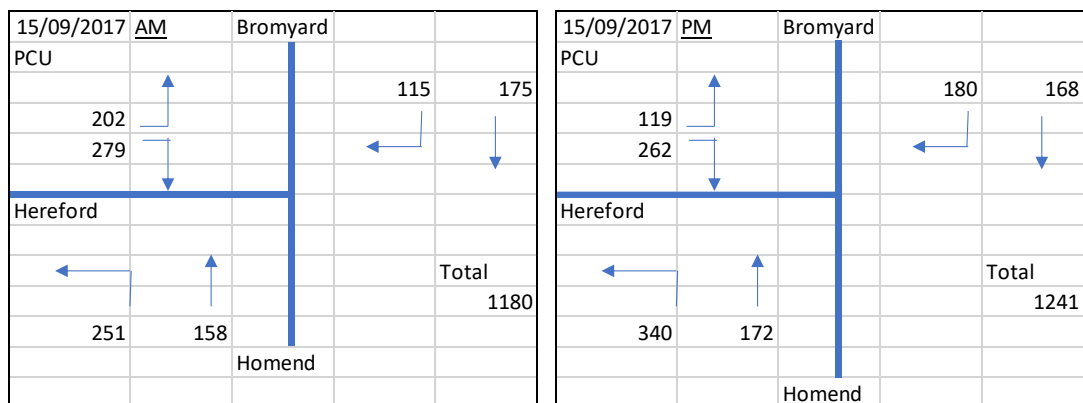


Figure 3 – Base Turning Movements - Connect Consultants' Method



Baseline traffic growth:

- 2.8.10 The PJA TEMPRO growth forecasts are based on incorrect assumptions, and in addition to that, the TEMPRO growth rate forecast for the incorrect forecast period has been used for the AM peak hour traffic data. The PM peak traffic data is based upon the wrong base survey data and the wrong TEMPRO growth rate. This has led to an underestimation of future traffic levels, resulting in a more favourable future baseline on which to test the proposed development traffic.
- 2.8.11 The 2017-2031 growth rates used in the PJA TA, which incorrectly remove jobs from the Alternative Assumptions growth calculations, are set out in Table 4, alongside the

equivalent growth rates derived by Connect Consultants, removing only the 421 households associated with the identified committed development.

Table 4 – TEMPRO Growth Rates – PJA TA vs Connect Consultants

Period	PJA TA		Connect Consultants	
	AM	PM	AM	PM
2017-2031	1.121	1.1147	1.1225	1.1162

2.8.12 The Connect Consultants method is to multiply the 2017 AM and PM peak base traffic turning movements, shown in Figure 3, by the (Connect Consultants’) AM and PM TEMPRO growth rates, respectively.

2.8.13 The PJA TA 2031 base turning movements are shown in Figure 4, so as to compare with the Connect Consultants 2031 base turning movements, shown in Figure 5. The notably higher future baseline PM peak traffic numbers are clearly evident in the latter.

Figure 4 – 2031 Base Turning Movements Used in PJA TA

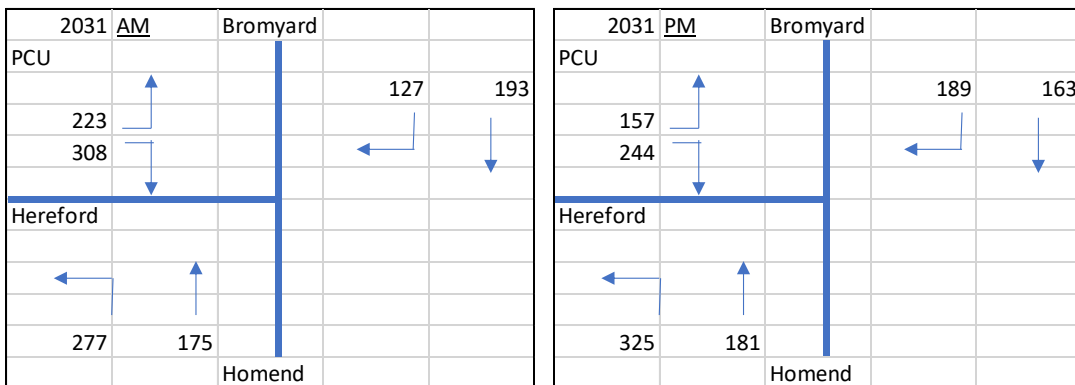
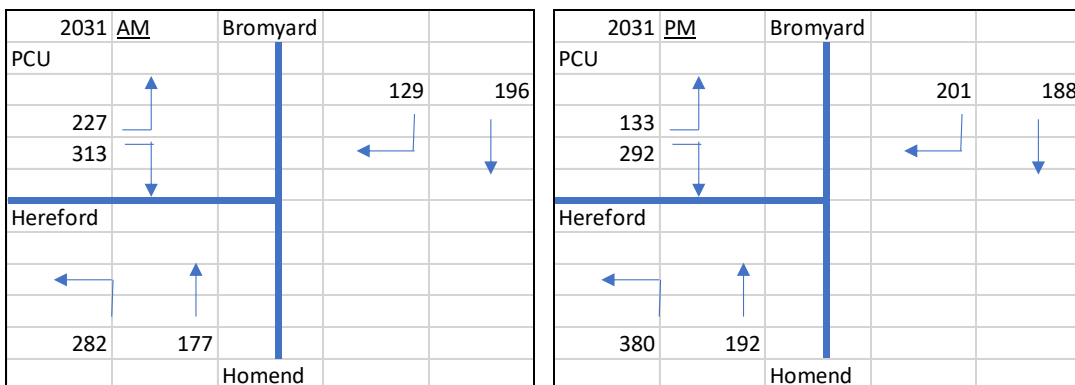


Figure 5 – 2031 Base Turning Movements – Connect Consultants’ Method



Proposed development vehicle trip rates

- 2.8.14 The PJA TA underestimates the weekday AM peak trip generation of the residential component of the proposed development. If the advice in the TRICS GPG is more closely followed, the resultant residential trip rates are significantly higher in the weekday AM peak, at 401 vehicle movements, than those used in the BWB and PJA TAs, at 318 vehicle movements.
- 2.8.15 The PJA TA assumes that 93% of the residential vehicle trips will travel through the junction of Bromyard Road / Hereford Road / The Homend, which comprises 55.7% via Hereford Road and 37.3% via The Homend.
- 2.8.16 These distribution proportions are applied to the Connect Consultants' residential trip numbers, shown in Table 1, to produce turning movements for the residential traffic as per the Connect Consultants method.
- 2.8.17 The PJA TA residential traffic turning movements are shown in Figure 6, alongside the Connect Consultants residential traffic turning movements, shown in Figure 7. The notably higher AM peak residential trip numbers are clearly evident in the latter.

