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**PROPOSED RESIDENTIAL DEVELOPMENT
LAND EAST OF BEDFORD ROAD, LOWER STONDON
(NORTH HERTFORDSHIRE LOCAL PLAN SITE LS1)**

ASSESSMENT OF LOCAL TRANSPORT IMPLICATIONS

BY

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REPORT SUMMARY

The report has identified in the developer's Transport Assessment for the proposed LS1 site development a number of errors, omissions and failures to comply with local and national planning policy, as summarised below:

- **Location and policy context:** LS1 site is located outside any defined settlement boundary. It is therefore contrary to NHLP policy SP2.
- **Sustainability and access to local facilities:** Exaggeration of usefulness and attraction of local shopping and other facilities, and of attractiveness of non-car travel to those facilities; thereby understating the likely propensity of residents of this development to drive to other towns.
- **Sustainability and cycling facilities:** Failure to explicitly acknowledge the current complete lack of any cycle facilities in the area. Failure to propose any measures to rectify that serious deficiency in provision for sustainable travel.
- **Background traffic growth:** Narrow focus on a small, selected portion of the area, mainly in the north around the villages of Meppershall and Clifton rather than the entire study area. The exclusion of several other villages in the local area has resulted in a significant under-statement of likely traffic growth.
- **Committed developments:** Failure to undertake a full analysis of all the committed developments in the local area thus omitting to evaluate the cumulative impact on transport infrastructure of all cross-border developments when considered in conjunction with the proposed LS1 development of 185 dwellings.
- **Future Design Assessment Year:** Failure to assess for an adequate number of years following likely year of completion and full occupation of the development
- **Trip Rates:** Underestimation of the likely car trip rates per dwelling through use of inappropriate TRICS comparator data from urban residential developments rather than comparable edge-of-village or out-of-village developments. Lack of comparability in data invalidates figures for car trips.
- **Development traffic distribution and Assignment to the road traffic network:** Dubious development traffic distribution and assignment basis, which conflicts with the actual existing pattern of traffic movement in the area. Focus on North/South traffic flows at Bird in Hand roundabout, for example, that ignores significant East/West flows to/from Lower Stondon and Henlow. Compounded by the failure to carry out sensitivity tests on the capacity impact on assessed road junctions with alternative traffic assignment scenarios. Instead, a single derived traffic assignment pattern has been used.
- **Assessment of network and junction capacity:**
 - Failure to assess foreseeable future traffic growth at the key A600/ Turnpike Lane mini roundabout at Ickleford, already operating at or near full capacity, In particular, the failure to assess the impact of the new access road onto the A600 to be created for the proposed IC3 site of 150 dwellings. Notwithstanding the potential for S106

payments, the proximity of adjacent housing will impose constraints on mitigation measures. In their Consultee Response dated 10th October 2017 HCC state:-

“The junction modelling contained in the TA indicates that the proposed development will have an impact on the above junction. The applicant will need to provide further justification that the impact of the additional vehicles generated by the proposed development on this particular junction can be considered acceptable.”

This stipulation is based on the impact of only the 185 dwelling LS1 development alone, without taking into account the 603 other permitted developments in the area to date, quite apart from those applications which have been submitted awaiting decision, those which are imminent and those which have been proposed in the CBC and N Herts draft local plans, let alone the impact of dwellings from the re-development of the huge RAF Henlow Camp site, scheduled to close in 2020.

The HCC report concludes:-

“The analysis in the TA indicates that the additional vehicle trips generated by the proposed development will have a significant impact on the min-roundabout at Ickleford.”

- Serious discrepancies between LS1 site TA assessment and prior Welbeck site TA assessment of the existing capacities and future capacity impacts at the ‘Bird in Hand’ and ‘Airman’ roundabouts on the A600; the LS1 TA assessment apparently overestimating the capacities and understating the development impact at these junctions compared to the Welbeck TA assessment which indicated serious problems at both junctions even without the LS1 development.
- Failure to include the A507/A6001 roundabout junction near The Crown in the assessment, despite a significant proportion of the development traffic having been routed via the A6001 and hence through that junction.
- **Access location and design:** The further speed limit reduction to 30 mph on the A600 main road suggested in conjunction with the Barratts development is unlikely to be a realistic proposition or an acceptable one to the highway authority (let alone the police) unless and until traffic calming and/or enforcement measures succeed in producing reasonable compliance with the existing 40 mph limit. In their Consultee Response HCC state:-

“The viability of the proposed site access is dependent on the speed limit being lowered to 30mph. However, the applicant has not provided adequate justification that lowering the speed limit would be consistent with the HCC Speed Management Strategy....The applicant has not demonstrated that safe vehicle access to the site from Bedford Road is achievable.”

- **Other limitations on traffic:** Failure to consider the cumulative impact of traffic on the A600 to avoid infringing the 10,000 vehicle per day limit set by CBC in relation to the operation of the MBDA Defence site which handles hazardous materials .Given the volume of traffic generated, it is conceivable this daily total could well be exceeded, thereby impairing the activities of this vital established business. This would be contrary to the NPPF, as Central Bedfordshire Council has stated.
- **Overview:** Given the above serious concerns regarding transport matters, it is debatable whether an informed evaluation of the proposed LS1 development can be made. Any decision would currently have to be made on the basis of incomplete, as well as inaccurate data in some important respects. In particular, the failure to consider the cumulative impact of other developments and the failure to consider the cross-border implications on transport infrastructure of these developments is of serious concern.

1 INTRODUCTION

- 1.1 Transport and Traffic Consultancy have been engaged to examine and report on the transport related implications of the proposed scheme for a development of 185 dwellings on a greenfield site (proposed allocation site LS1 in the Draft North Hertfordshire Local Plan (NHLP)) on the east side of the A600 Bedford Road south of Henlow Camp settlement. The scheme is the subject of a current planning application to North Hertfordshire District Council (case ref no: 17/02175/1).

2 LOCATION AND POLICY CONTEXT

- 2.1 The site is located adjacent to the Central Bedfordshire and North Herts District/ Herts County boundary, entirely in Hertfordshire, not 'on' the boundary (TS para 1.1).
- 2.2 The site is clearly not in any defined settlement boundary. By no stretch of the imagination can it be said to be within the Lower Stondon village boundary (TS para 2.3.4 – 2.3.5). The development is therefore contrary to NHLP policy SP2.

3 SUSTAINABILITY AND ACCESS TO LOCAL FACILITIES

- 3.1 The assertion in the developer's Transport Assessment (TA) that ***The proposed development is located where the need to travel will be minimised*** is clearly implausible. Whatever other arguable virtues this site may potentially have for residential development, minimising the need to travel is certainly not one of them.
- 3.2 The nearest small shop (currently closed for rebuilding) at the Cornwall garage on Bedford Road is 12 minutes walk away. All the limited range of other local facilities are based around the Bird In Hand pub roundabout on the A600 a quarter of an hour walk away - two small convenience shops, a small pharmacy-cum-post-office, a large pub, a small cafe, three small hot food takeaway shops, three hairdressers and a second hand bric-a-brac shop.
- 3.3 This nondescript combination of range, quality and proximity of facilities is likely to dissuade most adult residents of this development from driving to those limited facilities. They would probably prefer to drive to Hitchin 4 miles south where there is a full range of facilities including several large supermarkets, banks and other essential facilities.

4 SUSTAINABILITY AND CYCLING FACILITIES

- 4.1 In addition the alternative of cycling to the local facilities is unlikely to prove an attractive option for many residents. There are no on-road or off-road cycle route facilities of any sort anywhere in or around Henlow Camp (as tacitly admitted in Section 3.3 of the TA and corresponding Section 4.2 of the TP, where the word 'cycling' appears only in the section title with not even a single mention in the text under the title) and there are no proposals in either

the TA or the TP to provide or contribute to the provision of any such facilities, contrary to NHLP policies T1 and SP7.

- 4.2 Cycling to the limited facilities centred around the Bird In Hand roundabout on the A600 or indeed anywhere else from this development would thus involve cycling on the carriageways of the busy A600 and other main roads, which would be both unpleasant and potentially hazardous, particularly through the inherently cyclist-unfriendly roundabouts. Significantly, a third of the recorded personal injury accidents mentioned in the TS involved cyclists.

5 BACKGROUND TRAFFIC GROWTH

- 5.1 Traffic growth factors for the Central Bedfordshire 013 MSOA appear to be stated in the developer's TA as allowing for 300 new dwellings. However, it is not made clear that this figure covers the approved and forthcoming committed housing developments only within a small, northern portion of the study area that includes for example the villages of Clifton and Meppershall. The TA thus appears to misrepresent this 300 new dwellings allowance as covering the entire study area, whereas it in fact covers only a small part of the study area, mostly to the north of the LS1 site.
- 5.2 In reality, over 300 additional new dwellings have already been approved in the other neighbouring villages which have been excluded from the developer's TA, such as Henlow Camp, Lower Stondon, Pirton and Ickleford, the last two being in North Herts MSOA 014. This total of over 600 new dwellings is quite apart from the substantial number of dwellings in applications which have been submitted, or are imminent and proposed, as detailed in paras 6.2 - 6.4 below.
- 5.3 The TA's narrow focus on the growth in new dwellings within only a small, selected area has served to significantly understate the likely volume of traffic growth that should have been considered in relation to the proposed LS1 development.

6 COMMITTED DEVELOPMENTS

- 6.1 The TA states CBC and HCC asked for only two other committed developments to be taken into account – Welbeck with 85 dwellings and Elm Tree Farm, Pirton with 78 dwellings, yet the consultants have not even complied with that limited requirement. Instead, they have only included the Welbeck development traffic, dismissing the Pirton development as being too remote from the Baratts site – even though the Pirton development would be likely to feed additional traffic onto the A600 between Hitchin and Henlow, so should have been taken into account. In any event, the development at Elm Tree Farm, Pirton is by no means the only other development that should have been taken into account.
- 6.2 In Henlow Camp, Lower Stondon, Pirton and Ickleford alone, many more residential developments, totalling 319 dwellings, have been approved and are due to be implemented, and planning applications for a further 223 dwellings have been submitted, (plus the 185 dwelling Barratts scheme for site LS1) and applications for a further 361 dwellings are understood to be

imminent; quite apart from the further allocations proposed in the Local Plans totalling 519 dwellings, plus the Henlow RAF site major development. The Henlow RAF site is scheduled for re-development in the near future. As stated in the CBC Henlow Site Assessment document (see Appendix E of this report) this could contribute a further 700 dwellings if the mixed-use option in conjunction with a High – Tech Science Park is adopted, or a further 1,800 dwellings, (based on CBC methodology), if the all residential option is adopted.

- 6.3 Adding to this the corresponding development figures for Meppershall and Clifton, a total of 603 dwellings have been approved but are yet to be implemented, applications for a further 351 dwellings have been submitted (plus the 185 dwelling Barratts scheme for site LS1) and applications for a further 531 dwellings are understood to be imminent or are the subject of current appeals against refusal, plus the Henlow RAF site figures as detailed in 6.2 above. (Data on these dwelling figures are shown in Appendix A).
- 6.4 Thus approximately 600 (approved) – 1500 (including submitted, imminent and proposed) additional dwellings are likely to be implemented in this area in the next few years, apart from the 185 dwellings in the Barratts LS1 proposed development. This is also quite apart from the proposed allocations of 199 dwellings in Ickleford within the draft N. Herts Local Plan and the 700 or 1,800 dwellings proposed for the RAF Henlow Camp within the draft CBC Plan.
- 6.5 Even if the absolute minimum of the 603 dwellings approved to date within the local vicinity is considered, not taking into account the Barratts or other submitted, imminent and proposed developments, this will add correspondingly to the already considerable peak period traffic loading on the A507, A600 and A6001 through the area - a potential traffic and congestion time bomb which the developers appear to have no plans to address.
- 6.6 While it would not be reasonable to require the Barratts LS1 site TA to include developments for which applications, though imminent, have not been submitted, and arguably not those which are the subject of current applications, there are clearly a number of significant permitted developments which should be taken into account in assessing cumulative impact, by the highway authorities (Herts CC and Central Beds Council) if not by Barratts.
- 6.7 It is assumed that the the highway authorities should further be considering and modelling the cumulative impact on the road network of all foreseeable forthcoming developments, not just committed ones to ensure proper and responsible management and where appropriate improvement of the network to cater for the foreseeable future demands on it. If necessary they should oppose further developments whose cumulative impact will overload the road network and cause significant congestion at peak periods.

7 FUTURE DESIGN/ ASSESSMENT YEAR

- 7.1 The future year selected for the traffic impact assessment is 2022. It is not explained why this year has been chosen – it may be the assumed year of completion and full occupation of the Barratts development, but normally developers are required to assess for a period of between 5 -10 years after opening, in order to allow for a reasonable period of further background traffic

growth once the development is fully occupied and its traffic impact thereby fully felt.

- 7.2 If however 2022 is meant to represent 5 years after opening, that is clearly incorrect and unreasonable - the development would take at least 2-3 years to construct and be fully occupied, and possibly up to 5 years, even if the current planning permission was approved without appeal.

8 TRIP RATES

- 8.1 The residential trip rates used in the developer's TA have been derived from TRICS data for two existing developments elsewhere – Horsefair, Boroughbridge and Barton Hill, Bury St Edmunds. Neither of these are at all comparable to the proposed LS1 site in respect of its remoteness from the nearest town or the poor range of local facilities.
- 8.2 The Boroughbridge site in particular is in the town of Boroughbridge, which although not large (about twice the population of Stondon Parish) is a reasonably prosperous and busy town with a full range of town centre shops and other facilities very close to the TRICS site and a large Morrison superstore as well as a large garden centre within a reasonable walk (the same distance as the two very small convenience shops at Henlow Camp are from the Barratts LS1 site), and large employment areas also close by. Moreover the Boroughbridge Horsefair development is stated on the TRICS website to have a high proportion of elderly residents, who are less likely to drive or travel far:-

*“This site is located off Horsefair, which heads north and south and is the main throughfare through Boroughbridge. The A1 motorway is located to the west of the site, and heads north and south. The site has 2 vehicle access points, and forms an overall U shape. **Local developments include a church, small shops, and residential streets. The town centre is within a short walking distance. A significant number of people at the site are older people.** The nearest similar site is located 600 metres away.”*

- 8.3 The Bury St Edmunds TRICS site is on the edge of the town, though much closer to the centre than many of the town's suburbs, and is just a few minutes walk from the railway station and a large Tesco superstore, and a reasonable further walk from much of the town centre beyond.
- 8.4 Aerial view screenshots of the Boroughbridge, and Bury St Edmunds areas highlighting the two TRICS sites and their access routes to key facilities, and the comparative screenshot for the Henlow Camp/ Stondon area highlighting the LS1 development site, are reproduced at a common scale at Appendix B of this report.
- 8.5 These two TRICS sites are thus not reasonable comparators for the much less favourably located LS1 site, and the car trip rates derived from them, which have then been used in the developer's TA to estimate the motor traffic the development would generate, are likely to be significant underestimates – residents of the Boroughbridge and Bury St Edmunds developments are far less likely to need or wish to drive for many purposes than residents of the

much more isolated LS1 site development, which is less well served by shops and services.

- 8.6 In this context, it is also relevant to consider the impact of the Welbeck development of 85 dwellings given that the access road would join the A600 on the opposite side of the road a few hundred yards away from the access road for the proposed LS1 development. The Welbeck development consultants based their traffic generation trip rates on a much larger number of TRICS sites. However, those sites were also not reasonable comparators since every single one of those sites (which also include the Horsefair, Boroughbridge one) are in the built-up areas of towns with a much greater and better range of facilities conveniently accessible by non-car means than at the Welbeck west of A600 development site.
- 8.7 The Welbeck traffic consultants have thus significantly underestimated the likely car traffic generation of their approved development, a factor which it appears has unfortunately not been considered at the planning consultation stage. It is important that this issue of the lack of comparable data on traffic generation trip rates is now properly addressed in relation to the proposed Barratts development, particularly given the extent of cumulative development within the area impacting on the local road network, which is already at or near capacity at several key junctions and roundabouts.
- 8.8 It appears from the TAs for other developments that this is a general problem with developments throughout the area – thus there looks to be a general underestimate of motor traffic likely to result from residential development throughout the area, due to the misuse of TRICS data from existing developments in towns with much better non-car access to a much greater range of facilities and travel objectives than any site in this area. Unfortunately, it appears that this lack of comparability may not have been previously identified or considered.

9 DEVELOPMENT TRAFFIC DISTRIBUTION AND ASSIGNMENT TO THE ROAD NETWORK (ie predicting where residents of the development are likely to travel to and from on a daily basis and what routes they will take to get there and back)

- 9.1 While there may be grounds for questioning the validity of some aspects of the methodology used to predict the distribution of the development car traffic (ie where journeys will be made to and from), there is no more reliable method available. Whether the method is any better than informed and considered judgement/ guesswork is debatable.
- 9.2 It is nevertheless highly questionable whether the gravity model used in the TA to predict the distribution of non-work trips, based on the populations of the places within 30 minute drive time, has any real validity as a reliable predictor. There is no evidence of any real correlation between the population of a place and the range, usefulness and attractiveness of the facilities within it, which are far more likely to be the reason for a journey than social visits to residents in those places.
- 9.3 In view of the limitations of the methodology it is advisable to carry out sensitivity tests on junction capacity analysis with different reasonable traffic

distribution/ assignment scenarios. This has not been done for this development, a single derived traffic assignment pattern being presented and used.

- 9.4 It is noted that the development traffic is predicted to split roughly equally north/south along the A600, with 52% to/from the north, which splits roughly 60/40 between the A600 and A569 at the Bird in Hand roundabout with Lower Stondon to the West and Henlow Camp to the East.
- 9.5 The north-south split of development traffic suggested in the TA and used in the assessment is unrealistic because it contrasts sharply with the actual north/south split of traffic on the A600 as shown by the traffic survey data presented in the TA in its table 3.3 (roughly two to one southbound/northbound in the am peak and vice versa in the pm peak). (NB the full automatic traffic count speed and flow data is stated to be contained in Appendix A of the TA but is not there, only peak hours traffic movement data at the assessment junctions being presented).
- 9.6 In addition, this over-simplified North/South split of development traffic at this roundabout, as suggested in the developer's TA, is misleading because it takes no account of existing or future East/West traffic flows. There is in reality a considerable volume of traffic generated from existing developments at Lower Stondon to the west and Henlow Camp to the east, which is likely to increase further given the extent of development in the area. (as detailed in Appendix A).