Figure 6 – Residential Traffic Turning Movements Used in PJA TA

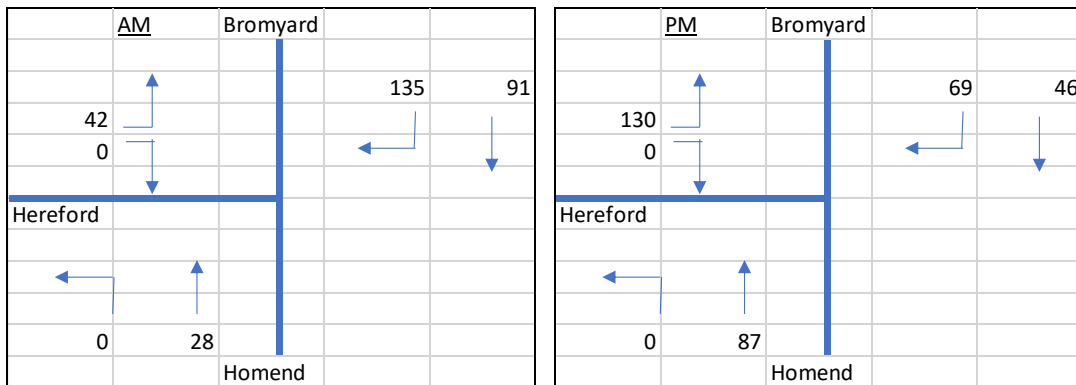
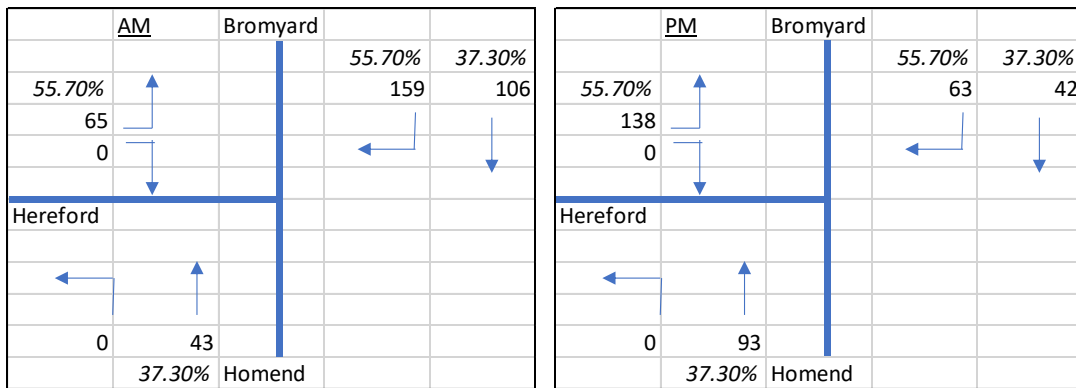


Figure 7 – Residential Traffic Turning Movements – Connect Consultants’ Method



Future Assessment Scenario (2031 base + committed + development) – CCL Method

2.8.18 The Connect Consultants’ version of the future assessment scenario at the junction of Bromyard Road / Hereford Road / The Homend, is produced by combining the constituent elements as follows:

Base flows: 15th September 2017 AM and PM traffic survey data

2031 base: 2017-2031 TEMPRO growth factors as per Connect Consultants method

Committed Developments: As per PJA TA

Proposed Employment: As per PJA TA

Proposed Residential: TRICS vehicle trip rates as per Connect Consultants method

2.8.19 As above, the PJA TA future assessment scenario AM and PM peak hour turning movements at the junction of Bromyard Road / Hereford Road / The Homend are shown in Figure 8, below which in Figure 9 are the equivalent but more realistic, representative and robust turning movements of the Connect Consultants method.

Figure 8 – 2031 base + Committed Development + Development – PJA TA

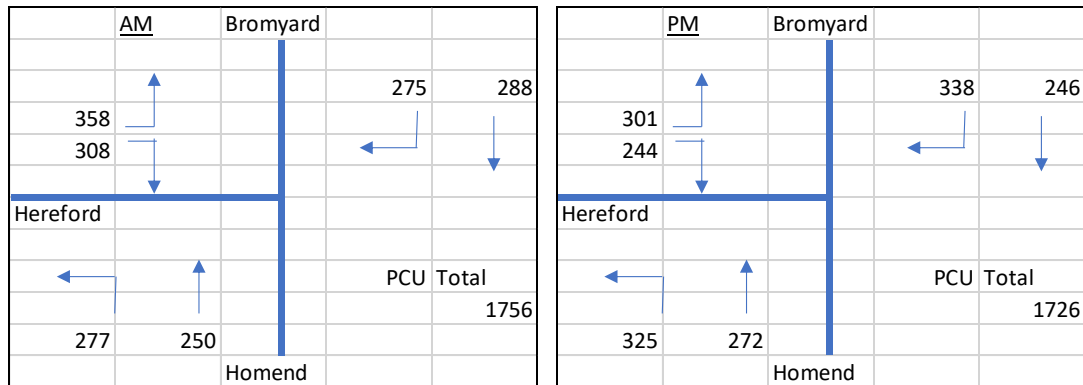
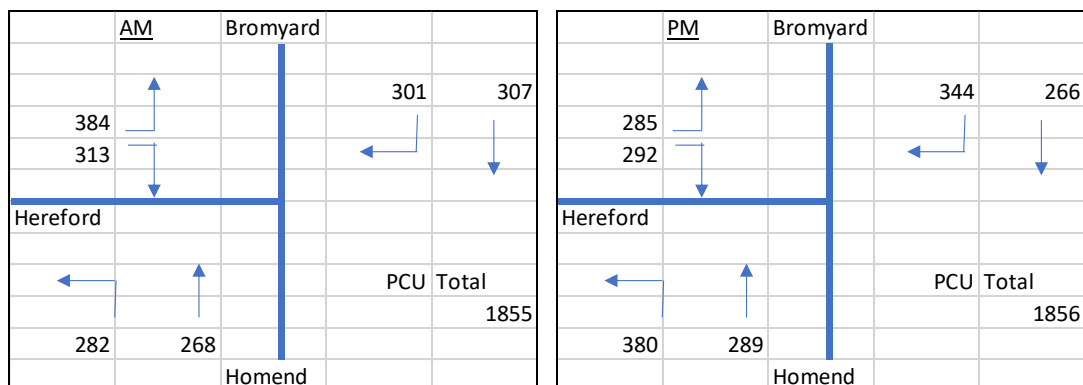


Figure 9 – 2031 base + Committed Development + Development – Connect Consultants' Method



2.8.20 The traffic flows shown in Figure 8 and Figure 9 illustrate the extent to which the PJA TA has underestimated the future assessment year traffic flows; by approximately 100 vehicles in the AM peak hour and 130 vehicles in the PM peak hour.

2.8.21 The operation and capacity of the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend must be tested based on the turning movements presented in Figure 9 in order for the proposed development's impact to be understood in a robust and realistic assessment. Graham Lee has undertaken junction capacity modelling on this basis, which is detailed in his evidence.

2.8.22 We have also provided Graham Lee with the Top Cross junction traffic flows, based on the Connect Consultants method (using the correct TEMPRO growth factors for 2017-2031, and using the correct residential trip rates).

Proposed development pedestrian trips

2.8.23 The development-related pedestrian trips must be taken into account in the proposed signal-controlled junction capacity assessment, and the likely increase in baseline pedestrian trips must also be taken into account.

2.8.24 PJA TA Chapter 9 sets out the details of the capacity assessment of the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend, supported by additional information in PJA TA Appendix G.

2.8.25 The predicted future demand of the pedestrian crossing is based upon pedestrian surveys undertaken on 25th October 2018.

2.8.26 The PJA TA states at paragraph 9.3.6;

"The pedestrian crossing would be called on-demand, which impacts on the capacity of the junction. The demand for the crossing has been calculated based upon pedestrian surveys in October 2018."

2.8.27 The pedestrian surveys were undertaken on the same date as the traffic surveys discussed in Section 2.2 of this evidence; in the week when most of the schools in England were on half-term, which casts serious doubt over the validity of the surveys.

2.8.28 PJA TA Appendix K 'Traffic Surveys' shows that the pedestrian surveys recorded 25 pedestrians crossing Bromyard Road in the AM peak hour, and 23 crossing in the PM hour.

2.8.29 The following paragraph 9.3.7 of the PJA TA states;

"The analysis, which is fully detailed within Appendix G, demonstrates that the pedestrian crossing would be called every three signal 'cycles' during the peak hours. As a sensitivity test, additional analysis is provided whereby the crossing is called every two cycles."

-
- 2.8.30 Notwithstanding the probability that the pedestrian surveys are not representative of normal conditions, no account has been made by PJA for the additional future pedestrian demand associated with the proposed development, nor the additional future demand that will likely arise from the proposed pedestrian infrastructure improvements and future trends towards sustainable travel.
- 2.8.31 PJA acknowledges that the 'calling' of the pedestrian crossing has a detrimental impact on the overall capacity of the junction, and at the same time, PJA also acknowledges that once every three cycles is potentially an underestimate by virtue of its additional test of once every two cycles.
- 2.8.32 Table 3 of this evidence shows that the proposed development will more than double the demand for the proposed pedestrian crossing, with 53 pedestrians in the AM peak hour and 40 in the PM peak hour.
- 2.8.33 PJA TA para 6.2.5 states that 13 of the future residents are expected to commute by rail in the weekday peak hours and are assumed to walk to the station. Six of the development's future employees are expected to travel by rail during the weekday peak hours.
- 2.8.34 This equates to 19 development-based pedestrian movements at the crossing in each of the AM and PM peak hours, which would likely align with scheduled train times and would likely reflect the survey data crossing times, arriving and departing the station approximately 10-15 minutes either side of the train times.
- 2.8.35 The remaining 34 development-related pedestrians in the AM and the remaining 21 in the PM peak would use the proposed crossing at times spread throughout the peak hours.
- 2.8.36 With a total of 78 pedestrians (25 observed + 53 development-related) using the crossing in the AM peak hour, and 63 (23 observed + 40 development-related) in the PM peak hour, in addition to the likely growth in the number of baseline pedestrian trips, it is entirely possible that the pedestrian crossing could be called every cycle during the peak hours.
- 2.8.37 In the interest of highway and pedestrian safety, and of good, resilient design, the proposed signal-controlled junction must be assessed with the pedestrian phase being called every cycle.
-

2.9 LinSig Modelling

2.9.1 Graham Lee has undertaken LinSig junction capacity modelling on behalf of Ledbury Town Council, which is based on the Connect Consultants future assessment scenario described in the previous sections of my evidence.

2.9.2 Graham Lee finds in his evidence that the Bromyard Road / Hereford Road / The Homend junction will be over capacity in the future assessment year with the proposed development traffic, reporting a Practical Reserve Capacity (PRC) of -41.2% in the AM peak and -45.1% in the PM peak, and concluding that the junction substantially fails to provide the capacity necessary to accommodate the forecast 2031 'with development' flows, with significant delays predicted on all approaches.

2.9.3 The Top Cross junction will also be over-capacity in 2031 with the proposed development traffic; Graham Lee reports a PRC of -25.6% in the AM peak and -31.5% in the PM peak.

2.9.4 The result of this is that some drivers may choose to avoid using the Bromyard Road / Hereford Road / The Homend junction and the route through the town, and instead reroute their journeys via rural lanes, which are unsuitable for significant numbers of additional vehicles.

2.9.5 This impact on the road network is contrary to 'Policy SS4: Movement and Transportation' of the Herefordshire Adopted Local Plan Core Strategy 2011-2031 (2015), which sets out that;

"New developments should be designed and located to minimise the impacts on the transport network; ensuring that journey times and the efficient and safe operation of the network are not detrimentally impacted."

2.9.6 It is also contrary to 'Policy MT1: Traffic Management, Highway Safety and Promoting Active Travel' of the same document, which includes the following criterion for development proposals:

"Demonstrate that the strategic and local highway network can absorb the traffic impacts of the development without adversely affecting the safe and efficient flow of traffic on the network or that traffic impacts can be managed to acceptable levels to reduce and mitigate any adverse impacts from the development."

2.10 Traffic Rerouting via Rural Lanes

- 2.10.1 The proposed signal-controlled junction and the Top Cross junction are predicted to be over capacity in the future assessment scenario, which is likely to displace some traffic on to rural lanes, as drivers seek to avoid the resultant delays through the town.
- 2.10.2 It is possible that some development traffic bound for the direction of Hereford will reroute via Rhea Lane, and traffic bound for Malvern / Worcester will reroute via Beggars Ash and the rural lanes through the Malvern Hills Area of Outstanding Natural Beauty (AONB), such as through Petty France.
- 2.10.3 While it is not possible to accurately quantify the number of trips that would reroute through the AONB due to the over-capacity signal junctions, it would be reasonable to assume that it could be in the region of 20%-40% of the development traffic which is predicted to travel to/from the east via the A449.
- 2.10.4 PJA TA Table 5-4 predicts that 24.4% of the proposed development's residential traffic will travel via the A449 (east) and that 2.7% will short-cut to the A449 (east) via Knapp Lane. This sums to 27.1% of the residential traffic.
- 2.10.5 PJA TA Table 5-5 predicts that 20.6% of the proposed development's employment traffic will travel via the A449 (east) and that 2.3% will short-cut to the A449 (east) via Knapp Lane. This sums to 22.9% of the employment traffic.
- 2.10.6 The 27.1% of the residential traffic and 22.9% of the employment traffic equates to 143 development trips in the AM peak and 125 trips in the PM peak travelling via the A449 (east), which would potentially be displaced by the junction delays through the town.
- 2.10.7 If 20% of this traffic reroutes via Beggars Ash and the rural AONB lanes, it would equate to an additional 29 trips in the AM peak and an additional 25 trips in the PM peak.
- 2.10.8 If 40% of this traffic reroutes via Beggars Ash and the rural AONB lanes, it would equate to an additional 57 trips in the AM peak and an additional 50 trips in the PM peak.
- 2.10.9 This would be in addition to the 22 trips (AM peak) and 19 trips (PM peak) which the PJA TA predicts will use Beggars Ash to travel to/from destinations within the Census area 'Herefordshire 009'.
- 2.10.10 To put this into context, the average daily traffic flow at Petty France is 493 vehicles per day (combined two-way flow), based on an average of four weeks of data collected

between 1st April and 12th May 2019 (excluding the two weeks of Easter school holidays and the May Bank Holiday) as part of the Malvern Hills AONB traffic monitoring programme.

2.10.11 The rerouting will likely only occur during the AM and PM peak-hour congestion, and not during the rest of the day; as such the daily number of additional (rerouted) trips through Petty France will likely be the sum of the AM and PM peak-hour rerouted trips, i.e. 54-107 additional daily trips through Petty France.

2.10.12 The potential rerouted development traffic would equate to an uplift of 11%-22% of the 2019 average daily traffic flow.

2.11 Beneficial Effect of a Second Access

2.11.1 If the proposed development was to provide an additional vehicle access to the south, connecting to the Hereford Road / Leadon Way roundabout, a significant proportion of the development traffic will not need to use the junction of Bromyard Road / Hereford Road / The Homend, thereby significantly reducing the development's impact on the junction, and reducing the likelihood of traffic rerouting via rural lanes.

2.11.2 It can be reasonably assumed that the second site access at the Hereford Road / Leadon Way roundabout will be used by all of the development traffic bound for the A438 Hereford Road and for the Ledbury Bypass / Leadon Way, and also traffic bound for the A417 (south) which will likely route via the Ledbury Bypass rather than through the town.