10 ASSESSMENT NETWORK AND JUNCTIONS CAPACITY/ IMPACT ANALYSIS

- 10.1 The assessment network in the Barratts development TA consists of the A600 between the A507/ Chapel Road roundabout north of Henlow and the Fishponds Road mini roundabout in north Hitchin.
- 10.2 The assessment in the developer's TA indicates that:
- The Station Road/ Hitchin Road ('The Bird in Hand') roundabout in the middle of Henlow Camp currently operates well within capacity and will continue to do so in 2022 with the development traffic. **This however conflicts with the assessment in the Welbeck site development TA which indicates that by 2021 with just the Welbeck development traffic the junction will already be close to capacity on the southbound and westbound approaches in the AM peak and on the northbound approach in the PM peak.**
 - The A507/ Chapel Road ('The Airman') roundabout currently operates comfortably within capacity but in 2022 with the development traffic the A507 and A600 approaches will have slightly less than the desirable 15% spare capacity at peak times. **This however conflicts with the assessment in the Welbeck site development TA which indicates that by 2021 with just the Welbeck development traffic the junction will already be at or over capacity on three of the four main road approaches the AM peak and on two main road approaches in the PM peak.**

- The Turnpike Lane mini roundabout on the A600 in Ickleford currently operates just within acceptable spare capacity, but in 2022 with the development will be at virtually full capacity in the peak direction on the A600 (ie southbound in the AM peak and northbound in the PM peak) and on the Turnpike Lane approach in the AM peak:-
 - Bearton Road/ Redhill Road double mini roundabouts will be over capacity in 2022 with or without this development.
- 10.3 The TA seeks to dismiss the ‘with development’ capacity problems as not primarily attributable to the LS1 development.
- 10.4 The glaring disparities between the Welbeck and Barratts capacity assessments of the ‘Bird in Hand’ and Airman roundabouts are of serious concern and bring into question the reliability of either assessment. Even if the Welbeck assessment may err on the pessimistic side (and we are not saying it does) it is highly likely that the Barratts assessment on the other hand errs significantly on the optimistic side and seriously understates the true situation on the basis of ‘without’ as well as ‘with’ the LS1 development traffic.
- 10.4 All this is anyway without taking into account the substantial additional traffic which will be generated by the many approved developments yet to be implemented, let alone further developments likely to be approved in the near future, as detailed in paragraphs 6.2 – 6.4 of this report. There are particular areas which give rise to concern within the local road network.
- 10.5 The LS1 developer’s own TA concedes that the Turnpike Lane Mini roundabout will be operating at virtually full capacity by 2022. This key concern is also highlighted in the response dated 10th October by HCC. In relation to the addition of the LS1 development traffic alone, The HCC report quotes from the developer’s TA in Table 6.8 and Table 6.9:-

“The RFC (Ratio of flow to capacity) for the A600 during the AM and PM travelling peak period is currently operating above the design capacity of 0.85. The ARCADY Model predicts the RFC for the A600 will increase from 0.85 TO 0.99 during the AM Peak and Turnpike Lane from 0.79 to 0.97 during the PM Peak with the addition of vehicle trips generated by the development. The impact of the development results in an additional 19 vehicles queued during the AM Peak on the southbound A600”.

The HCC report states categorically that:-

“The junction modelling contained in the TA indicates that the proposed development will have an impact on the above junction. The applicant will need to provide further justification that the impact of the additional vehicles generated by the proposed development on this particular junction can be considered acceptable.” (Appendix C)

This stipulation is based on the impact of the 185 dwelling LS1 development alone, without taking into account the 603 new dwellings in other permitted developments in the area to date, quite apart from those applications which

have been submitted awaiting decision, those which are imminent and those which have been proposed in the CBC and N Herts local plans, let alone the impact of dwellings from the re-development of the RAF Henlow Camp site, scheduled to close in 2020.

The HCC report further states:-

“The analysis in the TA indicates that the additional vehicle trips generated by the proposed development will have a significant impact on the min-roundabout at Ickleford.”

- 10.6 In addition, the developers have not considered the impact of the approved/submitted developments, or the 199 proposed dwellings in the North Hertfordshire Local Plan. The IC3 site development of 150 dwellings at Ickleford abuts and would require a new access on the A600, which would generate additional traffic on the A600 resulting in further congestion. The impact of this potential new access road near the Turnpike Lane mini-roundabout has not been mentioned, or addressed, in the LS1 developer's TA.
- 10.7 It is quite clear that the Turnpike lane mini roundabout would not cope with the additional traffic loading which would result from any, let alone all these developments and that serious traffic congestion would result.
- 10.8 In relation to potential measures to mitigate the overcapacity problem at this Turnpike Lane roundabout it is difficult to envisage which practical measures could be employed to alleviate the congestion. Given the nature of the location and in particular the proximity of adjacent housing, the A600/ Turnpike Lane junction does not lend itself to significant capacity enhancements, without unacceptable detriment to the local environment and street scene and to pedestrian and cyclist amenity and safety. The current mini roundabout layout is pedestrian and cyclist-unfriendly as it is, and any likely enlargement, even if that were feasible, would make it even more so.
- 10.9 The A6001/ A507 roundabout (near The Crown, Henlow village) is another point of concern yet it is not included in the Barratts TA despite the significant proportion of development traffic routed through it via Hitchin Road. The Welbeck site TA also originally excluded this roundabout but has subsequently been extended to include it at the request of Stondon Parish Council (Technical Note 13th April 2017 at Appendix C of this report).
- 10.10 The Welbeck consultants' assessment of the A6001/ A507 roundabout near the Crown Pub shows that the roundabout is already operating at or near capacity in the peak hours. However, the scope of the assessment is restricted because it considers only the existing situation and 'existing plus Welbeck traffic' ie not future year of opening of the Welbeck development nor any year beyond that. On this unsatisfactory basis the Welbeck TN concludes that as on theoretical analysis the development traffic would only worsen conditions at the roundabout by a small degree the development impact would be acceptable.
- 10.12 Quite apart from this deficiency in failing to include background traffic growth after the completion of the Welbeck development, the assessment fails to address the fact that traffic conditions at such junctions which are already operating at or near capacity are subject to instability. This is likely to result in

a situation whereby any increase in traffic demand, such as from this proposed Barratts development of 185 dwellings, has a disproportionate impact. The ARCADY roundabout analysis program, based on mathematical equations rather than simulation of vehicle movements, cannot represent or predict such instability.

- 10.13 The fact that an assessment of this key A6001/A507 Crown roundabout is excluded from the Barratts TA is a fundamental omission. Had a full assessment been carried out with appropriate parameters set, that included an evaluation of future traffic growth, not just for the Welbeck and Barratts developments, but also for the other committed developments impacting on this roundabout, the results would have provided a worthwhile set of data, upon which an informed assessment of the LS1 development could be made. As it stands, any decision would currently have to be made on the basis of incomplete data.

11 ACCESS LOCATION AND DESIGN

- 11.1 The proposed development road access may prove to be potentially satisfactory in location and design. However, the apparent absence of an independent Stage 1 Highway Safety Audit and Designer's Response is not acceptable – those should have been included in the TA or as a separate submission in support of the planning application, taking account also of the nearby approved (subject to S106 agreements), but yet to be implemented, access road and junction opposite for the Welbeck site development. In addition, these should have taken account of the nearby Holwellbury concealed junction to the South, as well as the nearby Cherry Trees roundabout to the North along the A600.
- 11.2 The current measured excessive speeds indicate that 15% of vehicles are travelling at 15 mph or more above the speed limit, hence there is evident widespread disregard of the relatively recently introduced 40 mph speed limit, which is of serious concern. The traffic calming measures proposed in conjunction with the Barratts and Welbeck developments may in theory help to combat this to some extent, but are unlikely to achieve anywhere near full compliance with the existing 40 mph limit, let alone the lower proposed limit of 30 mph.
- 11.3 The further speed limit reduction to 30 mph suggested in conjunction with the Barratts development is unlikely to be a realistic proposition or an acceptable one to the highway authority (let alone the police) unless and until traffic calming and/or enforcement measures succeed in producing reasonable compliance with the existing 40 mph limit.
- 11.4 The A600 is designated as a main distributor road and as such is currently subject to the national speed limit for the majority of its length. The national speed limit applies to the section in the South extending to the Holwellbury concealed junction a few hundred yards away, where it then changes to 40mph for the stretch where the proposed junction to the LS1 development would be located, together with the access opposite to the Welbeck development. Many drivers do not currently slow down to 40mph along this stretch of the A600, particularly as there are no speed cameras or other enforcement measures to encourage them to slow down along this section.

Given the current lack of adherence to the newly introduced 40 mph speed limit, there is even less likelihood that drivers would slow down to the 30 mph speed limit assumed in the developer's TA.

11.5 In their Consultee Report dated 10th October 2017 HCC state:-

“The viability of the proposed site access is dependent on the speed limit being lowered to 30mph. However, the applicant has not provided adequate justification that lowering the speed limit would be consistent with the HCC Speed Management Strategy.... the applicant has not demonstrated that safe vehicle access to the site from Bedford Road is achievable. The applicant will need to provide the following information and demonstrate that the speed limit is feasible and meets the Key Criteria contained in the Speed Management Strategy: A Road Safety Audit demonstrating that the proposed junction is a safe solution.” (Appendix C of this report).

11.6 The HCC report further states:-

“However, the decision to lower the speed limit is determined through providing adequate information and consultation with relevant stakeholders (such as the Hertfordshire Constabulary). The setting of speed limits in Hertfordshire is determined by the HCC Speed Management Strategy (March 2014). The lowering of speed limits will only be considered where it can be demonstrated they meet and contribute to the: Speed Management Strategy (including the Key Criteria) and Local Transport Plan Goals.” (Appendix C of this report).

12 PROPOSED BUS STOPS

12.1 The proposed additional bus stops on the A600 adjacent to the Barratts development would be highly desirable if not essential. The proposal to site both bus stop cage areas directly opposite each other rather than staggered is not however satisfactory - while the current limited service frequency may make the incidence of buses in both directions stopping simultaneously, thereby completely blocking the road, a relatively infrequent occurrence, it should be avoided by relocating the southbound stop southwards (rather than the northbound stop northwards which would bring it too close to the Holwellbury/ forthcoming Welbeck development access).

13 OTHER LIMITATIONS ON TRAFFIC

13.1 It is understood that Central Bedfordshire Council requires that new development will not result in daily (24 hour) total 2-way traffic flow on the Bedford Road exceeding 10,000 vehicles, in order not to impair the ability of the MBDA hazardous substances and weapons production site off the A600 north of Henlow Camp, to continue to function (as detailed in pages 116 – 127, and particularly page 120 (Physical Constraints') and 126-127

(‘Assessment Conclusion’) of CBC Site Assessment Forms Henlow, reproduced at Appendix D of this report).

- 13.2 Although the CBC Site Assessment is of the RAF Henlow development site, its comments and conclusions in regard to the traffic volume limitation on Bedford Road are clearly applicable to ALL new development whose individual or cumulative traffic would result in the total traffic volume on Bedford Road exceeding 10,000 vehicles per day:-

“.....development would be required to ensure that it would not result in the total number of vehicular movements upon Bedford Road to equal or exceed 10,000 movements in 24 hours, to ensure development would not negatively affect the ability of the MBDA to continue activities.” (Appendix E of this report).

“.....the scale of development will need to be carefully considered to ensure that the total movements on Bedford Road would not exceed 10,000 movements per 24 hours. If movements would exceed 10,000 per 24 hours then this would affect the activities of an existing business use, contrary to the NPPF. Traffic movements from residential development cannot be controlled by Planning Conditions unlike commercial deliveries and vehicular movements associated with commercial uses.....” (Appendix E of this report).

- 13.3 It is not clear from the TS that this proposed LS1 site development of 185 dwellings will avoid infringing this requirement, particularly when considered in conjunction with the 600 dwellings approved to date, as well as the significant imminent and proposed growth in the area. This is apart from the major re-development at RAF Henlow in the near future, scheduled to close in 2020, thus falling within the assessment period stated in the LS1 site developer's TA.

14 CONCLUSIONS

- 14.1 Even taken in isolation from consideration of the traffic impact of the many other committed and anticipated other housing developments in the area, the transport assessment prepared and submitted in support of this development has a number of obvious defects, including:-

- Exaggerating the usefulness and attraction of the local shopping and other facilities at the Bird in Hand roundabout, and the attractiveness of non-car travel to those facilities; thereby understating the likely propensity of residents of this development to drive.
- Failure to explicitly acknowledge the current complete lack of any cycle facilities in the area, and failure to propose any measures to rectify that serious deficiency in provision for sustainable travel.
- Failure to assess for an adequate number of years following likely year of completion and full occupation of the development.

- Narrow focus, when considering background traffic growth, on a small, selected portion of the area, mainly in the north around the villages of Meppershall and Clifton, rather than the entire study area. The exclusion of several other villages in the local area has resulted in a significant under-statement of likely traffic growth figures.
 - Failure to undertake a full analysis of all the committed developments, ((nor any recognition of other submitted, imminent or proposed developments in the area) thus omitting to evaluate the cumulative impact on transport infrastructure of all cross-border developments considered in conjunction with the LS1 development of 185 dwellings.
 - Underestimation of the likely car trip rates per dwelling through use of inappropriate TRICS comparator data from urban residential developments rather than comparable edge-of-village or out-of-village developments.
 - Dubious development traffic distribution and assignment basis, which conflicts with the actual existing pattern of traffic movement in the area, compounded by the failure to carry out sensitivity tests on the capacity impact on assessed road junctions with alternative traffic assignment scenarios.
 - Failure to assess the future traffic growth at the key Turnpike Lane, Ickleford roundabout, which is already operating at or near full capacity, In particular, the failure to assess the impact of the new access road onto the A600 to be created for the proposed IC3 site of 150 dwellings
 - Failure to include the A507/A6001 roundabout junction near The Crown in the assessment despite a significant proportion of the development traffic having been routed via the A6001 and hence through that junction.
 - Failure to consider the cumulative impact of traffic on the A600 to avoid infringing the 10,000 vehicle per day limit set by CBC in relation to the operation of the MBDA Defence site which handles hazardous materials.
- 14.2 There are a number of inaccuracies and omissions contained within the developer's TA. Had a full assessment been carried out, with appropriate parameters set, that included future traffic growth for all the other committed developments impacting on this road network, the results would have provided a worthwhile set of data, upon which an informed evaluation of the LS1 development could be made. As it stands, any decision would currently have to be made on the basis of incomplete and in some cases inaccurate data.
- 14.3 It is of further serious concern that there appears to be:-
- A piecemeal consideration of each proposed development in the area with no serious recognition of the considerable cumulative impact on the road network of the significant number of committed developments within the vicinity.
 - Neither modelling of the cumulative impact nor consideration in any serious way of the substantial enhancements to the road network which

would be necessary to accommodate the resultant additional traffic loading and/or the even more substantial measures which would be needed to enhance (or introduce) adequate provision for sustainable non-car travel to eliminate or reduce the need for such highway works.

- A lack of awareness that developers may be underestimating the volume of traffic their developments are likely to generate. It is important that proposed developments are not considered to be acceptable on the basis of under-estimated traffic volume because likely trip rates have been extrapolated from non-comparable TRICS sites. A more thorough examination of their Transport Assessments in respect of such matters as the appropriateness and applicability of the TRICS sites chosen to predict development trip rates is essential. This would help to prevent a situation whereby inappropriate data may be utilised to lend support for an unviable and unsustainable development.
- No consideration of the cumulative impact of the very significant numbers of developments in the local area and of the cross-border implications on transport infrastructure.

14.4 The result, if this and other developments are allowed to go ahead without proper attention to such matters, will be a traffic congestion time bomb which will have very serious consequences for the whole area.

LIST OF APPENDICES:

- A. DATA REPRESENTING NEW DWELLINGS APPROVED, SUBMITTED, IMMINENT AND PROPOSED (Clifton, Meppershall, Lower Stondon, Henlow, Ickleford, Pirton)

- B. SCREENSHOTS OF TWO TRICS DATA AREAS USED AND LS1 AREA

- C. RESPONSE BY HERTFORDSHIRE COUNTY COUNCIL DATED 10TH OCTOBER 2017

- D. REPORT ON "AIRMAN" ROUNDABOUT BY STUART MICHAEL ASSOCIATES (Commissioned by Stondon Parish Council re Welbeck development)

- E. CENTRAL BEDFORDSHIRE COUNCIL SITE ASSESSMENT FORMS HENLOW

.