2.11.3 PJA TA Tables 5-4 and 5-5 show that 17.2% of the residential trips and 22.0% of the employment trips will be assigned to the A438 Hereford Road, 38.5% of the residential trips and 33.3% of the employment trips will be assigned to Leadon Way, and 10.2% of both the residential and employment traffic will be assigned to The Southend (for the A417 south).

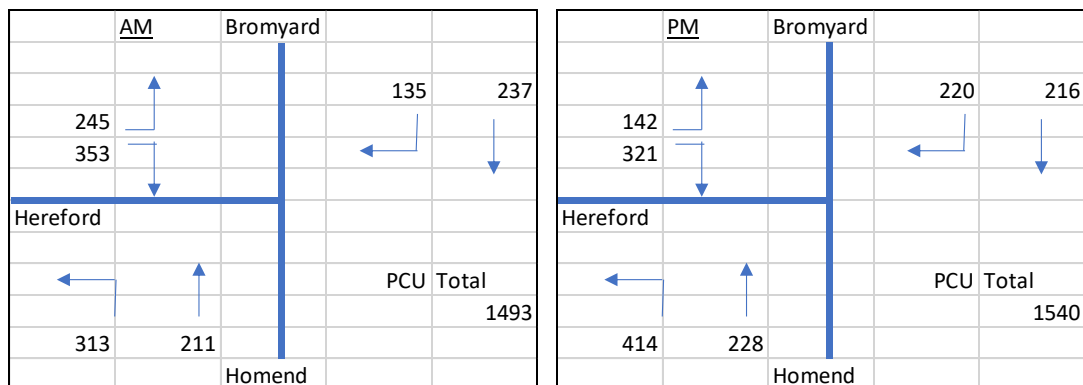
2.11.4 This sums to a total of 65.9% of the residential traffic and 65.5% of the employment traffic which would use the second access and not travel through the Bromyard Road / Hereford Road / The Homend junction.

2.11.5 In the AM peak, based on the Connect Consultants' method, this equates to 362 fewer trips (264 residential trips + 98 employment trips) through the Bromyard Road / Hereford

Road / The Homend junction; in the PM peak it equates to 316 fewer trips (238 residential trips + 78 employment trips).

- 2.11.6 The 10.2% of the development traffic (both residential and employment traffic) which is assigned in the PJA TA to The Southend (for the A417 south), would likely reroute via the second access and Ledbury Bypass, thereby avoiding the Top Cross junction. This equates to 56 fewer trips in the AM peak and 49 fewer trips in the PM peak at the Top Cross junction.
- 2.11.7 This scenario has been tested by Graham Lee using his LinSig models of the Bromyard Road / Hereford Road / The Homend junction and the Top Cross junction. For the purposes of this test, at the Bromyard Road / Hereford Road / The Homend junction the remaining development traffic assigned to The Homend (being traffic to/from the A449 Worcester Road) is assumed to be divided equally between the second access and the Bromyard Road access.
- 2.11.8 The resultant traffic turning movements at the Bromyard Road / Hereford Road / The Homend junction in the scenario with a second access are shown in Figure 10, which can be compared to the turning movements of the proposed development with a single access, shown in Figure 9.

Figure 10 - 2031 base + Committed Development + Development with Second Access – Connect Consultants’ Method



- 2.11.9 Graham Lee’s evidence reports the results of the two-access scenario, which show a PRC of +12.3% in the AM peak and +6.7% in the PM peak; the full results are provided in Graham Lee’s evidence. This shows a significant improvement from the -41.2% and -45.1% respectively in the scenario with a single access.

2.11.10 Similarly, at the Top Cross junction, Graham Lee's modelling of the two-access scenario shows a PRC of -22.5% in the AM peak and -27.9% in the PM peak, representing an improvement compared to the scenario with a single access.

2.11.11 In the two-access scenario, there will be less congestion and delay at the two signal junctions, and consequently there will be significantly less displacement of traffic on to rural lanes.

2.12 Section Summary

2.12.1 The PJA TA assessment of the proposed development at the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend in the future traffic scenario (2031 base + committed development + development) is found to be flawed, as follows:

2.12.2 The PM peak base traffic data from 25th October 2018 is likely not representative of normal conditions, and it recorded less traffic than the alternative data from 2017 which is more likely to represent normal conditions, resulting in less baseline traffic than the assessment should be based upon.

2.12.3 The TEMPRO growth factors which are used to forecast the 2031 assessment year traffic levels are calculated from incorrect assumptions, resulting in less traffic growth than the assessment should be based upon.

2.12.4 The 2017 base traffic data which is used in the AM peak scenario is multiplied by the TEMPRO growth rate for the wrong period, resulting in less growth to 2031 than the assessment should be based upon. The 2017 base traffic data should also have been used for the PM-peak assessment and it should have been multiplied by the correct TEMPRO growth factor.

2.12.5 The predicted traffic generation of the proposed residential development is derived from only a single site in the TRICS database, which is not an adequate sample, and which does not reflect the most appropriate site selection criteria or characteristics of the proposal site. The result is an underestimation of the likely trip generation of the proposed development.

2.12.6 Connect Consultants has produced its own calculation of the future assessment scenario, rectifying the flaws listed above, which shows that the PJA TA underestimates the future

traffic conditions at the Bromyard Road / Hereford Road / The Homend junction by approximately 100 vehicles in the AM peak hour and 130 vehicles in the PM peak hour.

2.12.7 Connect Consultants has also produced its own calculations of the future assessment scenario at the Top Cross junction.

2.12.8 The PJA TA computer modelling of the proposed signal-controlled junction underestimates the demand for the pedestrian crossing, assuming it is 'called' only once every three cycles of the traffic signals. Based on realistic future pedestrian demand, it is entirely possible that the crossing will be called every cycle, which will significantly impact on the throughflow of traffic and the ability of the junction to accommodate the traffic demand.

2.12.9 With the proposed single vehicular access to the development site on Bromyard Road, the proposed signal-controlled junction will receive the vast majority of the development traffic.

2.12.10 Graham Lee finds in his evidence that the Bromyard Road / Hereford Road / The Homend junction will be over capacity in the future assessment year with the proposed development traffic, reporting a Practical Reserve Capacity (PRC) of -41.2% in the AM peak and -45.1% in the PM peak, and concluding that the junction substantially fails to provide the capacity necessary to accommodate the forecast 2031 'with development' flows, with significant delays predicted on all approaches.

2.12.11 The Top Cross junction will also be over-capacity in 2031 with the proposed development traffic; Graham Lee reports a PRC of -25.6% in the AM peak and -31.5% in the PM peak.

2.12.12 The result of this is that a proportion of drivers, which could be in region of 54-107 vehicles in the peak hours, may choose to avoid using the junction, and instead reroute their journeys via rural lanes through the AONB, which are unsuitable for significant numbers of additional vehicles.

2.12.13 These harms must be considered in the context of the NPPF paragraph 109 which states;

"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe."

2.12.14 Further, the resultant impact on the road network is contrary to 'Policy SS4: Movement and Transportation' of the Herefordshire Adopted Local Plan Core Strategy 2011-2031 (2015), which sets out that;

"New developments should be designed and located to minimise the impacts on the transport network; ensuring that journey times and the efficient and safe operation of the network are not detrimentally impacted."

2.12.15 It is also contrary to 'Policy MT1: Traffic Management, Highway Safety and Promoting Active Travel' of the same document, which includes the following criterion for development proposals:

"Demonstrate that the strategic and local highway network can absorb the traffic impacts of the development without adversely affecting the safe and efficient flow of traffic on the network or that traffic impacts can be managed to acceptable levels to reduce and mitigate any adverse impacts from the development."