APPENDIX A

Data Representing New Dwellings

Approved, Submitted, Imminent and Proposed

Total new dwellings in developments approved, submitted, imminent and proposed within a 3 mile radius of LS1 are **2,888** based on mixed use at RAF Henlow (hi tech science park & residential option) and **3,989** if the 'all residential' option is adopted at RAF Henlow. These totals are broken down as follows:-

1. **Total Applications Approved: 603 Dwellings**
2. **Total Applications Submitted: 536 Dwellings**
3. **Total Applications Imminent: 531 Dwellings**
4. **Total Sites Proposed in Local Plans: 519 Dwellings**
5. **Plus RAF Henlow (700 Dwellings if mixed use/or 1,800 Dwellings if all residential)**
6. **Total Applications Approved & Recently Constructed: 183**

LOWER STONDON:

1. Land West of Bedford Rd , Lower Stondon (**WELBECK Development) 85 Dwellings Approved 2017** With access road on the West side of the Bedford Rd
2. Land to rear of 104 to 168 Station Rd, Lower Stondon (**BOVIS Development - Stondon Park Phase 2) 80 Dwellings Approved 2016**
3. Stondon Transport Museum, Lower Stondon **25 Dwellings Approved 2016**
4. Land East of Bedford Rd, Lower Stondon (**BARRATS Development LS1) 185 Dwellings Application submitted Aug 2017** N Herts but extension to Lower Stondon
5. Rear Station Road behind Doctors surgery towards stadium 15.5 acres (**BLOOR Development - Phase 1) 145 Dwellings Application imminent Oct/Nov 2017**
6. Hillside Rd, Lower Stondon **35 Dwellings Application imminent Nov/Dec 2017**
7. 186,188 and land to the Rear of Station Road Lower Stondon (**BOVIS - Stondon Park Phase 1) 98 Dwellings Approved & Recently Constructed**

ICKLEFORD:

1. Ickleford Manor, Turnpike Lane, Ickleford **19 Dwellings Approved**
2. Bowmans Mill **71 Dwellings Application submitted and very likely to be approved as brownfield site**
3. IC 1 Land at Duncoats Close **9 Dwellings Proposed in Herts Local Plan**
4. IC 2 Land at Burford Grange, Bedford Rd **40 Dwellings Proposed in Herts Local Plan**
5. IC 3 Land at Bedford Rd, Ickleford **150 Dwellings Proposed in Herts Local Plan, (pages 169 - 171)** with the creation of a new access road onto the A600, the impact of which has also not been considered by Barratts. In terms of distance to local services for LS1 it is important to note in Point 13.160 of the Herts Local Plan that *"Ickleford Primary is a 1FE (One form Entry) school and regularly fills most of its available places from the local area..."* Point 13.161 further states *" The estimated number of homes on site 1C3 makes allowance for the provision of a new primary school of up to 2FE on this site."* However, the larger LS1 development of 185 dwellings makes no such allowance for any new primary school provision on that site. Instead, the developers Transport Assessment merely quotes walking distances to the Ickleford Primary School, which is already full according to the above statements from the Herts Local Plan.
6. Former site of Green Man Public House, Turnpike Lane, Ickleford **8 Dwellings Approved and Recently Constructed**

HENLOW:

1. Clifton Rd, Henlow **9 Dwellings Approved**
2. Hitchin Rd Henlow **12 Dwellings Approved**
3. High Street, Henlow (Old Parachute pub) **11 Dwellings Approved**
4. Millenium Meadow **59 Dwellings Application submitted**
5. Middlefield Lane **8 Dwellings** Application submitted
6. Stockbridge Road, Henlow **46 Dwellings** Application imminent
7. Land off Langford Rd, Henlow (CB /16/ 02721/OUT application) **(GLADMAN Development) 135 Dwellings Refused but Appeal in December**
8. The Dairy, Henlow (CREST NICHOLSON Development) **175 Dwellings** Refused - no appeal date as yet
9. Clifton Rd, Henlow **37 Dwellings** Refused - no appeal date as yet
10. 6 sites passed through to next stage in the CBC Draft Local Plan with **Proposed 320 Dwellings**
11. RAF Henlow is earmarked to close in 2020. Two options exist in draft CBC Local Plan; **Option 1 - Hi Tech Science Park with Proposed additional 700 dwellings. Option 2 - If site not partly used as science park , Proposed 1,800 Dwellings (based on CBC methodology). The MOD would like 5,000 - 6,000 Dwellings here!**

PIRTON:

1. South side of Holwell Rd (**CALA HOMES Phase 1 GLADMAN Development**) **78 Dwellings Approved May 2017**
2. South Side of Holwell Rd (**Phase 2 GLADMAN Development**) **85 Dwellings submitted (Reduced from original 99 Submitted)**

CLIFTON:

1. South Paddock, High St, Clifton (CB/16/04919/OUT) **22 Dwellings Approved**
2. SWCC, Shefford Road, Clifton (CB/15/01657/OUT) **64 Dwellings Approved Oct 2017**
3. New Road, Clifton (GLADMAN) (CB 15/02733/OUT) **97 Dwellings Approved (On Appeal) 2017**
4. Hitchin Rd, Clifton (HALES) (CB/17/03538/OUT) **80 Dwellings Application Submitted**
5. Stockbridge Road North, Clifton (WHEATLEY HOMES) **20 Dwellings Application Imminent**
6. The Paddocks, New Road, Clifton (TAYLOR WIMPEY) (CB/13/01308/FULL) **70 Dwellings Approved recently and Under Construction**

MEPPERSHALL:

1. Land behind Old Village Hall, Meppershall (**CROUDACE**) **86 Dwellings Approved Feb 2017**
2. Land adjacent 23 Shefford Rd, Meppershall **6 Dwellings Approved**
3. New Close Nurseries, Fildyke Rd, Meppershall **9 Dwellings Approved**
4. New Close Nurseries, Fildyke Rd, Meppershall **10 Dwellings Application Submitted**
5. 100 High St, Meppershall **38 Dwellings Application Submitted**
6. Stocken House, 59 Shefford Rd, Meppershall (**GLADMAN**) **150 Dwellings Refused May 2017 but Appeal in Jan 2018**
7. (Also Second Alternative Application submitted August 2017 for 145 Dwellings on same site)
8. Old Methodist Church, High Street, Meppershall **7 Dwellings Approved Dec 2016 and Under Construction**

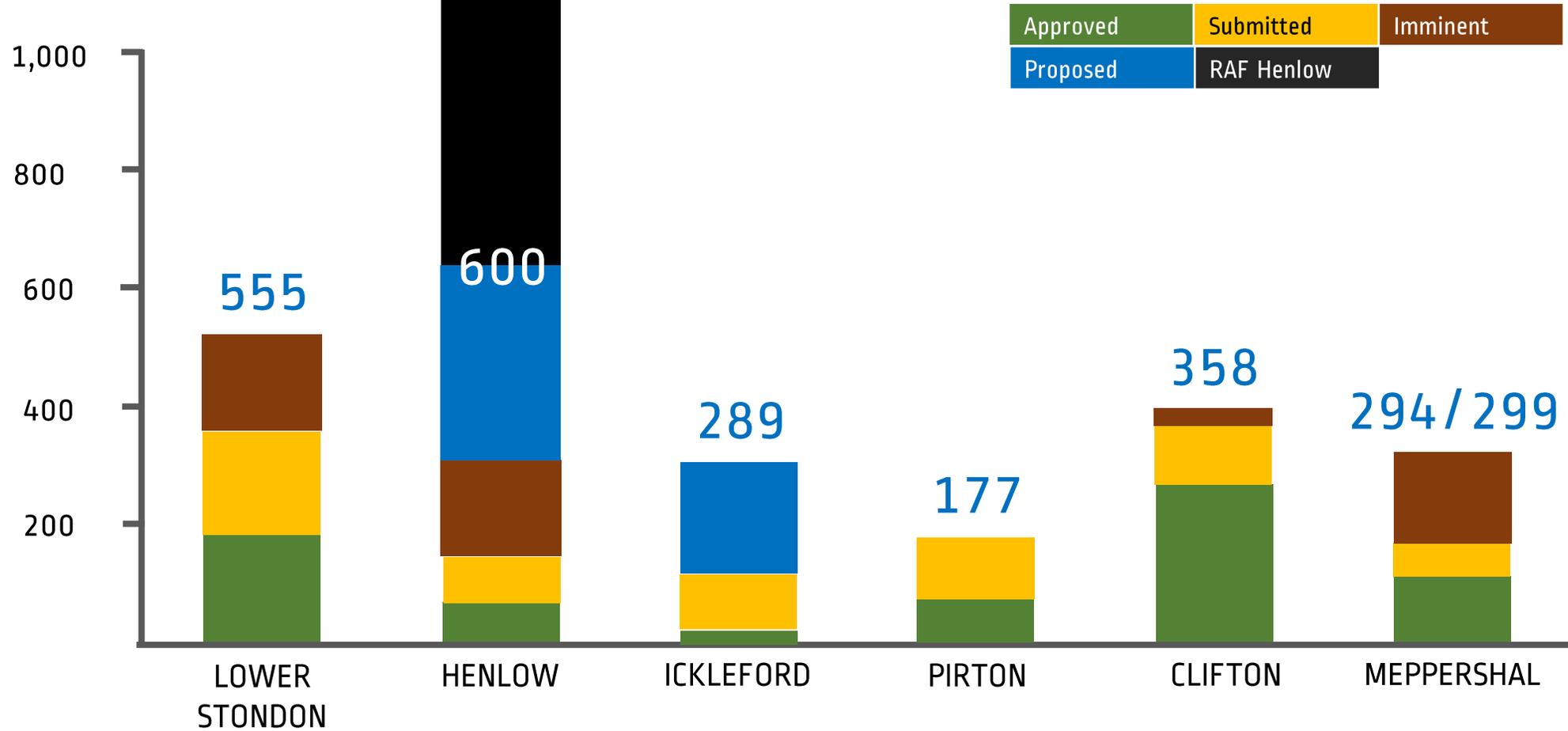
DEVELOPMENTS WITHIN 3 MILE RADIUS OF LS1 | DWELLING TOTALS



Figures as of November 2017

1,300/2,400

DEVELOPMENTS WITHIN 3 MILE RADIUS OF LS1 | DWELLING TOTALS



Figures as of November 2017

LOWER STONDON

	LOWER STONDON	Dwellings	Total per category
1	Land West of Bedford Rd , Lower Stondon, with access road on the west side of the Bedford Rd.	85 [WELBECK]	190
2	Land to rear of 104 to 168 Station Rd, Lower Stondon. Stondon Park Phase 2].	80 [BOVIS]	
3	Stondon Transport Museum, Lower Stondon.	25	
	Land East of Bedford Rd, Lower Stondon. In North Herts, but 'extension' to Lower Stondon	185 [BARRATTS]	185
5	Rear Station Road behind Doctors surgery towards stadium 15.5 acres [Phase 1].	145 [BLOOR]	180
6	Hillside Rd, Lower Stondon.	35	
			Total: 555

Approved Submitted Imminent Proposed

Figures as of November 2017

HENLOW

HENLOW		Dwellings	Total per category
1	Clifton Road, Henlow.	9	32
2	Hitchin Road, Henlow.	12	
3	Old Parachute Pub, High Street, Henlow.	11	
4	Millennium Meadow, Henlow.	59	67
5	Middlefield Lane, Henlow.	8	
6	Stockbridge Road, Henlow.	46	181
7	Langford Road, Henlow. Refused, but on appeal.	135 [GLADMAN]	
10	X6 sites passed through to next stage in draft Central Beds Local Plan.	320	320
			Sub: 600
11	Plus RAF Henlow (700 Dwellings if mixed use/or 1,800 Dwellings if all residential)	700 / 1,800	700 / 1,800
			1300 / 2400

Approved
Submitted
Imminent
Proposed
RAF Henlow

Figures as of November 2017

ICKLEFORD

ICKLEFORD		Dwellings	Total per category
1	Ickleford Manor, Turnpike Lane, Ickleford.	19	19
2	Bowmans Mill, Ickleford. Application submitted and likely to proceed	71	71
3	IC1 Duncots Close, Ickleford	9	199
4	IC2 Burford Grange, Bedford Road, Ickleford	40	
5	IC3 Bedford Road, Ickleford*	150	
			Total: 289

Approved	Submitted	Imminent	Proposed
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Figures as of November 2017

PIRTON

PIRTON		Dwellings	Total per category
1	Holwell Road, Pirton. [Phase 1]	78 [GLADMAN [CALA]]	78
2	Holwell Road, Pirton.	99 [GLADMAN]	99
			Total: 177

Approved Submitted Imminent Proposed

CLIFTON

CLIFTON		Dwellings	Total per category
1	South Paddock, High Street, Clifton.	22	258
2	SWCC, Shefford Road, Clifton.	64	
3	New Road, Clifton.	97	
4	Hitchin Road, Clifton.	80	80
5	Stockbridge Road North, Clifton.	20	20
			Total: 358



Figures as of November 2017

MEPPERSHALL

MEPPERSHALL		Dwellings	Total per category
1	Old Village Hall, Meppershall.	86	101
2	23 Shefford Road, Meppershall.	6	
3	New Close Nurseries, Fildyke Road, Meppershall	9	
4	New Close Nurseries, Fildyke Road, Meppershall	10	48
5	100 High Street, Meppershall	38	
6	Stockdon House, 59 Shefford Road, Meppershall. 150 refused May 2017 [Appeal 1/2018]. Alternative 145 dwellings on same site	145 or 150*	145 or 150
			Total: 294 / 299



Figures as of November 2017

HENLOW

TOTAL: 600

MEPPERSHALL

TOTAL: 294/299

LOWER STONDON

TOTAL: 555

PIRTON

TOTAL: 177

CLIFTON

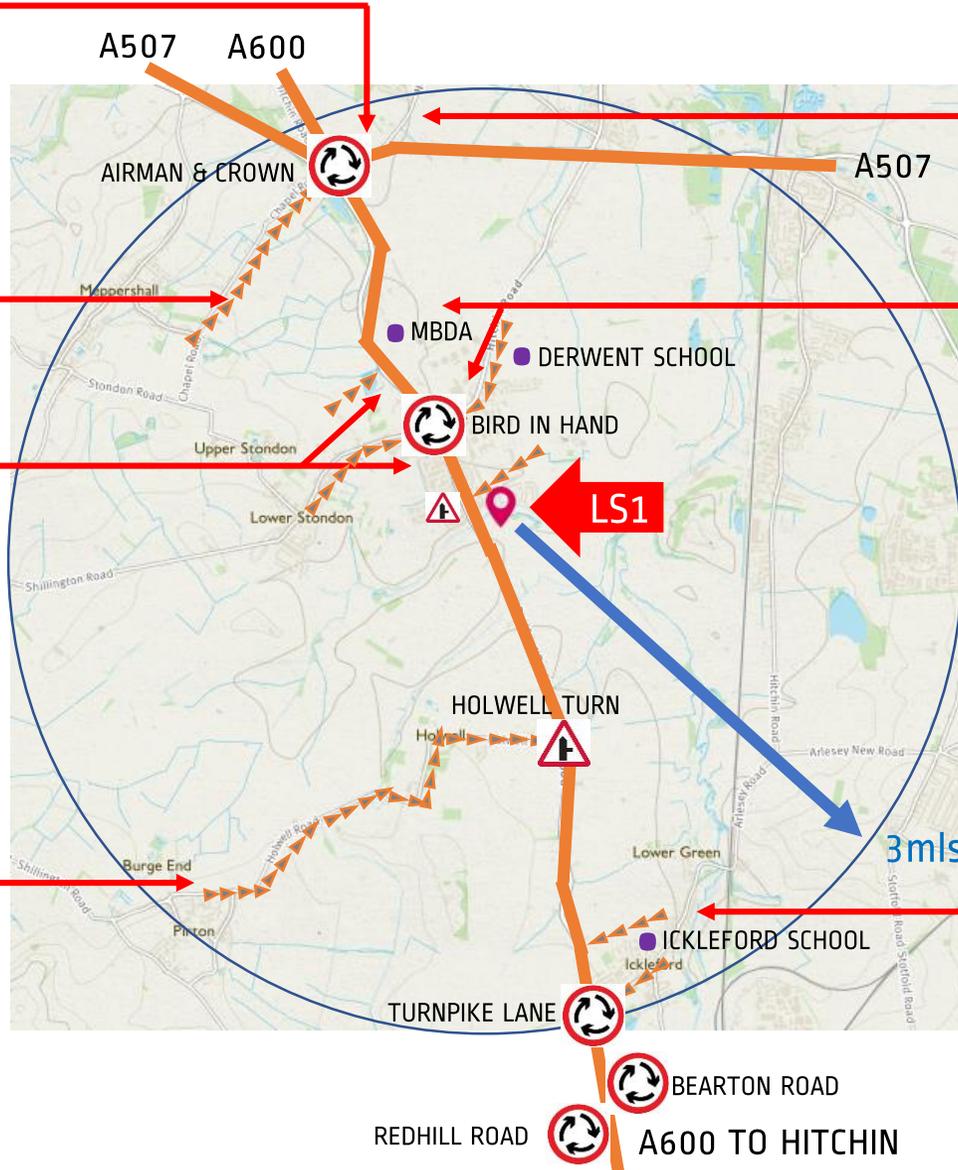
TOTAL: 358

RAF HENLOW

TOTAL: 700/1800

ICKLEFORD

TOTAL: 289



EXPANDED VIEW

A600 TO A507



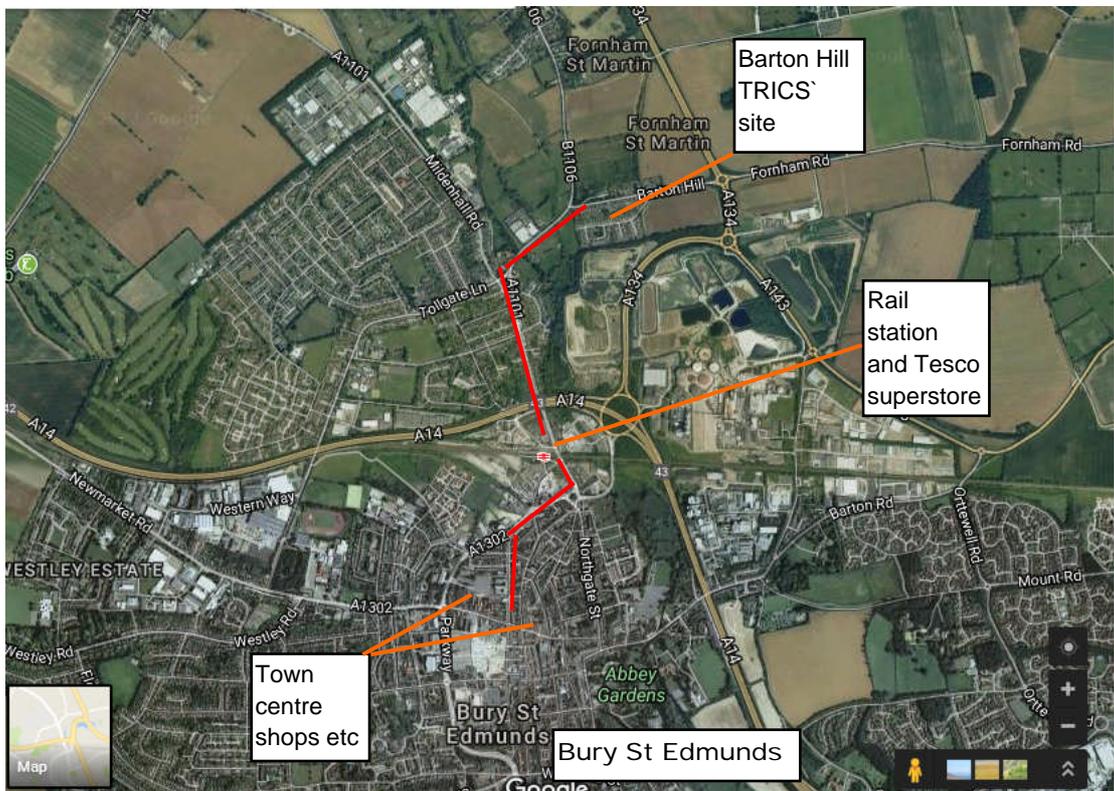
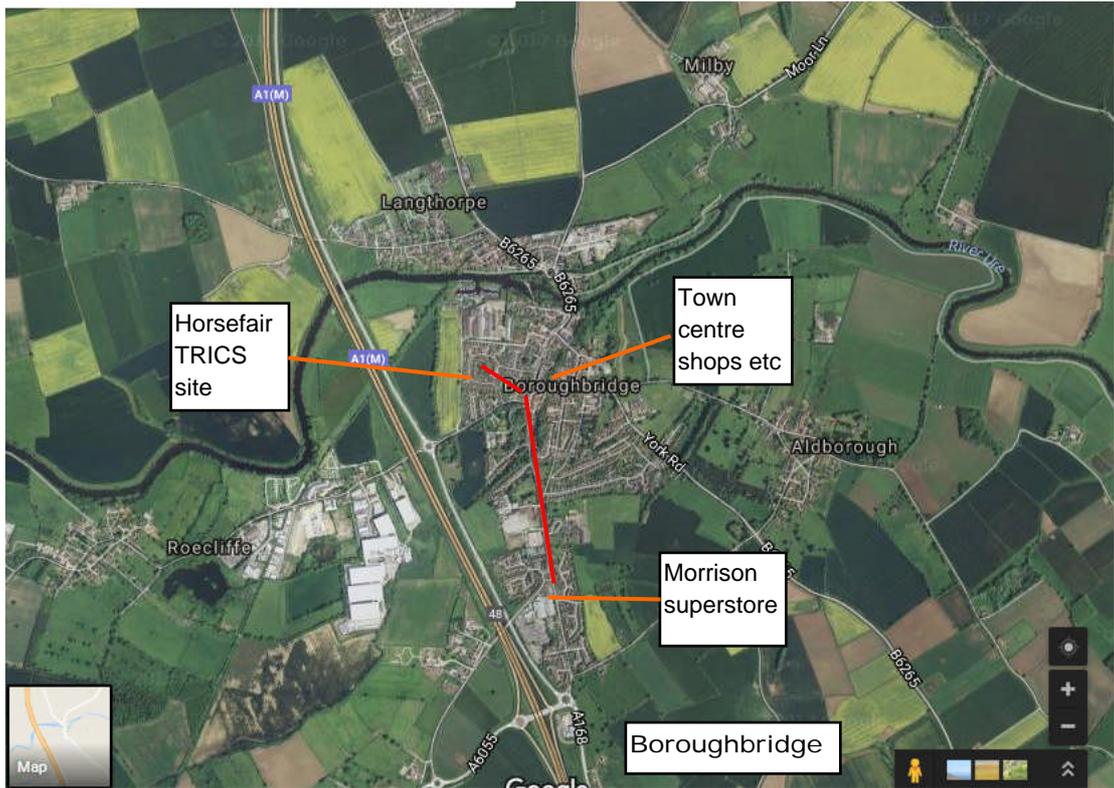
A600 TO HITCHIN

APPENDIX B

Screenshots of Two TRICS Data Areas Used and LS1 Area

The following aerial screenshots, all on the same scale show residential developments with the most direct access routes to key local facilities marked in red line in (1) Stondon/ Henlow, (2) Boroughbridge and (3) Bury St Edmunds (proposed developments in the case of Stondon/ Henlow; existing developments included in the TRICS traffic generation database in the cases of Boroughbridge and Bury St Edmunds).





APPENDIX C

Consultation Response by Hertfordshire County Council

Dated 10th October 2017

COMMENTS : The application comprises of the residential development of 185 dwellings comprising 27 x 1 bedroom apartments; 19 x 2 bedroom apartments; 18 x 2 bedroom houses; 56 x 3 bedroom houses; 61 x 4 bedroom houses; and 4 x 5 bedroom houses; new vehicular access onto Bedford Road, associated garages and car parking space, public open space, landscaping and ancillary works.

The Hertfordshire County Council considers additional information is required for the proposed development for the following;

The viability of the proposed site access is dependent on the speed limit on Bedford Road being lowered to 30mph. However the applicant has not provided adequate justification that lowering the speed limit would be consistent with the HCC Speed Management Strategy. If the speed limit on Bedford Road was to remain 60mph, then it is unlikely that the required visibility splays could be provided. Therefore the proposed vehicle access to the site is not considered to be acceptable.

Further issues are contained in the sections within this response and are summarised below:

The analysis in the TA indicates that the additional vehicle trips generated by the proposed development will have an impact on the Turnpike Lane Bedford Road. Further justification is required to demonstrate that this impact would be acceptable. Financial contributions towards local sustainable transport initiatives may be required to mitigate this impact.

SITE DESCRIPTION

The site is located along the Bedford Road that is designated as a main distributor road and is currently subject to the national speed limit. At the northern edge of the site, the speed limit is reduced 30mph.

ANALYSIS

TRIP GENERATION AND DISTRIBUTION

EXISTING TRIP GENERATION

The site is currently greenfield and does not generate any vehicle trips.

PROPOSED TRIP GENERATION

The proposed trip generation rates are based on the TRICS database resulting 'worst-case scenario' in terms of the number of trips generated.

Overall, this approach to estimate the number of trips generated is considered to be robust.

IMPACT ON HIGHWAY NETWORK

The capacity of the Bedford Road/ Turnpike Lane/Westmill Lane mini-roundabout was assessed within the TA:

The tables contained Table 6.8: Operational Assessment for Bedford Road/ Turnpike Lane/ Westmill Lane and Table 6.9: Operational Assessment for Bedford Road/ Turnpike Lane/ Westmill Lane indicate that there will be a slight deterioration in performance at the roundabout with the addition of the development traffic. The RFC for the A600 during the AM and PM travelling peak period is currently operating above the design capacity of 0.85. The ARCADY model predicts the RFC for the A600 will increase from 0.85 to 0.99 during the AM Peak, and Turnpike Lane from 0.79 to 0.97 during the PM Peak with the addition of vehicle trips generated by the development. The impact of the

development results in an additional 19 vehicles queued during the AM Peak on the south bound A600.

The junction modelling contained in the TA indicates that the proposed development will have an impact on the above junction.

The applicant will need to provide further justification that the impact of the additional vehicles generated by the proposed development on this particular junction can be considered acceptable. The current level of impact would justify financial contributions towards improvements to the junction or for sustainable transport modes in order to reduce the number of vehicle trips generated by the development and thereby reduce the impact on the surrounding junction.

ROAD SAFETY

VEHICLE ACCESS

The site will be accessed from the Bedford Road via a proposed priority junction. Roads in Herts states that guidance on junction type can be obtained from TD42/95 and MfS. To align other access along the A600 the proposed access should be considered to be constructed as ghost island priority junction. This would be considered appropriate based on the current and proposed function of Bedford Road.

VEHICLE TO VEHICLE INTER-VISIBILITY

The proposed access arrangement has been designed with a visibility splay to the northern direction of 2.4 metres x 167 metres. This visibility splay is based on a vehicle travelling at 53.5mph. However this section of Bedford Road is subject to a National Speed Limit of 60mph. As a result, the feasibility should be considered on how to deliver the reduction of the proposed speed limit as shown on drawing ITB12014-GA-002 in order for the proposed visibility splays to be considered safe.

However, the decision to lower the speed limit is determined through providing adequate information and consultation with relevant stakeholders (such as the Hertfordshire Constabulary).

The setting of speed limits in Hertfordshire is determined by the HCC Speed Management Strategy (March 2014). The lowering of speed limits will only be considered where it can be demonstrated they meet and contribute to the:

¿ Speed Management Strategy (including the key criteria); and ¿ Local Transport Plan Goals.

One of the goals of the Speed Management Strategy is to support economic development and planned dwelling growth. The HCC recognises that some form of development has been planned for at this location. However, the applicant has not demonstrated that safe vehicle access to the site from Bedford Road is achievable.

The applicant will need to provide the following information and demonstrate that the speed limit is feasible and meets the Key Criteria contained in the Speed Management Strategy:

¿ A Road Safety Audit demonstrating that the proposed junction design is a safe solution.

Roads in Herts states that footways on roads with a speed limit of 40mph or more should ideally be separated from the carriageway by a 1.5m verge strip and have an absolute minimum width of 2m and a minimum effective width 1.5m. A 2.0 metre wide footway would need to be provided on the northern side of the development toward the adjacent site that links to the proposed internal path network within the site.

Overall, the draft TP is considered to be adequate for the proposed development, and a Full TP should be secured via a s106 Agreement.

Planning Obligations / Community Infrastructure Levy (CIL) HCC's Planning Obligation Guidance (2008) implements a two-strand approach to planning obligations in order to address the immediate impacts of the new development (first strand), and the cumulative impacts of all development on non-car networks (second strand). The contribution required will be secured via a s106 Agreement.

CONSTRUCTION PHASE

The TA does not contain any information regarding the potential impact on the highway network during the construction of the proposed development. Any subsequent application is required to assess the impacts on traffic flow, safety and parking during the construction of the proposed development.

The proposed priority junction will need to be constructed prior to the start of construction of the proposed residential units. SUMMARY

Overall, the Hertfordshire County Council has no objection to the principle of the proposed development. However, further information regarding the suitability and acceptability of the proposed speed limit on Bedford Road is required before the application can be fully supported.

The analysis in the TA indicates that the additional vehicle trips generated by the proposed development will have a significant impact on the mini roundabout at Ickleford. As a result mitigation measures shall be determined combined with a financial contribution for improvements to sustainable modes of transport will be required to mitigate the impact of additional vehicle trips generated by the proposed development on the local highway network.

The following works will also be required to be completed under a s106 Agreement:

¿ Modifications to the mini roundabout on the A600 at Ickleford to increase capacity, to reduce speed and improve pedestrian and cyclist safety.

APPENDIX D

Report on “Airman” Roundabout by Stuart Michael Associates

Project: Lower Stondon, Central Bedfordshire

SMA Project Ref: 5279

Subject: Operational Assessment of the A507/ A6001, Hitchin Road / B659
Roundabout

Prepared by: R Donoghue Date: 13/04/17

Checked by: M Ohrland Date: 13/04/17

1.0 INTRODUCTION

- 1.1. The purpose of this Technical Note is to summarise an Operational Assessment of the A507/ A6001, Hitchin Road/ B659 roundabout, which has been requested as a result of discussions with Lower Stondon Parish Council. The purpose of the assessment is to review the existing junction capacity and assess the traffic impacts associated with the proposed residential development of 85 dwellings located off Bedford Road, Lower Stondon will have on the Junction during the AM (07:45-08:45) and PM (17:00-18:00) peak periods.
- 1.2. In order to complete this assessment SMA has undertaken the following:
 - Procured a Manual Classified Traffic survey (MCC) of the roundabout, including queue lengths;
 - Prepared junction assessment models for the roundabout, calibrated using queue length data;
 - Reviewed the trip generation and trip distribution from the Transport Assessment (TA) submitted in support of the Outline Planning Application for the site, to determine the predicted additional development trips on the roundabout caused by the development.
 - Assessed the impact that the development generated trips will have on performance on the junction.
- 1.3. This Technical Note sets out the findings of the assessments based on these methods and assumptions.

2.0 REVIEW OF EXISITNG JUNCTION PERFORMANCE

- 2.1. A MCC traffic survey was undertaken by GM Traffic Consultants on Tuesday 4th April 2017. Queue length observations have also been obtained on all approaches to the junction at 5 minute intervals. Full traffic survey results are included in **Appendix A**.
- 2.2. A review of the recorded queues indicates the highest average queue lengths are between 07:45 – 08:45 in the morning and 17:00 – 18:00 in the evening peak periods. In the AM peak

period (07:45-08:45) the average queue lengths have been calculated to be 19.5 vehicles on the A507 (e) Arlesey Road, 5 vehicles on the A6001, Hitchin Road, 22.8 on the A507 (w) and 10.3 vehicles on the B659. Queue lengths during the PM peak period (17:00-18:00) are calculated to be 20 vehicles on the A507 (e), Arlesey Road, 7.9 vehicles on the A6001, Hitchin Road, 18.9 on the A507 (w) and 5 vehicles on the B659.

- 2.3. The MCC data indicates that the PM peak period is currently the busier time period with 2,827 movements passing through the junction compared to 2,773 during the AM peak. In both periods the A507 (e), Arlesey Road is the busiest arm with 36.4% of vehicles approaching the roundabout from this arm in the AM peak period and 44.9% in the PM peak period. The MCC confirms that the predominate junction movements are between the A507 (w) and the A507 (e), Arlesey Road. During the AM peak period, 28.5% of all movements are from the A507 (w) to the A507 (e), Arlesey Road and 24.1% are from the A507 (e), Arlesey Road to the A507 (w). In the PM peak period 26.4% of movements are from A507 (w) to the A507 (e), Arlesey Road and 30.9% of movements are from the A507 (e), Arlesey Road to the A507 (w). Existing 2017 baseline flows are summarised in **Appendix B**.
- 2.4. Junction assessments have been undertaken using **Junctions9** modelling software for the A507/ A6001/ B659 roundabout using the existing flows recorded in the MCC. The junction has also been calibrated using the queue length data. The results are summarised in **Table 2.1**.

	AM 07:45-08:45			PM 17:00-18:00		
	Queue (veh.)	Delay (sec.)	RFC	Queue (veh.)	Delay (sec.)	RFC
A507 (e) Arlesey Road	19.5	64.89	0.98	20.0	53.05	0.98
A6001 Hitchin Road	5.0	60.47	0.86	7.9	84.94	0.94
A507 (w)	22.8	80.31	1.00	18.9	71.82	0.99
B659	10.3	65.62	0.95	5.0	48.66	0.86

Table 2.1 – A507/A6001/B659 Roundabout – 2017 Peak Hour Junction Assessments

- 2.5. The junction modelling confirms that the junction is currently operating at capacity with delays of over a minute on all arms in the AM peak period and comparable delays in the PM peak period. Full output results are provided in **Appendix C**.

3.0 DEVELOPMENT TRAFFIC TRIP GENERATION

- 3.1 In order to assess the impact of the proposed development on the A507/ A6001/ B659 roundabout analysis of the potential traffic generation and its effect on the roundabout has been undertaken.
- 3.2 The predicted trip generation for the development is summarised in **Table 3.1**, which has been taken from the TA.

		Arrivals	Departures	Total
Residential Private	AM Peak Period	14	31	45
	PM Peak Period	31	20	51

Table 3.1 – Proposed Trip Generation

- 3.3 As Table 3.1 summarises, it is predicted that the proposed development could generate 45 two-way movements in during the AM peak with 51 two-way movements in the PM peak.
- 3.4 The trip distribution of development traffic was calculated in the TA using the 'Location of usual residence and place of work' Census Data (2011). As the development will form part of the Lower Stondon village, traffic flows were based on 2011 super output areas - lower layer for the village.
- 3.5 From the obtained Census data, a total of 37.1% of trips to work are to destinations within Central Bedfordshire, with 18.2% within North Hertfordshire. The remaining 44.7% of journeys are to nearby settlements and the wider area, including key destinations such as Luton, Stevenage and London Districts.
- 3.6 In order to determine potential distribution and assignment of development traffic, the likely routing of development traffic was based upon the most logical route from the site to identified destinations. Where more than one route to a particular trip end is possible, this has been split evenly across the network. Potential trip assignment is summarised in **Appendix D**.
- 3.7 The development generated trips at the A507/ A6001/ B659 roundabout have been added to the 2017 baseline flows and the junction has been remodelled. The results of the operational assessment are summarised in **Table 3.2** below. Full output results are provided in **Appendix E**.

	AM 07:45-08:45			PM 17:00-18:00		
	Queue (veh.)	Delay (sec.)	RFC	Queue (veh.)	Delay (sec.)	RFC
A507 (e) Arlesey Road	19.6	65.18	0.99	20.9	55.03	0.98
A6001 Hitchin Road	5.4	63.88	0.87	8.4	88.75	0.95
A507 (w)	23.7	83.06	1.00	19.4	73.65	0.99
B659	10.5	66.90	0.95	5.2	50.15	0.86

Table 3.2 – A507/A6001/B659 Roundabout – Baseline Flows + Development Generated Trips

- 3.8 The junction modelling assessments demonstrate that the junction will continue to operate at capacity, even with the addition of modest development traffic flows.
- 3.9 It is relevant to note, however, that the development proposals would only generate a small number of trips which are likely to use this junction during the peak periods. Based upon the

proposed distribution, the development would generate, a total of 7 two-way trips during the morning peak, with 9 in during the evening peak.

3.10 This equates to an overall increase in the vehicle movements on the roundabout of 0.25% across the AM peak hour and 0.31% in the PM peak. The additional vehicle movements are summarised in **Appendix F**.

3.11 **Table 3.3** provides a summary of the increase in queueing and delay the development generated trips are likely to have upon the A507/ A6001/ B659 roundabout.