2.12.16 If the proposed development was to provide an additional vehicle access to the south, connecting to the Hereford Road / Leadon Way roundabout, a significant proportion of the development traffic will not need to use the junction of Bromyard Road / Hereford Road / The Homend, thereby significantly reducing the development's impact on the junction, and reducing the likelihood of traffic rerouting via rural lanes.

2.12.17 Graham Lee's evidence reports the results of the two-access scenario, which show a PRC at the junction of Bromyard Road / Hereford Road / The Homend of +12.3% in the AM peak and +6.7% in the PM peak. This shows a significant improvement from the -41.2% and -45.1% respectively in the scenario with a single access.

2.12.18 It is noteworthy that in the Appellant's Environmental Assessment, it is stated that the volume of traffic on the section of Hereford Road between the Bromyard Road / Hereford Road / The Homend junction and the Hereford Road / Leadon Way roundabout will increase by 31% under the proposal with a single vehicle access on Bromyard Road, only and 8% with an additional access off the Hereford Road / Leadon Way roundabout.

2.12.19 It also states that the volume of traffic on Bromyard Road between Beggars Ash and Hereford Road will increase by 77% under the proposal with a single access on Bromyard

Road, and only 16% with an additional access off the Hereford Road / Leadon Way
roundabout.

3.0 SUSTAINABLE TRANSPORT AND ACCESSIBILITY

3.1 National Planning Policy Framework Context

3.1.1 The National Planning Policy Framework, February 2019 (NPPF) paragraph 108 sets out that one of the key requirements in determining development proposals is that;

"b) safe and suitable access to the site can be achieved for all users;"

3.1.2 NPPF paragraph 110 states that applications for development should:

"a) give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;"

3.1.3 The first priority is therefore to ensure that the proposed development provides safe and suitable access for pedestrians, cyclists, and public transport users.

3.1.4 The proposed development includes three access points for pedestrians and cyclists:

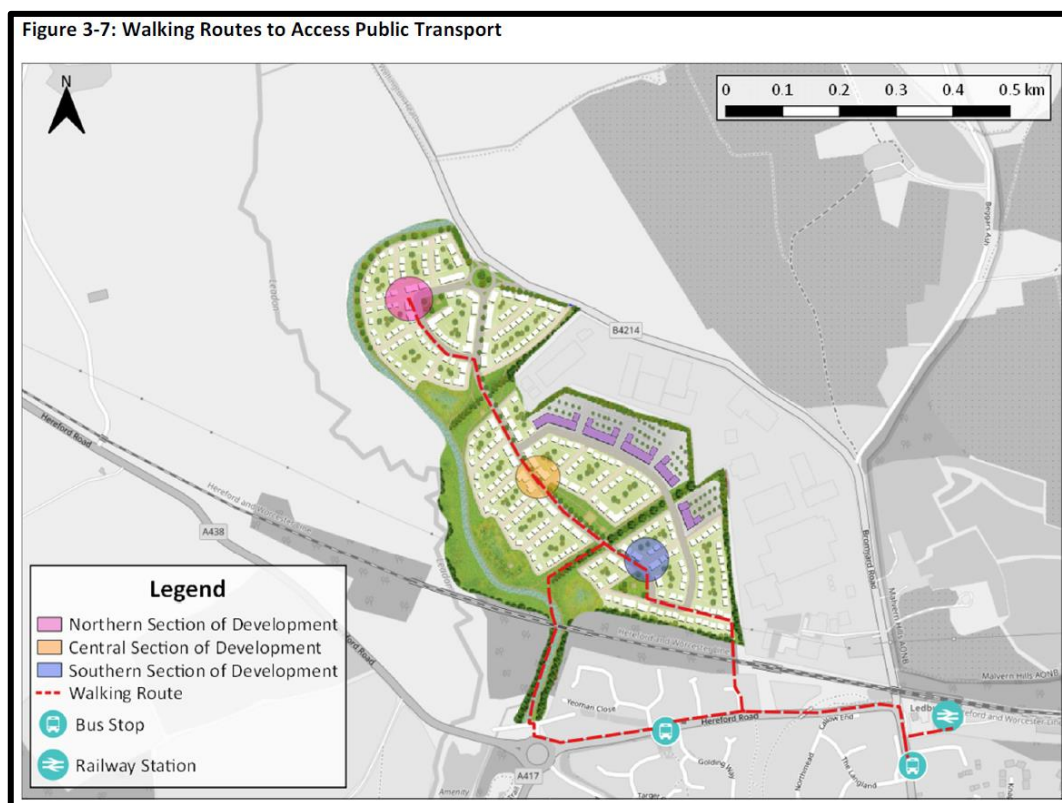
3.1.5 A 3m shared footway / cycleway to the north of the Hereford Road / Leadon Way roundabout, beneath the viaduct;

3.1.6 A shared footway / cycleway through Ballard Close beneath the viaduct. The route will be 3m wide, with local narrowing to 2m where constrained;

3.1.7 A separate pedestrian access via the emergency access onto Bromyard Road. This will connect to a new footway on Bromyard Road providing access to part of the Trading Estate.

3.1.8 The proposed pedestrian / cycle access routes, along with the nearest bus stops, are shown in PJA TA Figure 3-7, which is provided in Figure 11 below.