	AM 07:45-08:45		PM 17:00-18:00	
	Queue length increase (veh.)	Delay increase (sec.)	Queue length increase (veh.)	Delay increase (sec.)
A507 (e) Arlesey Road	0.1	0.29	0.9	1.98
A6001 Hitchin Road	0.4	3.41	0.5	3.81
A507 (w)	0.9	2.75	0.5	1.83
B659	0.2	1.28	0.2	1.49

Table 3.3 – A507/A6001/B659 Roundabout – Impact of Development Generated Trips

3.12 As table 3.3 indicates, the potential additional movements at the junction will have minimal impact on queue lengths and delay time on each arm, with all arms in both the AM and PM peak period seeing an increase in vehicle queue of less than one vehicle during both peak periods. Delay time will increase from between 0.29-3.41 seconds during the morning and 1.49-3.81 seconds in the evening peak. This overall increase is considered to be insignificant given the existing delay and queueing experienced by drivers at peak times.

4.0 SUMMARY AND CONCLUSION

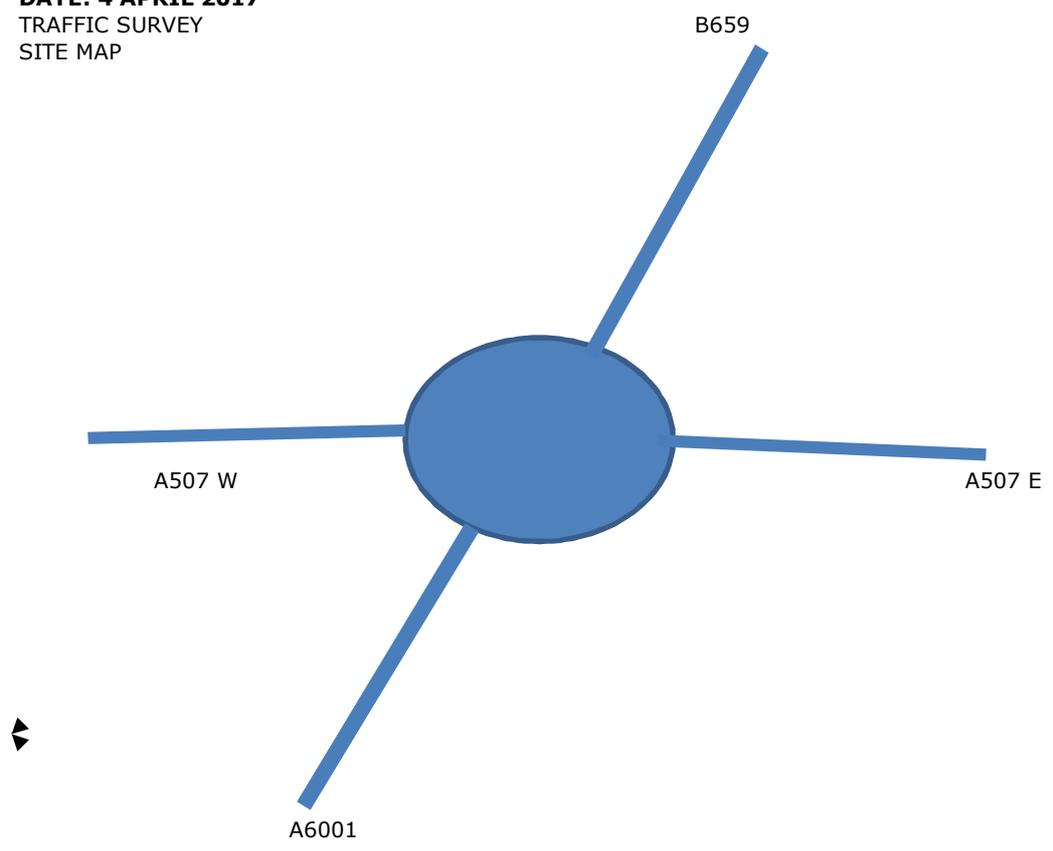
4.1. This Technical Note has been prepared, to assess the operational capacity of the A507/ A6001/B659 roundabout following discussions with Lower Stondon Parish Council, in relation to the proposed development of 85 dwellings located off Bedford Road, Lower Stondon.

4.2. A Manual Classified Count and queue length surveys were recorded at the junction during peak periods and baseline modelling assessments completed. As this technical note confirms, the junction currently operates at it operational capacity during both peak periods.

4.3. The addition of development traffic to the junction has been undertaken, to establish the traffic impacts associated with the development proposals. Based upon the proposed trip rates, distribution and assignments applied within the TA, is it estimated that the development would generate 7 two-way trips during the AM peak (07:45-08:45) and 9 two-way trips during the PM peak period (17:00-18:00).

- 4.4. During the morning peak hour, a total of 2,740 vehicles would pass through this junction, whilst 2,836 vehicles use the junction during the evening peak. On this basis, the proposed development would equate to 0.26% and 0.32% during the AM and PM peaks respectively.
- 4.5. As paragraph 32 of the NPPF states, development proposals should only be refused where the cumulative residual impacts of the proposals are deemed to be severe. As such, based on the proposed trip generation and subsequent traffic impact assessments undertaken, it is considered that the development proposals would not have a severe traffic impact on the junction.

A507/A6001/ B659 RBT LOWER STONDON
DATE: 4 APRIL 2017
TRAFFIC SURVEY
SITE MAP



A507/A6001/ B659 RBT LOWER STONDON
 DATE: 4 APRIL 2017
 TRAFFIC SURVEY
 JUNCTION 1

AM B659	LEFT TO A507 E										THROUGH TO A6001										RIGHT TO A507 W										U-TURN									
	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS
	TIME																																							
07:00 - 07:15	48	5	53	2	0	2	0	3.6	55	34	7	41	0	0	0	1	0	0.0	42	8	2	10	0	0	0	0	0.0	10	0	0	0	0	0	0	0	0.0	0			
07:15 - 07:30	41	14	55	1	0	1	0	1.8	57	43	4	47	0	1	1	0	0	2.1	48	17	0	17	0	0	0	0	0.0	17	0	0	0	0	0	0	0	0.0	0			
07:30 - 07:45	73	4	77	1	1	2	0	2.5	81	44	4	48	0	0	0	1	1	0.0	50	15	5	20	1	0	1	0	4.8	21	0	0	0	0	0	0	0	0.0	0			
07:45 - 08:00	69	7	76	0	1	1	0	1.3	77	31	3	34	1	1	2	1	0	5.6	37	20	3	23	0	0	0	0	0.0	23	0	0	0	0	0	0	0	0.0	0			
08:00 - 08:15	62	5	67	0	0	0	1	0.0	68	37	8	45	1	0	1	0	0	2.2	46	20	2	22	4	0	4	0	15.4	26	0	1	1	0	0	0	0	0.0	1			
08:15 - 08:30	57	5	62	1	1	2	0	3.1	64	35	4	39	1	1	2	0	1	4.9	42	20	0	20	2	0	2	0	9.1	23	0	0	0	0	0	0	0	0.0	0			
08:30 - 08:45	54	4	58	1	1	2	0	3.3	60	41	6	47	0	1	1	0	1	2.1	49	24	3	27	1	2	3	0	10.0	30	0	0	0	0	0	0	0	0.0	0			
08:45 - 09:00	61	2	63	2	1	3	0	4.5	66	46	5	51	2	0	2	0	1	3.8	54	18	6	24	0	0	0	0	0.0	24	1	0	1	0	0	0	0	0.0	1			
09:00 - 09:15	47	4	51	3	1	4	0	7.3	55	39	4	43	2	0	2	0	0	4.4	45	13	3	16	0	0	0	0	0.0	16	0	0	0	0	0	0	0	0.0	0			
09:15 - 09:30	41	8	49	0	0	0	1	0.0	50	40	1	41	0	1	1	0	0	2.4	42	13	4	17	2	0	2	0	10.5	19	0	0	0	0	0	0	0	0.0	0			
09:30 - 09:45	37	4	41	2	1	3	0	6.8	44	21	6	27	1	1	2	0	0	6.9	29	24	4	28	1	0	1	0	3.4	29	0	0	0	0	0	0	0	0.0	0			
09:45 - 10:00	22	3	25	0	0	0	0	0.0	26	24	2	26	1	0	1	0	1	3.7	28	14	1	15	2	0	2	0	11.8	17	1	0	1	0	0	0	0	0.0	1			
HOURL TOTALS																																								
07:00 - 08:00	231	30	261	4	2	6	0	2.2	270	152	18	170	1	2	3	3	1	1.7	177	60	10	70	1	0	1	0	1.4	71	0	0	0	0	0	0	0	0.0	0			
07:15 - 08:15	245	30	275	2	2	4	1	1.4	283	155	19	174	2	2	4	2	1	2.2	181	72	10	82	5	0	5	0	5.7	87	0	1	1	0	0	0	0	0.0	1			
07:30 - 08:30	261	21	282	2	3	5	1	1.7	290	147	19	166	3	2	5	2	2	2.9	175	75	10	85	7	0	7	0	7.6	93	0	1	1	0	0	0	0	0.0	1			
07:45 - 08:45	242	21	263	2	3	5	1	1.9	269	144	21	165	3	3	6	1	2	3.5	174	84	8	92	7	2	9	0	8.9	102	0	1	1	0	0	0	0	0.0	1			
08:00 - 09:00	234	16	250	4	3	7	1	2.7	258	159	23	182	4	2	6	0	3	3.2	191	82	11	93	7	2	9	0	8.8	103	1	1	2	0	0	0	0	0.0	2			
08:15 - 09:15	219	15	234	7	4	11	0	4.5	245	161	19	180	5	2	7	0	3	3.7	190	75	12	87	3	2	5	0	5.4	93	1	0	1	0	0	0	0	0.0	1			
08:30 - 09:30	203	18	221	6	3	9	0	3.9	231	166	16	182	4	2	6	0	2	3.2	190	68	16	84	3	2	5	0	5.6	89	1	0	1	0	0	0	0	0.0	1			
08:45 - 09:45	186	18	204	7	3	10	0	4.7	215	146	16	162	5	2	7	0	1	4.1	170	68	17	85	3	0	3	0	3.4	88	1	0	1	0	0	0	0	0.0	1			
09:00 - 10:00	147	19	166	5	2	7	0	4.0	175	124	13	137	4	2	6	0	1	4.2	144	64	12	76	5	0	5	0	6.2	81	1	0	1	0	0	0	0	0.0	1			

AM A507 E	LEFT TO A6001										THROUGH TO A507 W										RIGHT TO B659										U-TURN									
	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS
	TIME																																							
07:00 - 07:15	20	1	21	1	0	1	0	4.5	22	117	23	140	11	0	11	0	0	7.3	151	14	2	16	1	0	1	0	5.9	17	6	0	6	0	0	0	0	0.0	6			
07:15 - 07:30	17	0	17	0	0	0	1	0.0	18	118	39	157	11	1	12	0	0	7.1	169	10	2	12	0	0	0	0	0.0	12	3	0	3	0	0	0	0	0	0.0	3		
07:30 - 07:45	43	9	52	1	0	1	0	1.9	53	159	32	191	6	0	6	0	1	3.0	198	16	6	22	2	1	3	1	12.0	26	7	3	10	0	0	0	0	0.0	10			
07:45 - 08:00	31	5	36	2	0	2	0	5.3	38	152	28	180	9	0	9	0	0	4.8	189	25	7	32	0	3	3	0	8.6	35	6	1	7	0	0	0	0	0.0	7			
08:00 - 08:15	31	5	36	2	0	2	0	5.3	39	150	22	172	7	0	7	0	1	3.9	180	41	8	49	0	2	2	0	3.9	52	4	1	5	0	0	0	0	0.0	5			
08:15 - 08:30	33	6	39	1	0	1	0	2.5	40	123	30	153	7	3	10	0	0	6.1	163	32	3	35	0	0	2	0	0.0	35	3	2	5	0	0	0	0	0.0	5			
08:30 - 08:45	26	7	33	0	0	0	0	0.0	33	116	19	135	5	0	5	0	1	3.6	141	42	5	47	0	1	1	0	2.1	48	3	1	4	0	0	0	0	0.0	4			
08:45 - 09:00	23	6	29	2	0	2	0	6.5	31	126	22	148	16	0	16	0	1	9.8	165	26	6	32	0	0	0	1	0.0	33	2	0	2	1	0	0	0	33.3	3			
09:00 - 09:15	36	6	42	4	0	4	0	8.7	46	103	19	122	6	0	6	0	0	4.7	128	27	8	35	1	0	1	0	2.8	37	1	1	2	0	0	0	0	0.0	2			
09:15 - 09:30	23	3	26	0	0	0	1	0.0	27	102	20	122	10	0	10	0	1	7.6	133	29	2	31	0	0	0	0	0.0	31	1	0	1	0	0	0	0	0.0	1			
09:30 - 09:45	14	0	14	1	0	1	0	6.7	15	87	13	100	16	0	16	0	0	13.8	116	21	4	25	0	1	1	0	3.8	26	1	0	1	0	0	0	0	0.0	1			
09:45 - 10:00	12	2	14	2	0	2	0	12.5	16	82	12	94	8	0	8	0	1	7.8	103	19	4	23	1	0	1	0	4.2	24	1	1	2	0	0	0	0	0.0	2			
HOURL TOTALS																																								
07:00 - 08:00	111	15	126	4	0	4	1	3.1	131	546	122	668	37	1	38	0	1	5.4	707	65	17	82	3	4	7	1	7.9	90	22	4	26	0	0	0	0	0.0	26			
07:15 - 08:15	122	19	141	5	0	5	1	3.4	148	579	121	700	33	1	34	0	2	4.6	736	92	23	115	2	6	8	1	6.5	125	20	5	25	0	0	0	0	0.0	25			
07:30 - 08:30	138	25	163	6	0	6	0	3.6	170	584	112	696	29	3	32	0	2	4.4	730	114	24	138	2	6	8	1	5.5	148	20	7	27	0	0	0	0	0.0	27			
07:45 - 08:45	121	23	144	5	0	5	0	3.4	150	541	99	640	28	3	31	0	2	4.6	673	140	23	163	0	6	6	0	3.6	170	16	5	21	0	0	0	0	0.0	21			
08:00 - 09:00	113	24	137	5	0	5	0	3.5	143	515	93	608	35	3	38	0	3	5.9	649	141	22	163	0	3	3	0	1.8	168	12	4	16	1	0	0	0	5.9	17			
08:15 - 09:15	118	25	143	7	0	7	0	4.7	150	468	90	558	34	3	37	0	2	6.2	597	127	22	149	1	1	2	0	1.3	153	9	4	13	1	0	0	0	7.1	14			
08:30 - 09:30	108	22	130	6	0	6	1	4.4	137	447	80	527	37	0	37	0	3	6.6	567	124	21	145	1																	

A6001	LEFT TO A507 W										THROUGH TO B659										RIGHT TO A507 E										U-TURN									
	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS
	TIME										TIME										TIME										TIME									
07:00 - 07:15	0	0	0	0	0	0	0	0.0	0	9	1	10	0	0	0	0	0	0.0	10	26	2	28	0	0	0	1	1	0.0	30	0	0	0	0	0	0	0	0.0	0		
07:15 - 07:30	0	0	0	0	0	0	0	0.0	0	17	3	20	0	0	0	0	0	0.0	20	28	7	35	0	0	0	1	0	0.0	36	0	0	0	0	0	0	0	0.0	0		
07:30 - 07:45	0	0	0	0	0	0	0	0.0	0	13	7	20	1	0	0	0	0	4.8	21	18	11	29	1	0	1	0	0	3.3	30	0	0	0	0	0	0	0	0.0	0		
07:45 - 08:00	3	0	3	0	0	0	0	0.0	3	13	4	17	3	2	5	0	0	22.7	22	26	7	33	2	0	2	1	0	5.7	36	1	0	1	0	0	0	0	0.0	1		
08:00 - 08:15	0	1	1	0	0	0	0	0.0	1	19	3	22	0	0	0	0	0	0.0	22	48	11	59	1	0	1	0	0	1.7	60	0	0	0	0	0	0	0	0.0	0		
08:15 - 08:30	0	0	0	0	0	0	0	0.0	0	30	3	33	0	2	2	0	0	5.7	35	38	3	41	0	0	0	0	0	0.0	41	1	0	1	0	0	0	0	0.0	1		
08:30 - 08:45	5	0	5	0	0	0	0	0.0	5	24	4	28	0	0	0	0	0	0.0	28	34	2	36	2	0	2	0	0	5.3	38	0	0	0	0	0	0	0	0.0	0		
08:45 - 09:00	2	0	2	0	0	0	0	0.0	2	23	3	26	0	0	0	0	0	0.0	26	27	5	32	2	0	2	0	0	5.9	34	0	1	1	0	0	0	0	0.0	1		
09:00 - 09:15	2	0	2	0	0	0	0	0.0	2	22	2	24	0	2	2	0	0	7.7	26	26	10	36	1	0	1	0	0	2.7	37	1	0	1	0	0	0	0	0.0	1		
09:15 - 09:30	1	1	2	0	0	0	0	0.0	2	13	7	20	1	1	2	0	0	9.1	22	27	13	40	0	0	0	0	0	0.0	40	0	0	0	0	0	0	0	0.0	0		
09:30 - 09:45	2	0	2	0	0	0	0	0.0	2	21	7	28	1	0	1	0	0	3.4	29	17	10	27	0	0	0	0	0	0.0	27	0	0	0	0	0	0	0	0.0	0		
09:45 - 10:00	1	0	1	0	0	0	0	0.0	1	10	1	11	0	1	1	0	1	8.3	13	21	5	26	2	0	2	0	1	7.1	29	0	0	0	0	0	0	0	0.0	0		
HOURL TOTALS																																								
07:00 - 08:00	3	0	3	0	0	0	0	0.0	3	52	15	67	4	2	6	0	0	8.2	73	98	27	125	3	0	3	2	2	2.3	132	1	0	1	0	0	0	0	0.0	1		
07:15 - 08:15	3	1	4	0	0	0	0	0.0	4	62	17	79	4	2	6	0	0	7.1	85	120	36	156	4	0	4	1	1	2.5	162	1	0	1	0	0	0	0	0.0	1		
07:30 - 08:30	3	1	4	0	0	0	0	0.0	4	75	17	92	4	4	8	0	0	8.0	100	130	32	162	4	0	4	1	0	2.4	167	2	0	2	0	0	0	0	0.0	2		
07:45 - 08:45	8	1	9	0	0	0	0	0.0	9	86	14	100	3	4	7	0	0	6.5	107	146	23	169	5	0	5	1	0	2.9	175	2	0	2	0	0	0	0	0.0	2		
08:00 - 09:00	7	1	8	0	0	0	0	0.0	8	96	13	109	0	2	2	0	0	1.8	111	147	21	168	5	0	5	0	0	2.9	173	1	1	2	0	0	0	0	0.0	2		
08:15 - 09:15	9	0	9	0	0	0	0	0.0	9	99	12	111	0	4	4	0	0	3.5	115	125	20	145	5	0	5	0	0	3.3	150	2	1	3	0	0	0	0	0.0	3		
08:30 - 09:30	10	1	11	0	0	0	0	0.0	11	82	16	98	1	3	4	0	0	3.9	102	114	30	144	5	0	5	0	0	3.4	149	1	1	2	0	0	0	0	0.0	2		
08:45 - 09:45	7	1	8	0	0	0	0	0.0	8	79	19	98	2	3	5	0	0	4.9	103	97	38	135	3	0	3	0	0	2.2	138	1	1	2	0	0	0	0	0.0	2		
09:00 - 10:00	6	1	7	0	0	0	0	0.0	7	66	17	83	2	4	6	0	1	6.7	90	91	38	129	3	0	3	0	1	2.3	133	1	0	1	0	0	0	0	0.0	1		

A507 W	LEFT TO B659										THROUGH TO A507 E										RIGHT TO A6001										U-TURN									
	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS
	TIME										TIME										TIME										TIME									
07:00 - 07:15	9	0	9	0	0	0	0	0.0	10	188	38	226	15	0	15	0	0	6.2	241	1	0	1	0	0	0	0	0.0	1	0	0	0	0	0	0	0	0.0	0			
07:15 - 07:30	11	7	18	0	0	0	0	0.0	19	176	34	210	22	0	22	0	0	9.5	232	5	2	7	0	0	0	0	0	0.0	7	0	1	1	0	0	0	0	0.0	1		
07:30 - 07:45	8	3	11	1	0	1	1	8.3	14	207	30	237	14	0	14	0	0	5.6	251	6	0	6	0	0	0	0	0	0.0	6	0	0	0	0	0	0	0	0.0	0		
07:45 - 08:00	14	7	21	0	0	0	0	0.0	22	192	28	220	21	0	21	0	0	8.7	241	19	3	22	0	0	0	0	0	0.0	22	1	0	1	0	0	0	0	0.0	1		
08:00 - 08:15	8	2	10	0	0	0	0	0.0	12	135	18	153	14	0	14	0	0	8.4	167	17	4	21	1	0	1	0	0	4.5	22	0	0	0	0	0	0	0	0.0	0		
08:15 - 08:30	13	0	13	2	2	4	0	23.5	20	158	22	180	23	1	24	0	2	11.8	206	19	0	19	1	0	1	0	0	5.0	20	0	0	0	0	0	0	0	0.0	0		
08:30 - 08:45	9	3	12	1	0	1	0	7.7	15	137	22	159	20	0	20	0	1	11.2	180	13	0	13	0	0	0	0	0	0.0	13	0	0	0	0	0	0	0	0.0	0		
08:45 - 09:00	10	2	12	0	0	0	0	0.0	12	160	24	184	18	3	21	0	0	10.2	205	13	5	18	1	0	1	0	0	5.3	19	0	0	0	0	0	0	0	0.0	0		
09:00 - 09:15	21	3	24	2	0	2	0	7.7	26	150	21	171	25	2	27	1	1	13.6	200	3	1	4	0	0	0	0	0	0.0	4	0	0	0	0	0	0	0	0.0	0		
09:15 - 09:30	20	6	26	0	0	0	0	0.0	26	109	22	131	8	0	8	0	1	5.8	140	1	0	1	0	0	0	0	0	0.0	1	0	0	0	0	0	0	0	0.0	0		
09:30 - 09:45	26	2	28	2	0	2	0	6.7	30	93	17	110	12	0	12	0	0	9.8	122	1	2	3	0	0	0	0	0	0.0	3	0	0	0	0	0	0	0	0.0	0		
09:45 - 10:00	10	1	11	0	1	1	0	8.3	12	86	22	108	9	1	10	0	0	8.5	118	4	0	4	0	0	0	0	0	0.0	4	0	0	0	0	0	0	0	0.0	0		
HOURL TOTALS																																								
07:00 - 08:00	42	17	59	1	0	1	1	4	1.7	65	763	130	893	72	0	72	0	7.5	965	31	5	36	0	0	0	0	0	0.0	36	1	1	2	0	0	0	0	0.0	2		
07:15 - 08:15	41	19	60	1	0	1	1	5	1.6	67	710	110	820	71	0	71	0	8.0	891	47	9	56	1	0	1	0	0	1.8	57	1	1	2	0	0	0	0	0.0	2		
07:30 - 08:30	43	12	55	3	2	5	1	7	8.3	68	692	98	790	72	1	73	0	2	8.5	865	61	7	68	2	0	2	0	2.9	70	1	0	1	0	0	0	0	0.0	1		
07:45 - 08:45	44	12	56	3	2	5	0	8	8.2	69	622	90	712	78	1	79	0	3	10.0	794	68	7	75	2	0	2	0	2.6	77	1	0	1	0	0	0	0	0.0	1		
08:00 - 09:00	40	7	47	3	2	5	0	7	9.6	59	590	86	676	75	4	79	0	3	10.5	758	62	9	71	3	0	3	0	4.1	74	0	0	0	0	0	0	0	0.0	0		
08:15 - 09:15	53	8	61	5	2	7	0	5	10.3	73	605	89	694	86	6	92	1	4	11.7	791	48	6	54	2	0	2	0	3.6	56	0	0	0	0	0	0	0	0.0	0		
08:30 - 09:30	60	14	74	3	0	3	0	2	3.9	79	556	89	645	71	5	76	1	3	10.5	725	30	6	36	1	0	1														

A507/A6001/ B659 RBT LOWER STONDON
DATE: 4 APRIL 2017
 TRAFFIC SURVEY
 JUNCTION 1

B659	LEFT TO A507 E										THROUGH TO A6001										RIGHT TO A507 W										U-TURN									
	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS
	TIME																																							
16:00 - 16:15	7	1	8	0	1	1	0	0	11.1	9	36	7	43	1	0	1	0	0	2.3	44	5	0	5	0	0	0	0	0.0	5	0	0	0	0	0	0	0	0.0	0		
16:15 - 16:30	10	2	12	0	0	0	0	0.0	12	49	5	54	1	0	1	1	0	1.8	56	8	2	10	0	0	0	1	0.0	11	0	0	0	0	0	0	0	0.0	0			
16:30 - 16:45	5	2	7	0	0	0	0	0.0	7	8	44	12	56	0	0	0	0	0.0	56	9	1	10	0	0	0	0	0.0	10	0	0	0	0	0	0	0	0.0	0			
16:45 - 17:00	11	2	13	1	0	1	2	0	7.1	16	39	6	45	2	0	2	0	1	4.3	48	7	3	10	0	0	0	1	0.0	11	0	0	0	0	0	0	0	0.0	0		
17:00 - 17:15	22	3	25	0	0	0	0	0.0	25	49	6	55	0	0	0	0	0	0.0	55	10	1	11	0	0	0	1	0.0	12	0	0	0	1	0	0	0	100.0	1			
17:15 - 17:30	16	0	16	0	0	0	0	1	0.0	17	58	7	65	0	0	0	1	0	0.0	66	4	2	6	0	0	0	0	0.0	6	2	1	3	0	0	0	0	0.0	3		
17:30 - 17:45	19	1	20	1	0	1	1	0	4.8	22	51	6	57	1	0	1	0	1	1.7	59	12	2	14	0	0	0	0	0.0	14	0	0	0	0	0	0	0	0.0	0		
17:45 - 18:00	15	3	18	0	0	0	0	0.0	18	47	5	52	0	0	0	0	0	0.0	52	9	5	14	0	0	0	0	0.0	14	0	0	0	0	0	0	0	0.0	0			
18:00 - 18:15	19	1	20	0	0	0	0	1	0.0	21	65	9	74	1	0	1	0	0	1.3	75	6	0	6	0	0	0	0	0.0	6	1	0	1	0	0	0	0	0.0	1		
18:15 - 18:30	15	1	16	0	0	0	0	0.0	16	67	4	71	0	0	0	0	0	0.0	71	14	1	15	0	0	0	1	1	0.0	17	0	0	0	0	0	0	0	0.0	0		
18:30 - 18:45	12	4	16	0	0	0	0	0.0	16	51	7	58	0	0	0	1	0	0.0	59	8	3	11	0	0	0	0	0.0	11	0	0	0	0	0	0	0	0.0	0			
18:45 - 19:00	12	3	15	0	0	0	0	0.0	15	48	3	51	0	0	0	0	0	0.0	51	11	3	14	0	0	0	0	0.0	14	1	0	1	0	0	0	0	0.0	1			
HOURL TOTALS																																								
16:00 - 17:00	33	7	40	1	1	2	3	0	4.8	45	168	30	198	4	0	4	1	1	2.0	204	29	6	35	0	0	0	2	0.0	37	0	0	0	0	0	0	0	0.0	0		
16:15 - 17:15	48	9	57	1	0	1	3	0	1.7	61	181	29	210	3	0	3	1	1	1.4	215	34	7	41	0	0	0	1	2	0.0	44	0	0	0	1	0	0	0	100.0	1	
16:30 - 17:30	54	7	61	1	0	1	3	1	1.6	66	190	31	221	2	0	2	1	1	0.9	225	30	7	37	0	0	0	1	1	0.0	39	2	1	3	1	0	1	0	25.0	4	
16:45 - 17:45	68	6	74	2	0	2	3	1	2.6	80	197	25	222	3	0	3	1	2	1.3	232	33	8	41	0	0	0	1	1	0.0	43	2	1	3	1	0	1	0	25.0	4	
17:00 - 18:00	72	7	79	1	0	1	1	1	1.3	82	205	24	229	1	0	1	1	1	0.4	232	35	10	45	0	0	0	1	0	0.0	46	2	1	3	1	0	1	0	25.0	4	
17:15 - 18:15	69	5	74	1	0	1	1	2	1.3	78	221	27	248	2	0	2	1	1	0.8	252	31	9	40	0	0	0	0	0.0	40	3	1	4	0	0	0	0	0.0	4		
17:30 - 18:30	68	6	74	1	0	1	1	1	1.3	77	230	24	254	2	0	2	0	1	0.8	257	41	8	49	0	0	0	1	1	0.0	51	1	0	1	0	0	0	0	0.0	1	
17:45 - 18:45	61	9	70	0	0	0	0	1	0.0	71	230	25	255	1	0	1	1	0	0.4	257	37	9	46	0	0	0	1	1	0.0	48	1	0	1	0	0	0	0	0.0	1	
18:00 - 19:00	58	9	67	0	0	0	0	1	0.0	68	231	23	254	1	0	1	1	0	0.4	256	39	7	46	0	0	0	1	1	0.0	48	2	0	2	0	0	0	0	0.0	2	

A507 E	LEFT TO A6001										THROUGH TO A507 W										RIGHT TO B659										U-TURN									
	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS
	TIME																																							
16:00 - 16:15	37	7	44	0	0	0	0	1	0.0	45	140	37	177	9	1	10	0	0	5.3	187	36	3	39	0	0	0	0	1	0.0	40	2	0	2	0	0	0	0	0.0	2	
16:15 - 16:30	26	4	30	0	0	0	0	0	0.0	30	150	34	184	7	0	7	0	0	3.7	191	37	8	45	2	0	2	0	0	4.3	47	3	2	5	0	0	0	0	0.0	5	
16:30 - 16:45	23	8	31	3	0	3	0	0	8.8	34	152	30	182	6	1	7	0	2	3.7	191	35	9	44	3	1	4	0	0	8.3	48	2	0	2	0	0	0	0	0.0	2	
16:45 - 17:00	30	8	38	2	0	2	0	1	5.0	41	135	36	171	5	0	5	0	1	2.8	177	53	11	64	0	0	0	0	0.0	64	2	0	2	0	0	0	0	0.0	2		
17:00 - 17:15	49	9	58	0	0	0	0	0.0	58	169	29	198	3	0	3	0	0	1.5	201	41	6	47	1	0	1	0	1	2.1	49	1	0	1	0	0	0	0	0.0	1		
17:15 - 17:30	35	6	41	0	0	0	1	1	0.0	43	188	22	210	5	0	5	0	1	2.3	216	42	9	50	2	0	2	0	1	3.8	53	3	0	3	0	0	0	0	0.0	3	
17:30 - 17:45	34	5	39	1	0	1	1	0	2.5	41	192	26	218	2	0	2	0	1	0.9	221	51	9	60	1	1	2	0	1	3.2	63	2	0	2	0	0	0	0	0.0	2	
17:45 - 18:00	32	7	39	0	0	0	0	0	0.0	39	211	18	229	7	0	7	0	1	3.0	237	48	2	50	1	0	1	1	0	2.0	52	3	0	3	0	0	0	0	0.0	3	
18:00 - 18:15	29	2	31	0	0	0	0	1	0.0	32	197	21	218	4	0	4	0	3	1.8	225	45	6	51	1	0	1	0	2	1.9	54	2	0	2	0	0	0	0	0.0	2	
18:15 - 18:30	37	2	39	1	0	1	0	0	2.5	40	178	11	189	5	0	5	0	1	2.6	195	52	6	58	1	0	1	1	0	1.7	60	1	0	1	0	0	0	0	0.0	1	
18:30 - 18:45	32	0	32	0	0	0	0	2	0.0	34	134	10	144	6	0	6	0	1	4.0	151	44	2	46	0	1	1	0	0	2.1	47	2	0	2	0	0	0	0	0.0	2	
18:45 - 19:00	31	3	34	0	0	0	0	0	0.0	34	129	14	143	3	0	3	0	1	2.1	147	43	4	47	0	0	0	0	0.0	47	8	0	8	0	0	0	0	0.0	8		
HOURL TOTALS																																								
16:00 - 17:00	116	27	143	5	0	5	0	2	3.4	150	577	137	714	27	2	29	0	3	3.9	746	161	31	192	5	1	6	0	1	3.0	199	9	2	11	0	0	0	0	0.0	11	
16:15 - 17:15	128	29	157	5	0	5	0	1	3.1	163	606	129	735	21	1	22	0	3	2.9	760	166	34	200	6	1	7	0	1	3.4	208	8	2	10	0	0	0	0	0.0	10	
16:30 - 17:30	137	31	168	5	0	5	1	2	2.9	176	644	117	761	19	1	20	0	4	2.6	785	171	34	205	6	1	7	0	2	3.3	214	8	0	8	0	0	0	0	0.0	8	
16:45 - 17:45	148	28	176	3	0	3	2	2	1.7	183	684	113	797	15	0	15	0	3	1.8	815	187	34	221	4	1	5	0	3	2.2	229	8	0	8	0	0	0	0	0.0	8	
17:00 - 18:00	150	27	177	1	0	1	2	1	0.6	181	760	95	855	17	0	17	0	3	1.9	875	182	25	207	5	1	6	1	3	2.8	217	9	0	9	0	0	0	0	0.0	9	
17:15 - 18:15	130	20	150	1	0	1	2	2	0.7	155	788	87	875	18	0	18	0	6	2.0	899	186	25	211	5	1	6	1	4	2.8											

A6001	LEFT TO A507 W										THROUGH TO B659										RIGHT TO A507 E										U-TURN									
	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS
	TIME																																							
16:00 - 16:15	4	4	8	0	0	0	0	0.0	8	29	4	33	0	1	1	0	1	2.9	35	26	2	28	1	0	1	0	0	3.4	29	0	0	0	0	0	0	0.0	0			
16:15 - 16:30	2	1	3	0	0	0	0	0.0	3	31	5	36	1	1	2	0	0	5.3	38	20	9	29	1	1	2	0	0	6.5	32	0	0	0	0	0	0	0.0	0			
16:30 - 16:45	2	1	3	0	0	0	0	0.0	3	32	3	35	0	0	0	0	0	0.0	35	26	6	32	0	0	0	0	0	0.0	32	0	0	0	0	0	0	0.0	0			
16:45 - 17:00	4	2	6	0	0	0	0	0.0	6	36	5	41	1	0	1	0	0	2.4	42	32	8	40	2	0	2	0	0	4.8	42	0	1	1	0	0	0	0.0	1			
17:00 - 17:15	3	0	3	0	0	0	0	0.0	3	27	4	31	0	1	1	0	0	3.1	33	40	6	46	0	0	0	0	1	0.0	47	1	0	1	0	0	0	0.0	1			
17:15 - 17:30	2	0	2	0	0	0	0	0.0	2	34	9	43	0	1	1	0	1	2.3	45	29	6	35	0	0	0	0	0	0.0	35	2	0	2	0	0	0	0.0	2			
17:30 - 17:45	8	0	8	0	0	0	0	0.0	8	38	5	43	0	1	1	0	0	2.3	44	29	10	39	0	0	0	1	0	0.0	40	1	0	1	0	0	0	0.0	1			
17:45 - 18:00	7	1	8	0	0	0	0	0.0	8	35	4	39	0	0	0	0	0	0.0	39	15	3	18	0	0	0	0	0	0.0	18	0	0	0	0	0	0	0.0	0			
18:00 - 18:15	2	0	2	0	0	0	0	0.0	2	44	3	47	0	1	1	0	0	2.1	48	18	3	21	0	0	0	0	1	0.0	22	0	0	0	0	0	0	0.0	0			
18:15 - 18:30	2	0	2	0	0	0	0	0.0	2	44	1	45	0	1	1	0	0	2.2	46	17	2	19	0	0	0	0	0	0.0	19	1	0	1	0	0	0	0.0	1			
18:30 - 18:45	3	0	3	0	0	0	0	0.0	3	27	3	30	0	0	0	1	0	0.0	31	27	1	28	0	0	0	0	0	0.0	28	0	0	0	0	0	0	0.0	0			
18:45 - 19:00	2	0	2	0	0	0	0	0.0	2	26	6	32	0	0	0	4	1	0.0	37	10	3	13	0	0	0	1	0	0.0	14	0	0	0	0	0	0	0.0	0			
HOURLY TOTALS																																								
16:00 - 17:00	12	8	20	0	0	0	0	0.0	20	128	17	145	2	2	4	0	1	2.7	150	104	25	129	4	1	5	1	0	3.7	135	0	1	1	0	0	0	0.0	1			
16:15 - 17:15	11	4	15	0	0	0	0	0.0	15	126	17	143	2	2	4	1	0	2.7	148	118	29	147	3	1	4	1	1	2.6	153	1	1	2	0	0	0	0.0	2			
16:30 - 17:30	11	3	14	0	0	0	0	0.0	14	129	21	150	1	2	3	1	1	2.0	155	127	26	153	2	0	2	0	1	1.3	156	3	1	4	0	0	0	0.0	4			
16:45 - 17:45	17	2	19	0	0	0	0	0.0	19	135	23	158	1	3	4	1	1	2.5	164	130	30	160	2	0	2	1	1	1.2	164	4	1	5	0	0	0	0.0	5			
17:00 - 18:00	20	1	21	0	0	0	0	0.0	21	134	22	156	0	3	3	1	1	1.9	161	113	25	138	0	0	0	1	1	0.0	140	4	0	4	0	0	0	0.0	4			
17:15 - 18:15	19	1	20	0	0	0	0	0.0	20	151	21	172	0	3	3	0	1	1.7	176	91	22	113	0	0	0	1	1	0.0	115	3	0	3	0	0	0	0.0	3			
17:30 - 18:30	19	1	20	0	0	0	0	0.0	20	161	13	174	0	3	3	0	0	1.7	177	79	18	97	0	0	0	1	1	0.0	99	2	0	2	0	0	0	0.0	2			
17:45 - 18:45	14	1	15	0	0	0	0	0.0	15	150	11	161	0	2	2	1	0	1.2	164	77	9	86	0	0	0	0	1	0.0	87	1	0	1	0	0	0	0.0	1			
18:00 - 19:00	9	0	9	0	0	0	0	0.0	9	141	13	154	0	2	2	5	1	1.3	162	72	9	81	0	0	0	1	1	0.0	83	1	0	1	0	0	0	0.0	1			