Figure 11 – Proposed Pedestrian and Cycle access routes – PJA TA Figure 3-7



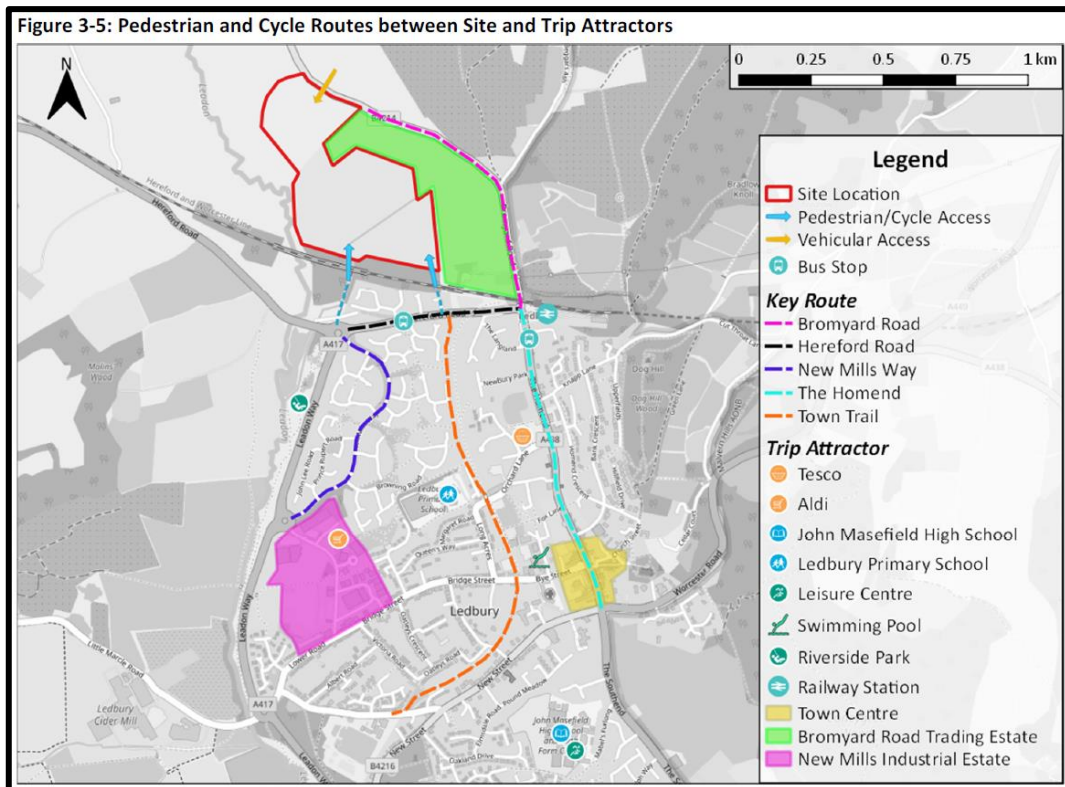
3.2 Access for Pedestrians

- 3.2.1 PJA TA Table 3-2, presented in Figure 12, below, lists a selection of local amenities alongside the respective walking distances from the development site; measured from three points within the site identified by the three coloured circles shown in Figure 11, and measured via the most direct of the three proposed access points.
- 3.2.2 The locations of the local amenities are shown in PJA TA Figure 3-5, presented in Figure 13 below.
- 3.2.3 I do not contest the stated walking distances, but it must be borne in mind that these are measured from three point-locations within the site, so in all cases there will be some residential units located further and some closer than the distances cited in the table.
- 3.2.4 It shows that some parts of the site are within the CIHT 'Guidelines for Providing for Journeys on Foot (2000)' preferred maximum 2km walking distances to the closest employment destinations, but this is not the case for all parts of the site.

Figure 12 – Walking Distance to Local Amenities – PJA TA Table 3-2

Destination	Distance from Point within Site (rounded to 50m)			Route Choice
	Southern	Central	Northern	
Ledbury Town Centre (Bye Street / The Homend Junction)	1550	1700	2100	The Homend (40m longer via Town Trail)
Bromyard Road Trading Estate (Beggar's Ash junction)	1050	1250	1600	Hereford Road East
New Mills Trading Estate	1600	1800	2150	New Mills Way
New Street (Co-op)	1700	1950	2300	Town Trail
Bye Street	1450	1650	2000	Town Trail
Tesco	1100	1350	1650	The Homend
Ledbury Primary School	1100	1300	1650	Town Trail
John Masefield High School	2050	2300	2600	Town Trail
Ledbury Swimming Pool	1550	1750	2100	Town Trail
Ledbury Leisure Centre	2100	2300	2650	Town Trail
Riverside Park	550	750	1100	Hereford Road West

Figure 13 – Routes to Local Amenities – PJA TA Figure 3-5



-
- 3.2.5 PJA states at paragraph 3.7.5 that, "*pedestrian journeys of more than 2km are often undertaken*"; however, this typically the case only for fit, able-bodied, motivated walkers; not the majority.
- 3.2.6 At PJA TA paragraph 3.7.7 it concludes that "*the site is accessible on foot for commuting journeys*", however, by virtue of the walking distances, the site's level of pedestrian accessibility will be significantly limited by poor weather conditions and the dark winter months.
- 3.2.7 This point is especially pertinent with regard to the pedestrian routes on the site's south side, which have no natural surveillance and which we understand will not be lit. These routes will potentially be perceived as intimidating, especially to vulnerable people, and will likely be an unattractive option to many users.
- 3.2.8 Paragraph 4.6.3 of the Department for Transport's document 'Manual for Streets' (2007) (Core Document CD1.51) refers to the ODMP and Home Office document 'Safer Places', stating:
- "Cars, cyclists and pedestrians should be kept together if the route is over any significant length – there should be a presumption against routes serving only pedestrians and/or cyclists away from the road unless they are wide, open, short and overlooked."*
- 3.2.9 The same principle of safety through natural surveillance is echoed in the Herefordshire Council 'Highways Design Guide for New Developments' (2006).
- 3.2.10 The proposed pedestrian routes on the site's south side are not wide, open, short, nor overlooked, and are therefore contrary to the Manual for Streets and Herefordshire Council guidance.
- 3.2.11 With regard to walking to school, while the site is within the CIHT preferred maximum 2km walking distance of Ledbury Primary School, it is more than 2km from John Masefield High School.
- 3.2.12 Typically, primary school parents tend to accompany their children on the school journey, while older schoolchildren are more likely to be unaccompanied by parents.
- 3.2.13 In the case of this proposed development, as with commuting journeys, by virtue of the walking distances and the unlit and un-overlooked pedestrian routes on the site's south
-

side, the likelihood of parents allowing children to walk unaccompanied to school will be significantly limited, especially in poor weather conditions and the dark winter months.

3.3 Access for Cyclists

- 3.3.1 While much of Ledbury and the local amenities are within cycling distance from all parts of the proposed development, the main cycle routes to/from the development are via the proposed shared-use pedestrian/cycle links beneath the viaduct on the southern side of the site.
- 3.3.2 As with pedestrian accessibility, the attractiveness of these unlit and un-overlooked routes under the railway will be limited, especially in the dark winter months.
- 3.3.3 The proposed Bromyard Road access is an alternative option for cyclists, however, Bromyard Road is unlikely to be perceived as an attractive cycling route by the majority of people, on account that it is a relatively high-speed road, without street lights.

3.4 Access by Bus

- 3.4.1 The publication 'Planning for Public Transport in Developments' produced by the Institution of Highways and Transportation (IHT) specifies that new developments should be located within 400m of the nearest bus stop.
- 3.4.2 PJA TA paragraph 3.8.4 identifies that the only main bus service in the vicinity of the proposed development is the 476 service, which runs hourly throughout the day, between Ledbury and Hereford.
- 3.4.3 The closest bus stops for this service is on Hereford Road, 550m from the southern part of the site and 1,150m from the northern part of the site (shown in Figure 11); significantly further than the 400m specified by the IHT.
- 3.4.4 Furthermore, the walk routes to the Hereford Road bus stops are via the pedestrian routes beneath the viaduct, which will reduce the attractiveness of bus travel for many of the future residents and employees.

3.5 Safe and Suitable Access for All Users

- 3.5.1 On the basis of the proposed development access arrangements and the site's distance from the local amenities and destinations, the level of safe and suitable access for all users is limited.
- 3.5.2 At the time of writing this proof of evidence the precise details of any mitigation measures to be delivered through a Section 106 agreement are not fully understood.
- 3.5.3 Many of the pedestrian routes to amenities are further than guideline maximum distances, as are the walking routes to the nearest bus stops, which are served by limited bus services. The proposed shared-use pedestrian and cycle routes beneath the viaduct will likely be perceived as unsafe and unattractive to many users, especially in poor weather and dark conditions.
- 3.5.4 In the context of the NPPF, the proposed development cannot be considered to provide safe and suitable access for all users.
- 3.5.5 If an additional full access were to be provided via the Hereford Road / Leadon Way roundabout, the quality and attractiveness of pedestrian and particularly cycle access would be improved, and it could be possible to extend or divert bus routes from Hereford Road to new stop/s within the site. An additional full access would also provide an additional pedestrian/cycle access with natural surveillance.

3.6 Dymock Road Appeal

- 3.6.1 A recent Planning Inspectorate appeal decision, dated 1st November 2019, dismissed a proposed residential development for up to 420 homes at Dymock Road, Ledbury (planning reference 184032; appeal reference APP/W1850/W/19/3225309), finding that the site is not in an accessible location.
- 3.6.2 The distance of the Dymock Road site to the main town centre area of Ledbury is comparable to that of the Viaduct appeal site.
- 3.6.3 The Appeal Report is provided as Core Document CD11.32.
- 3.6.4 The Inspector notes at paragraph 38 of the Appeal Decision that the Dymock Road site is some 1.6-2.5 km away from a number of key facilities and amenities, but also acknowledged that by virtue of the size of the site, some residents would be much further away.

3.6.5 At paragraph 39, the Inspector gives consideration to the IHT recommended walking distances, and gives weight to the fact that the Dymock Road site exceeds the maximum recommended walking distances:

"39. These distances exceed the CIHT7 'desirable' 400 m walking distance (200 m for town centres and 500 m for schools) and the 'acceptable' maximum walk distance of 800 m (400 m for town centres and 1 km for schools) with most also exceeding the recommended 'preferred' maximum walking distance of 1.2 km (800 m for town centres and 2 km for schools)."

3.6.6 The Inspector also acknowledges in paragraph 40 that the Department for Transport's document 'Manual for Streets' seeks to encourage 'walkable neighbourhoods' with a range of facilities and amenities within ten-minutes' walk (c.800m) of residential areas:

"40. Whilst the Government's Manual for Streets (MfS) advises that walking offers the greatest potential to replace short car trips, particularly those under 2 km, it also sets out that walkable neighbourhoods are typically characterised by having a range of facilities within ten minutes walking distance of residential areas (up to about 800m). Furthermore, MfS encourages a reduction in the need to travel by car through the creation of mixed use neighbourhoods with interconnected street patterns where daily needs are in walking distance of most residents which, based on the evidence before me, would not be achieved by the appeal proposal."

3.6.7 The Inspector's observations of the Dymock Road site, above, are equally applicable to this proposed development site, however, later in the Appeal Decision, as paragraph 53, the Inspector compares the Dymock Road site to the Viaduct site and acknowledges that, "*[the Viaduct site] would be closer to the primary school, food shops and the High Street, railway station than the appeal site and a similar distance to the health centre.*"

3.6.8 Similarly to the appeal site, the Dymock Road site is more than 400m to the nearest bus stops, and the range and frequency of bus services is limited. At paragraph 45 of the Appeal Decision, the Inspector states;

"...although I accept that there may be some residents willing and able to use local bus services, particularly those to the north of the appeal site, I consider

that it would be a low proportion of residents. It seems to me that the opportunity to substitute walking or buses in place of car use is limited on this site."

- 3.6.9 Again, this could be equally applicable to the appeal site with the proposed single access off Bromyard Road.
- 3.6.10 However, as set out in paragraph 3.5.5, if an additional full access to the proposed development was to be provided via the Hereford Road / Leadon Way roundabout, the quality and attractiveness of pedestrian and cycle access would be improved, and it could be possible to extend or divert bus routes from Hereford Road to new stop/s within the site, thereby addressing the substandard sustainable access of the proposed development.

4.0 PROOF OF EVIDENCE SUMMARY

4.1 Summary

I am Nicholas Bradshaw, a Director and the Principal of Connect Consultants, I am a member of the Chartered Institute of Logistics and Transport and the Chartered Institution of Highways and Transportation, and have approximately 30 years' experience in the disciplines of highway engineering, traffic and transport planning.

- 4.1.1 The PJA TA assessment of the proposed development at the proposed signal-controlled junction of Bromyard Road / Hereford Road / The Homend in the future traffic scenario (2031 base + committed development + development) is found to be flawed, as follows:
- 4.1.2 The PM peak base traffic data is from a survey on 25th October 2018, which is likely not representative of normal conditions. The 2018 survey recorded less traffic through the junction than the available alternative survey data from 2017, which is more likely to represent normal conditions. The result of this is less baseline traffic in the assessment that it should be based upon.
- 4.1.3 The TEMPRO growth factors which are used to forecast the 2031 assessment year traffic levels are calculated from incorrect assumptions, resulting in less traffic growth than the assessment should be based upon.
- 4.1.4 The 2017 base traffic data which is used in the AM peak scenario is multiplied by the TEMPRO growth rate for the wrong period, resulting in less growth to 2031 than the assessment should be based upon. The 2017 base traffic data should also have been used for the PM-peak assessment and it should have been multiplied by the correct TEMPRO growth factor.
- 4.1.5 The predicted traffic generation of the proposed residential development is derived from only a single site in the TRICS database, which is not an adequate sample, and which does not reflect the most appropriate site selection criteria or characteristics of the proposal site. The result is an underestimation of the likely trip generation of the proposed development.
- 4.1.6 Connect Consultants has produced its own calculation of the future assessment scenario, rectifying the flaws listed above, which shows that the PJA TA underestimates the future

traffic conditions at the Bromyard Road / Hereford Road / The Homend junction by approximately 100 vehicles in the AM peak hour and 130 vehicles in the PM peak hour.

4.1.7 The differences between the PJA TA and the Connect Consultants method are summarised in Table 5, along with the resultant outcomes in terms of traffic movements through the Bromyard Road / Hereford Road / The Homend junction.

Table 5 – Summary of Input Data Changes by Connect Consultants

Input Data / Assumptions	PJA TA	Connect Consultants
Base Traffic Data at Bromyard Road / Hereford Road / The Homend	AM peak hour: Friday 15 th September 2017 PM peak hour: Thursday 25 th October 2018 <u>Outcome:</u> 1,180 PCUs in AM peak 1,144 PCUs in PM peak	AM and PM peak hours: Friday 15 th September 2017 <u>Outcome:</u> 1,180 PCUs in AM peak 1,241 PCUs in PM peak
TEMPRO growth	AM peak: growth from 2018 to 2031 = 1.1050 growth applied to 2017 survey data. PM Peak: growth from 2018 to 2031 = 1.0995 growth applied to 2018 survey data. <u>Outcome:</u> 2031 base AM: 1,303 PCUs 2031 base PM: 1,259 PCUs	AM peak: growth from 2017 to 2031 = 1.1225 growth applied to 2017 survey data. PM peak: growth from 2017 to 2031 = 1.1162 growth applied to 2017 survey data. <u>Outcome:</u> 2031 base AM: 1,324 PCUs 2031 base PM: 1,386 PCUs
Residential traffic generation	TRICS data from a single sample site. <u>Outcome:</u> AM peak = 318 vehicle movements PM peak = 357 vehicle movements	Following TRICS Good Practice Guide: <u>Outcome:</u> AM peak = 401 vehicle movements PM peak = 361 vehicle movements
Resultant total traffic through Bromyard Road / Hereford Road / The Homend junction	2031 + Committed Developments + Proposed Development: AM peak: 1,756 PM peak: 1,726	2031 + Committed Developments + Proposed Development: AM peak: 1,855 PM peak: 1,856

-
- 4.1.8 The PJA computer modelling of the proposed signal-controlled junction underestimates the demand for the pedestrian crossing, assuming it is 'called' only once every three cycles of the traffic signals. Based on realistic future pedestrian demand, it is entirely possible that the crossing will be called every cycle, which will significantly impact on the throughflow of traffic and the ability of the junction to accommodate the traffic demand.
- 4.1.9 With the proposed single vehicular access to the development site on Bromyard Road, the proposed signal-controlled junction will receive the vast majority of the development traffic.
- 4.1.10 Graham Lee finds in his evidence that the Bromyard Road / Hereford Road / The Homend junction will be over capacity in the future assessment year with the proposed development traffic, reporting a Practical Reserve Capacity (PRC) of -41.2% in the AM peak and -45.1% in the PM peak, and concluding that the junction substantially fails to provide the capacity necessary to accommodate the forecast 2031 'with development' flows, with significant delays predicted on all approaches.
- 4.1.11 The Top Cross junction will also be over-capacity in 2031 with the proposed development traffic; Graham Lee reports a PRC of -25.6% in the AM peak and -31.5% in the PM peak.
- 4.1.12 The result of this is that a proportion of drivers, which could be in region of 54-107 vehicles in the peak hours, may choose to avoid using the Bromyard Road / Hereford Road / The Homend junction and the route through the town, and instead reroute their journeys via rural lanes through the AONB, which may be unsuitable for significant numbers of additional vehicles.
- 4.1.13 This impact on the road network is contrary to 'Policy SS4: Movement and Transportation' of the Herefordshire Adopted Local Plan Core Strategy 2011-2031 (2015), which sets out that;

"New developments should be designed and located to minimise the impacts on the transport network; ensuring that journey times and the efficient and safe operation of the network are not detrimentally impacted."