A507 W	LEFT TO B659										THROUGH TO A507 E										RIGHT TO A6001										U-TURN									
	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS	CARS	LIGHT GOODS VEHICLES	TOTAL LIGHT	HEAVYS	BUSES AND COACHES	TOTAL HEAVY	PEDAL-CYCLES	MOTORCYCLES	HEAVY %	TOTAL MOVEMENTS
	TIME																																							
16:00 - 16:15	22	3	25	0	0	0	0	0.0	25	134	30	164	15	2	17	0	0	9.4	181	1	4	5	0	0	0	0	0	0.0	5	0	0	0	0	0	0	0.0	0			
16:15 - 16:30	26	3	29	0	0	0	0	0.0	30	119	23	142	5	1	6	0	0	4.1	148	3	2	3	0	0	0	0	0	0.0	3	0	0	0	0	0	0	0.0	0			
16:30 - 16:45	22	2	24	2	0	2	0	7.7	26	153	23	176	8	0	8	0	0	4.3	184	3	2	5	0	0	0	0	0	0.0	5	1	0	1	0	0	0	0.0	1			
16:45 - 17:00	12	2	14	0	0	0	0	0.0	14	126	26	152	3	0	3	0	0	1.9	155	1	3	4	0	0	0	0	0	0.0	4	0	0	0	0	0	0	0.0	0			
17:00 - 17:15	31	1	32	0	0	0	0	0.0	32	166	17	183	2	0	2	0	2	1.1	187	3	1	4	0	0	0	0	0	0.0	4	0	0	1	0	0	0	0.0	1			
17:15 - 17:30	24	3	27	1	0	1	0	3.6	28	163	22	185	2	0	2	0	0	1.1	187	3	1	4	0	0	0	0	0	0.0	4	0	0	0	0	0	0	0.0	0			
17:30 - 17:45	24	1	25	0	0	0	0	0.0	25	154	25	179	4	0	4	0	0	2.2	183	3	3	6	0	0	0	0	0	0.0	6	0	0	0	0	0	0	0.0	0			
17:45 - 18:00	18	4	22	2	0	2	0	8.3	24	165	16	181	10	0	10	0	0	5.2	191	2	2	4	0	0	0	0	0	0.0	4	0	0	0	0	0	0	0.0	0			
18:00 - 18:15	26	0	26	0	0	0	0	0.0	26	139	13	152	2	0	2	0	1	1.3	155	0	1	1	0	0	0	0	0	0.0	1	1	0	1	0	0	0	0.0	1			
18:15 - 18:30	25	2	27	1	0	1	0	3.6	28	161	11	172	2	0	2	0	1	1.1	175	1	1	2	0	0	0	0	0	0.0	2	0	0	0	0	0	0	0.0	0			
18:30 - 18:45	19	3	22	0	0	0	0	0.0	22	113	9	122	5	0	5	0	1	3.9	128	0	1	1	0	0	0	0	0	0.0	1	1	0	1	0	0	0	0.0	1			
18:45 - 19:00	22	0	22	0	0	0	0	0.0	22	135	8	143	0	0	0	0	1	0.0	144	1	0	1	0	0	0	0	0	0.0	1	0	0	0	0	0	0	0.0	0			
HOURLY TOTALS																																								
16:00 - 17:00	82	10	92	2	0	2	0	2.1	95	532	102	634	31	3	34	0	0	5.1	668	6	11	17	0	0	0	0	0	0.0	17	1	0	1	0	0	0	0.0	1			
16:15 - 17:15	91	8	99	2	0	2	0	2.0	102	564	89	653	18	1	19	0	2	2.8	674	10	8	16	0	0	0	0	0	0.0	16	1	1	2	0	0	0	0.0	2			
16:30 - 17:30	89	8	97	3	0	3	0	3.0	100	608	88	696	15	0	15	0	2	2.1	713	8	7	17	0	0	0	0	0	0.0	17	1	1	2	0	0	0	0.0	2			
16:45 - 17:45	91	7	98	1	0	1	0	1.0	99	609	90	699	11	0	11	0	2	1.5	712	10	8	18	0	0	0	0	0	0.0	18	0	1	1	0	0	0	0.0	1			
17:00 - 18:00	97	9	106	3	0	3	0	2.8	109	648	80	728	18	0	18	0	2	2.4	748	11	7	18	0	0	0	0	0	0.0	18	0	1	1	0	0	0	0.0	1			
17:15 - 18:15	92	8	100	3	0	3	0	2.9	103	621	76	697	18	0	18	0	1	2.5	716	8	7	15	0	0	0	0	0	0.0	15	1	0	1	0	0	0	0.0	1			
17:30 - 18:30	93	7	100	3	0	3	0	2.9	103	619	65	684	18	0	18	0	2	2.6	704	6	7	13	0	0	0	0	0	0.0	13	1	0	1	0	0	0	0.0	1			
17:45 - 18:45	88	9	97	3	0	3	0	3.0	100	578	49	627	19	0	19	0	3	2.9	649	3	5	8	0	0	0															

A507/A6001/ B659 RBT LOWER STONDON
DATE: 4 APRIL 2017

TIME	B659
7:00	8
7:05	7
7:10	3
7:15	8
7:20	5
7:25	8
7:30	12
7:35	16
7:40	24
7:45	18
7:50	16
7:55	8
8:00	10
8:05	12
8:10	8
8:15	11
8:20	4
8:25	8
8:30	9
8:35	12
8:40	7
8:45	11
8:50	8
8:55	12
9:00	9
9:05	5
9:10	3
9:15	4
9:20	6
9:25	4
9:30	3
9:35	5
9:40	4
9:45	4
9:50	5
9:55	4

TIME	A507 E
7:00	7
7:05	9
7:10	16
7:15	11
7:20	24
7:25	12
7:30	15
7:35	24+
7:40	24+
7:45	24+
7:50	24+
7:55	24+
8:00	24+
8:05	24+
8:10	24+
8:15	24+
8:20	12
8:25	15
8:30	19
8:35	8
8:40	12
8:45	16
8:50	9
8:55	24+
9:00	11
9:05	15
9:10	8
9:15	9
9:20	13
9:25	7
9:30	8
9:35	2
9:40	5
9:45	0
9:50	3
9:55	0

TIME	A6001
7:00	4
7:05	3
7:10	3
7:15	5
7:20	7
7:25	5
7:30	5
7:35	4
7:40	6
7:45	5
7:50	7
7:55	4
8:00	5
8:05	7
8:10	5
8:15	6
8:20	6
8:25	3
8:30	4
8:35	5
8:40	3
8:45	8
8:50	4
8:55	5
9:00	3
9:05	4
9:10	5
9:15	4
9:20	4
9:25	3
9:30	4
9:35	7
9:40	2
9:45	2
9:50	0
9:55	2

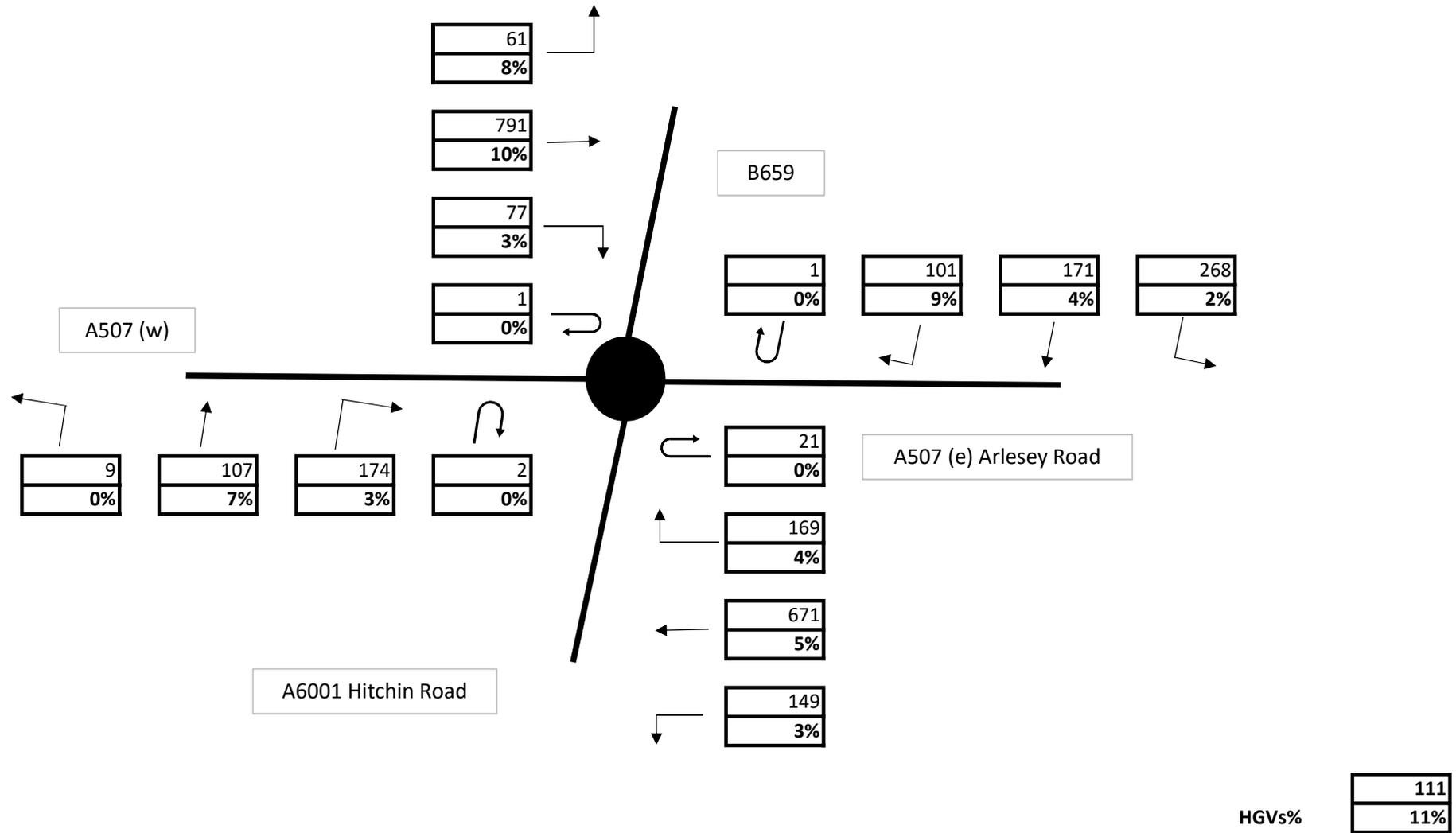
TIME	A507 W
7:00	22
7:05	24+
7:10	7
7:15	4
7:20	12
7:25	12
7:30	24+
7:35	11
7:40	24+
7:45	24+
7:50	24+
7:55	24+
8:00	24+
8:05	24+
8:10	24+
8:15	24+
8:20	24+
8:25	18
8:30	24+
8:35	24+
8:40	15
8:45	22
8:50	23
8:55	23
9:00	16
9:05	18
9:10	14
9:15	16
9:20	11
9:25	9
9:30	5
9:35	7
9:40	8
9:45	7
9:50	11
9:55	5

TIME	B659
16:00	5
16:05	4
16:10	3
16:15	16
16:20	9
16:25	6
16:30	2
16:35	8
16:40	4
16:45	3
16:50	2
16:55	5
17:00	4
17:05	3
17:10	6
17:15	4
17:20	4
17:25	5
17:30	3
17:35	6
17:40	9
17:45	6
17:50	5
17:55	5
18:00	4
18:05	4
18:10	2
18:15	3
18:20	2
18:25	2
18:30	3
18:35	2
18:40	3
18:45	0
18:50	3
18:55	3

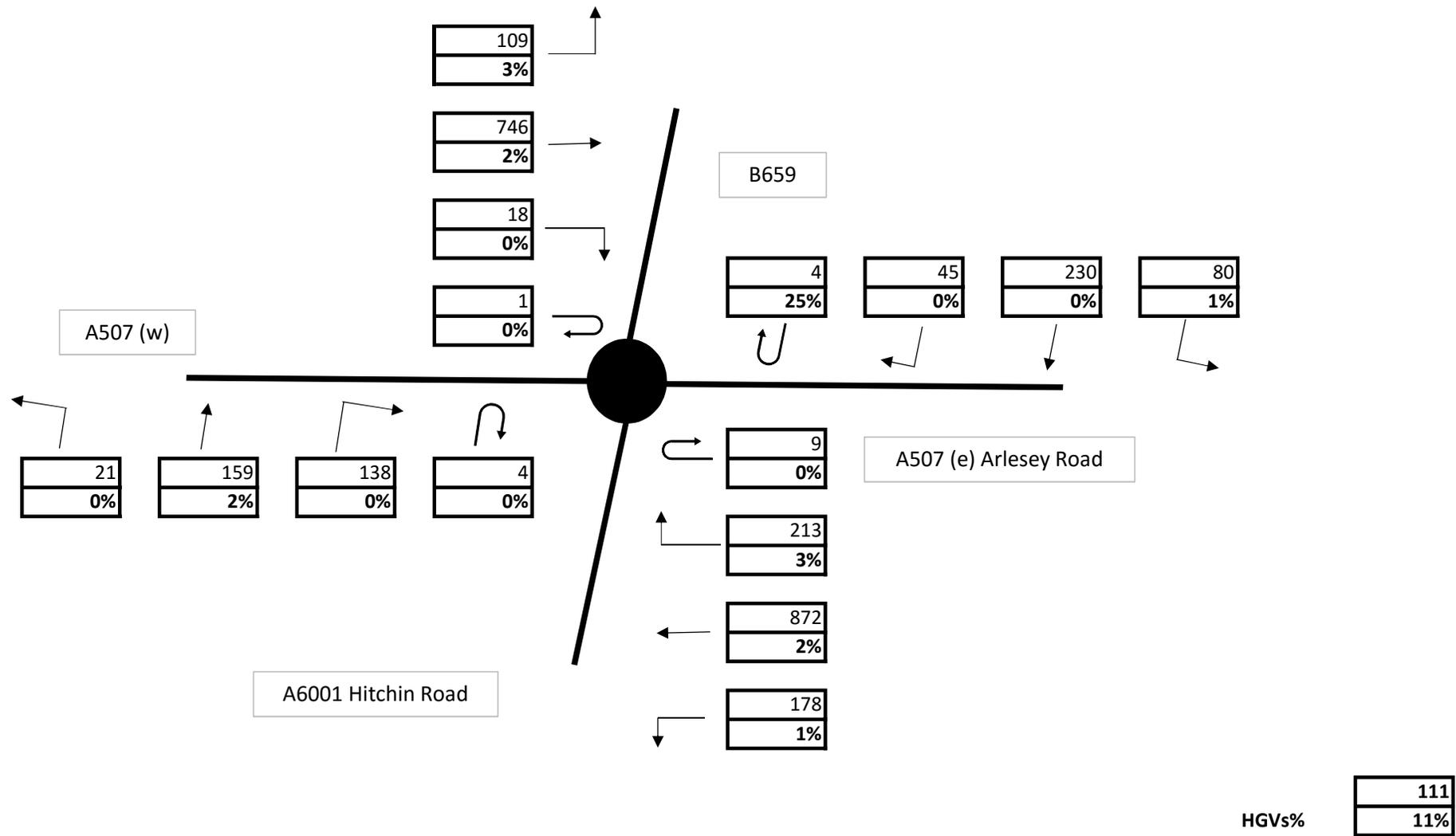
TIME	A507 E
16:00	16
16:05	20
16:10	7
16:15	15
16:20	21
16:25	11
16:30	9
16:35	16
16:40	24
16:45	6
16:50	10
16:55	8
17:00	17
17:05	19
17:10	8
17:15	12
17:20	23
17:25	24+
17:30	24+
17:35	24+
17:40	24+
17:45	24+
17:50	17
17:55	24+
18:00	11
18:05	18
18:10	4
18:15	5
18:20	9
18:25	13
18:30	6
18:35	2
18:40	0
18:45	2
18:50	4
18:55	8