4.1.14 It is also contrary to 'Policy MT1: Traffic Management, Highway Safety and Promoting Active Travel' of the same document, which includes the following criterion for development proposals:

"Demonstrate that the strategic and local highway network can absorb the traffic impacts of the development without adversely affecting the safe and efficient flow of traffic on the network or that traffic impacts can be managed to acceptable levels to reduce and mitigate any adverse impacts from the development."

4.1.15 If the proposed development was to provide an additional vehicle access to the south, connecting to the Hereford Road / Leadon Way roundabout, a significant proportion of the development traffic will not need to use the junction of Bromyard Road / Hereford Road / The Homend, thereby significantly reducing the development's impact on the junction, and reducing the likelihood of traffic rerouting via rural lanes.

4.1.16 Graham Lee's evidence reports the results of the two-access scenario, which show a PRC of +12.3% in the AM peak and +6.7% in the PM peak at the Bromyard Road / Hereford Road / The Homend junction. This shows a significant improvement from the -41.2% and -45.1% respectively in the scenario with a single access.

4.1.17 Similarly, at the Top Cross junction, Graham Lee's modelling of the two-access scenario shows a PRC of -22.5% in the AM peak and -27.9% in the PM peak, representing an improvement compared to the scenario with a single access.

4.1.18 The proposed development fails to meet the NPPF requirement to provide safe and suitable access for all users.

4.1.19 On the basis of the proposed development access arrangements and the site's distance from the local amenities and destinations, the level of safe and suitable access for all users is limited.

4.1.20 Many of the pedestrian routes to amenities are further than guideline maximum distances, as are the walking routes to the nearest bus stops, which are served by limited bus services. The proposed shared-use pedestrian and cycle routes beneath the viaduct are unlit, and will likely be perceived as unsafe and unattractive by many users, especially in poor weather and dark conditions.

4.1.21 In the context of the NPPF, the proposed development cannot be considered to provide safe and suitable access for all users.

4.1.22 However, if an additional full access were to be provided via the Hereford Road / Leadon Way roundabout, the quality and attractiveness of pedestrian and particularly cycle access would be improved, and it could be possible to extend or divert buses from Hereford Road to new stop/s within the site, thereby addressing the substandard sustainable access of the proposed development.

4.2 Conclusion

4.2.1 The proposed development will result in an unacceptable highway safety impact and a residual cumulative impact on the road network which would be severe.

4.2.2 The proposed development does not provide safe and suitable access for all users.

4.2.3 Both of the above failings could be resolved if the proposed development were to provide an additional full access on its south side, via the Hereford Road / Leadon Way roundabout. This would remove much of the development traffic from the junction of Bromyard Road / Hereford Road / The Homend, the quality and attractiveness of pedestrian and cycle access would be improved, and it could be possible to extend or divert buses from Hereford Road to new stop/s within the site.

APPENDICES

APPENDIX NPB/01 – TRICS OUTPUT FILES

Calculation Reference: AUDIT-142301-200429-0411

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
 Category : A - HOUSES PRIVATELY OWNED
 VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	KC KENT	1 days
	WS WEST SUSSEX	1 days
04	EAST ANGLIA	
	CA CAMBRIDGESHIRE	1 days
	NF NORFOLK	2 days

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

Primary Filtering 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: No of Dwellings
 Actual Range: 207 to 799 (units:)
 Range Selected by User: 200 to 1200 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/12 to 24/09/19

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
Thursday	1 days
Friday	2 days

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

Selected survey types:

Manual count	4 days
Directional ATC Count	1 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	4
Neighbourhood Centre (PPS6 Local Centre)	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:

Residential Zone	3
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.

Secondary Filtering selection:

Use Class:

C3 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 2 days
5,001 to 10,000 3 days

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

Population within 5 miles:

25,001 to 50,000 1 days
50,001 to 75,000 2 days
75,001 to 100,000 2 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:

Yes 3 days
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.

PTAL Rating:

No PTAL Present 5 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1	CA-03-A-06 CRAFT'S WAY NEAR CAMBRIDGE BAR HILL Neighbourhood Centre (PPS6 Local Centre) Village	MIXED HOUSES	CAMBRI D G E S H I R E
	Total No of Dwellings:	207	
	Survey date: <i>FRIDAY</i>	<i>22/06/18</i>	Survey Type: <i>MANUAL</i>
2	KC-03-A-07 RECVLVER ROAD HERNE BAY	MIXED HOUSES	KENT
	Edge of Town Residential Zone		
	Total No of Dwellings:	288	
	Survey date: <i>WEDNESDAY</i>	<i>27/09/17</i>	Survey Type: <i>MANUAL</i>
3	NF-03-A-06 BEAUFORT WAY GREAT YARMOUTH BRADWELL	MIXED HOUSES	NORFOLK
	Edge of Town Residential Zone		
	Total No of Dwellings:	275	
	Survey date: <i>MONDAY</i>	<i>23/09/19</i>	Survey Type: <i>MANUAL</i>
4	NF-03-A-07 SILFIELD ROAD WYMONDHAM	MIXED HOUSES & FLATS	NORFOLK
	Edge of Town Out of Town		
	Total No of Dwellings:	297	
	Survey date: <i>FRIDAY</i>	<i>20/09/19</i>	Survey Type: <i>DIRECTIONAL ATC COUNT</i>
5	WS-03-A-06 ELLIS ROAD WEST HORSHAM S BROADBRIDGE HEATH	MIXED HOUSES	WEST SUSSEX
	Edge of Town Residential Zone		
	Total No of Dwellings:	799	
	Survey date: <i>THURSDAY</i>	<i>02/03/17</i>	Survey Type: <i>MANUAL</i>

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 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	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	5	373	0.108	5	373	0.354	5	373	0.462
08:00 - 09:00	5	373	0.186	5	373	0.456	5	373	0.642
09:00 - 10:00	5	373	0.175	5	373	0.209	5	373	0.384
10:00 - 11:00	5	373	0.126	5	373	0.155	5	373	0.281
11:00 - 12:00	5	373	0.146	5	373	0.166	5	373	0.312
12:00 - 13:00	5	373	0.172	5	373	0.167	5	373	0.339
13:00 - 14:00	5	373	0.171	5	373	0.169	5	373	0.340
14:00 - 15:00	5	373	0.168	5	373	0.210	5	373	0.378
15:00 - 16:00	5	373	0.318	5	373	0.190	5	373	0.508
16:00 - 17:00	5	373	0.327	5	373	0.179	5	373	0.506
17:00 - 18:00	5	373	0.397	5	373	0.180	5	373	0.577
18:00 - 19:00	5	373	0.355	5	373	0.215	5	373	0.570
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.649			2.650			5.299

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.

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Parameter summary

Trip rate parameter range selected: 207 - 799 (units:)
Survey date range: 01/01/12 - 24/09/19
Number of weekdays (Monday-Friday): 9
Number of Saturdays: 0
Number of Sundays: 0
Surveys automatically removed from selection: 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.