TIME	A6001
16:00	7
16:05	2
16:10	2
16:15	12
16:20	7
16:25	7
16:30	8
16:35	8
16:40	4
16:45	7
16:50	6
16:55	6
17:00	6
17:05	9
17:10	5
17:15	5
17:20	14
17:25	18
17:30	9
17:35	6
17:40	4
17:45	6
17:50	7
17:55	6
18:00	6
18:05	8
18:10	7
18:15	8
18:20	3
18:25	2
18:30	3
18:35	6
18:40	2
18:45	0
18:50	2
18:55	3

TIME	A507 W
16:00	23
16:05	14
16:10	9
16:15	4
16:20	10
16:25	6
16:30	4
16:35	10
16:40	9
16:45	8
16:50	10
16:55	14
17:00	8
17:05	11
17:10	24
17:15	16
17:20	12
17:25	24+
17:30	24+
17:35	23
17:40	24+
17:45	24+
17:50	14
17:55	23
18:00	14
18:05	9
18:10	5
18:15	24
18:20	9
18:25	5
18:30	2
18:35	3
18:40	3
18:45	2
18:50	0
18:55	6



Appendix B - 2017 AM Peak Period (07:45-08:45) Baseline Traffic Flows



2017 PM Peak Period (17:00-18:00) Baseline Traffic Flows

<h1>Junctions 9</h1>
<h2>ARCADY 9 - Roundabout Module</h2>
Version: 9.0.1.4646 [] © Copyright TRL Limited, 2017
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Filename: A507 A6001 B659 RBT AM calibration.j9

Path: M:\Project\5200 to 5299\5279 - Lower Stondon\Junction Calcs April 2017\2017 A507 A6001 B659

Report generation date: 12/04/2017 11:30:40

«2017, AM

- »Junction Network
- »Arms
- »Traffic Demand
- »Origin-Destination Data
- »Vehicle Mix
- »Results

Summary of junction performance

AM					
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
2017					
Arm 1	19.5	64.89	0.98	F	-8 % [Arm 3]
Arm 2	5.0	60.47	0.86	F	
Arm 3	22.8	80.31	1.00	F	
Arm 4	10.3	65.52	0.95	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	A507/ Hitchin Road/ B659 Roundabout
Location	South of Henlow (near Lower Stondon)
Site number	5279
Date	10/04/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	SM/rpwd
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)

5.75			✓	Delay	0.85	36.00	20.00
------	--	--	---	-------	------	-------	-------

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2017, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1,2,3,4	69.72	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-8	Arm 3

Arms

Arms

Arm	Name	Description
1	A507 (e) Arlesey Road	
2	A6001 Hitchin Road	
3	A507 (w)	
4	B659 (n) Hitchin Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.40	8.00	7.4	54.3	39.1	15.0	
2	3.50	5.90	12.6	8.9	39.1	37.0	
3	4.10	7.90	7.5	70.8	39.1	17.0	
4	4.10	7.40	10.3	12.7	39.1	39.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.710	1906
2	0.555	1383
3	0.692	1816
4	0.611	1630

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Direct capacity adjustment (PCU/hr)
1	Direct		-506
2	Direct		-433
3	Direct		-437
4	Direct		-301

Traffic Demand

Demand Set Details

Scenario	Time Period	Traffic profile	Start time	Finish time	Time segment length	Run
----------	-------------	-----------------	------------	-------------	---------------------	-----

ID	name	name	type	(HH:mm)	(HH:mm)	(min)	automatically
D1	2017	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1010	100.000
2		ONE HOUR	✓	292	100.000
3		ONE HOUR	✓	930	100.000
4		ONE HOUR	✓	541	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	21	149	671	169
	2	174	2	9	107
	3	791	77	1	61
	4	268	171	101	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	3	5	4
	2	3	0	0	3
	3	10	3	0	8
	4	2	4	9	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.98	64.89	19.5	F	927	1390
2	0.86	60.47	5.0	F	268	402
3	1.00	80.31	22.8	F	853	1280
4	0.95	65.52	10.3	F	496	745

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	760	190	263	1213	0.627	754	935	0.0	1.7	8.048	A
2	220	55	719	551	0.399	217	298	0.0	0.7	10.975	B
3	700	175	353	1135	0.617	693	583	0.0	1.7	8.766	A
4	407	102	794	843	0.483	403	252	0.0	1.0	8.413	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	908	227	315	1176	0.772	902	1118	1.7	3.3	13.340	B
2	263	66	860	473	0.555	260	356	0.7	1.2	17.186	C
3	836	209	423	1087	0.769	829	698	1.7	3.4	14.865	B
4	486	122	951	748	0.650	483	302	1.0	1.8	13.887	B

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1112	278	373	1135	0.980	1068	1320	3.3	14.3	41.004	E
2	321	80	1020	385	0.835	310	421	1.2	4.0	44.407	E
3	1024	256	503	1032	0.993	975	827	3.4	15.7	48.050	E
4	596	149	1120	644	0.925	573	357	1.8	7.6	42.948	E

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1112	278	381	1129	0.985	1091	1348	14.3	19.5	64.891	F
2	321	80	1041	373	0.863	317	430	4.0	5.0	60.469	F
3	1024	256	514	1024	1.000	996	845	15.7	22.8	80.314	F
4	596	149	1144	629	0.946	585	365	7.6	10.3	65.519	F

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	908	227	339	1159	0.783	970	1215	19.5	4.1	24.917	C
2	263	66	925	437	0.600	276	384	5.0	1.6	24.590	C
3	836	209	451	1068	0.783	910	750	22.8	4.4	33.031	D
4	486	122	1037	695	0.700	517	324	10.3	2.6	24.003	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	760	190	270	1208	0.629	770	958	4.1	1.8	8.716	A
2	220	55	735	543	0.405	224	305	1.6	0.7	11.704	B
3	700	175	362	1129	0.620	710	596	4.4	1.8	9.605	A
4	407	102	814	831	0.490	414	258	2.6	1.0	9.066	A

<h1>Junctions 9</h1>
<h2>ARCADY 9 - Roundabout Module</h2>
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Filename: A507 A6001 B659 RBT PM calibration.j9

Path: M:\Project\5200 to 5299\5279 - Lower Stondon\Junction Calcs April 2017\2017 A507 A6001 B659

Report generation date: 12/04/2017 11:32:21

«2017, PM

- »Junction Network
- »Arms
- »Traffic Demand
- »Origin-Destination Data
- »Vehicle Mix
- »Results

Summary of junction performance

	PM					Network Residual Capacity
	Queue (PCU)	Delay (s)	RFC	LOS		
	2017					
Arm 1	20.0	53.05	0.98	F	-8 % [Arm 2]	
Arm 2	7.9	84.94	0.94	F		
Arm 3	18.9	71.82	0.99	F		
Arm 4	5.0	48.66	0.86	E		

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	A507/ Hitchin Road/ B659 Roundabout
Location	South of Henlow (near Lower Stondon)
Site number	5279
Date	10/04/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	SM/rpwd
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)

5.75			✓	Delay	0.85	36.00	20.00
------	--	--	---	-------	------	-------	-------

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2017, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1,2,3,4	61.93	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-8	Arm 2

Arms

Arms

Arm	Name	Description
1	A507 (e) Arlesey Road	
2	A6001 Hitchin Road	
3	A507 (w)	
4	B659 (n) Hitchin Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.40	8.00	7.4	54.3	39.1	15.0	
2	3.50	5.90	12.6	8.9	39.1	37.0	
3	4.10	7.90	7.5	70.8	39.1	17.0	
4	4.10	7.40	10.3	12.7	39.1	39.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.710	1906
2	0.555	1383
3	0.692	1816
4	0.611	1630

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Direct capacity adjustment (PCU/hr)
1	Direct		-243
2	Direct		-316
3	Direct		-451
4	Direct		-567

Traffic Demand

Demand Set Details

Scenario	Time Period	Traffic profile	Start time	Finish time	Time segment length	Run
----------	-------------	-----------------	------------	-------------	---------------------	-----

ID	name	name	type	(HH:mm)	(HH:mm)	(min)	automatically
D2	2017	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1272	100.000
2		ONE HOUR	✓	322	100.000
3		ONE HOUR	✓	874	100.000
4		ONE HOUR	✓	359	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	9	178	872	213
	2	138	4	21	159
	3	746	18	1	109
	4	80	230	45	4

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	1	2	3
	2	0	0	0	2
	3	2	0	0	3
	4	1	1	0	25

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.98	53.05	20.0	F	1167	1751
2	0.94	84.94	7.9	F	295	443
3	0.99	71.82	18.9	F	802	1203
4	0.86	48.66	5.0	E	329	494

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	958	239	225	1503	0.637	951	726	0.0	1.8	6.563	A
2	242	61	855	593	0.409	240	321	0.0	0.7	10.206	B
3	658	164	393	1094	0.601	652	702	0.0	1.5	8.230	A
4	270	68	683	645	0.419	267	362	0.0	0.7	9.534	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1144	286	269	1472	0.777	1137	868	1.8	3.4	10.759	B
2	289	72	1023	500	0.579	287	384	0.7	1.3	16.838	C
3	786	196	470	1041	0.755	780	839	1.5	3.0	13.825	B
4	323	81	817	563	0.573	320	433	0.7	1.3	14.792	B

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1400	350	323	1434	0.977	1354	1026	3.4	15.0	34.207	D
2	355	89	1218	392	0.905	337	459	1.3	5.7	54.804	F
3	962	241	556	982	0.980	921	999	3.0	13.3	44.132	E
4	395	99	964	473	0.835	384	512	1.3	4.1	36.858	E

17:30 - 17:45

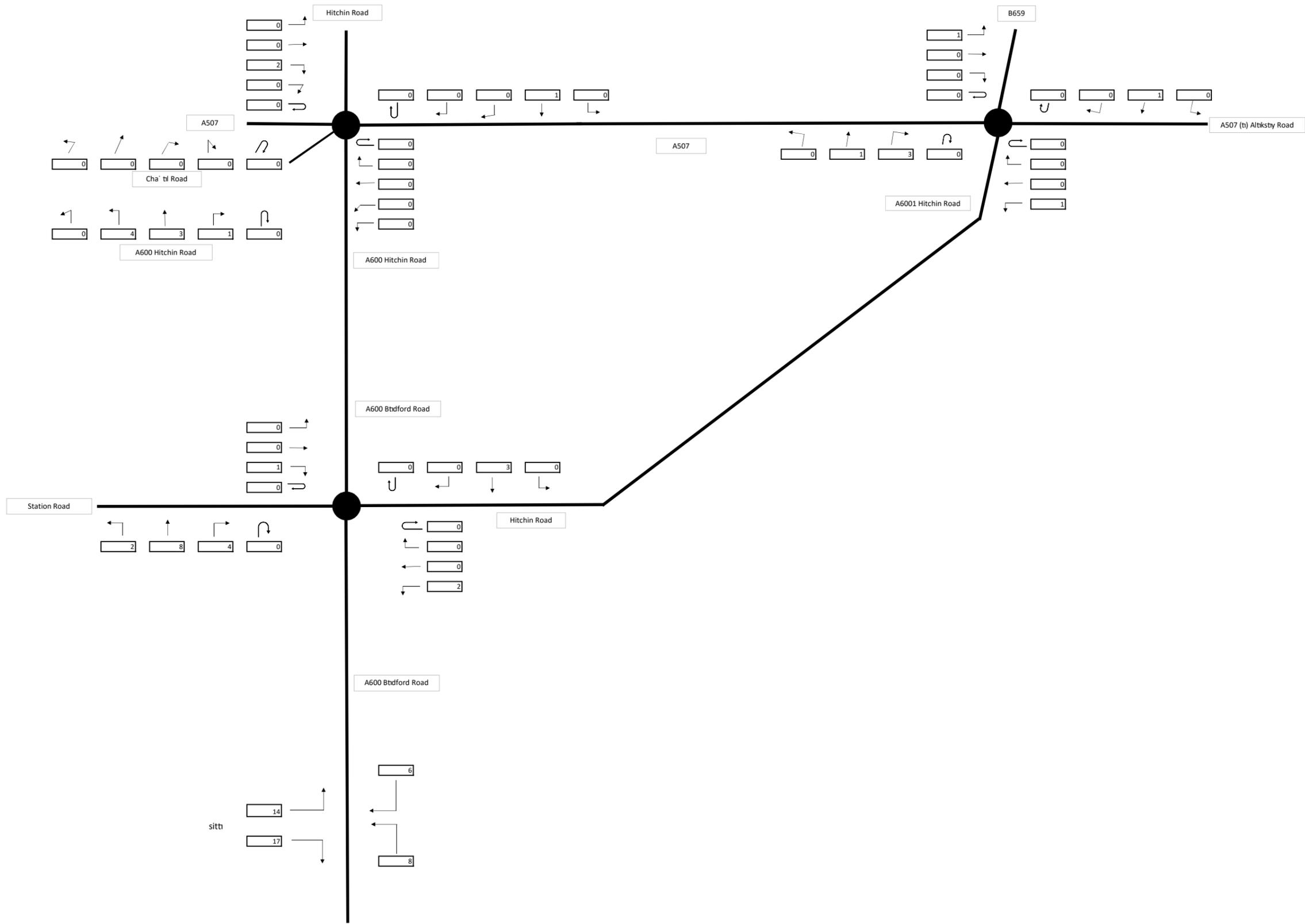
Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1400	350	329	1430	0.980	1381	1048	15.0	20.0	53.051	F
2	355	89	1242	378	0.937	346	468	5.7	7.9	84.937	F
3	962	241	568	973	0.989	940	1019	13.3	18.9	71.822	F
4	395	99	985	461	0.858	392	523	4.1	5.0	48.661	E

17:45 - 18:00

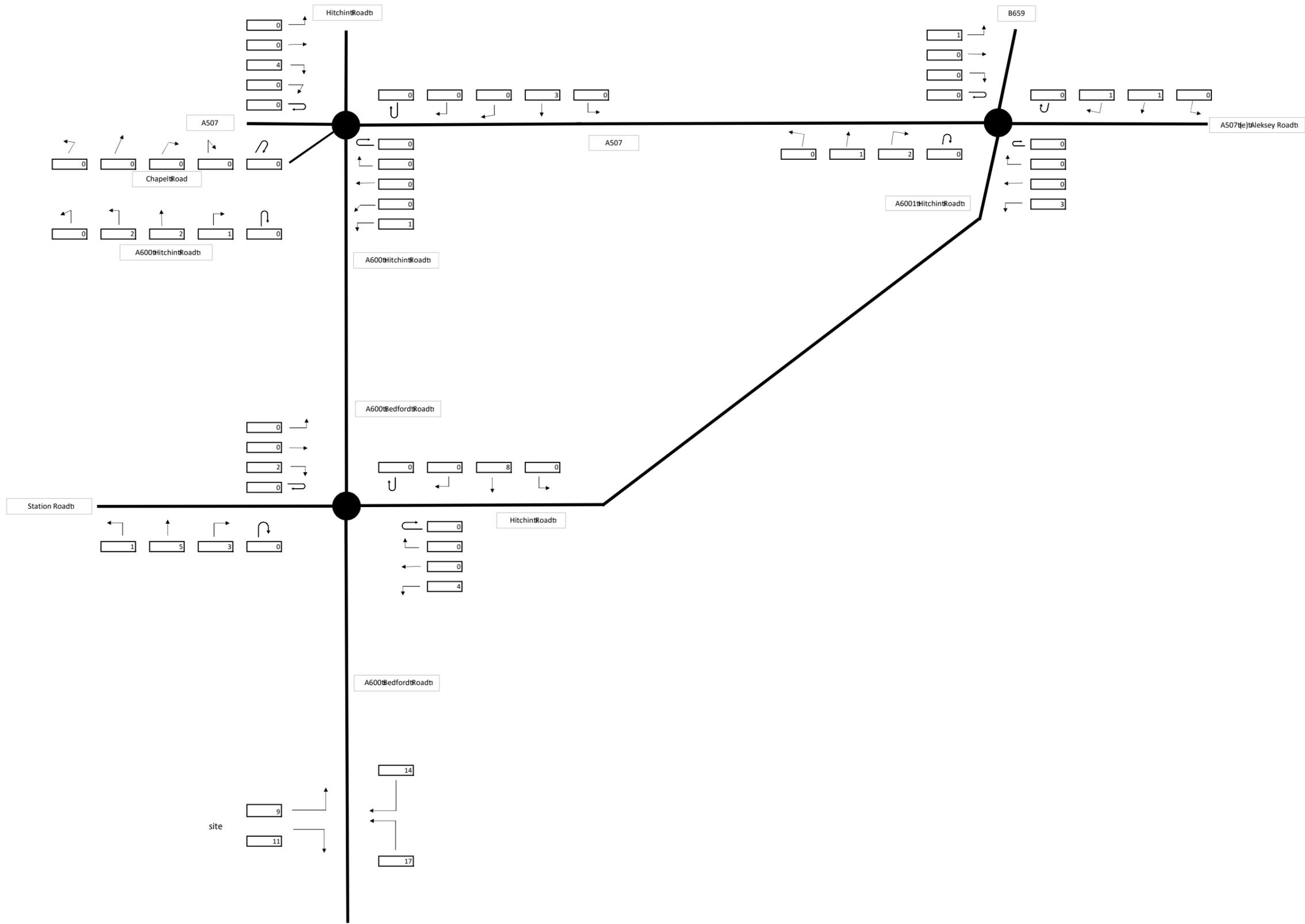
Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1144	286	283	1462	0.782	1208	940	20.0	3.9	17.648	C
2	289	72	1086	465	0.622	314	405	7.9	1.8	27.415	D
3	786	196	508	1014	0.775	846	892	18.9	3.8	27.840	D
4	323	81	887	520	0.620	336	467	5.0	1.7	20.860	C

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	958	239	231	1499	0.639	966	743	3.9	1.8	6.986	A
2	242	61	869	585	0.414	247	328	1.8	0.7	10.856	B
3	658	164	402	1088	0.605	667	713	3.8	1.6	8.940	A
4	270	68	699	635	0.425	274	370	1.7	0.8	10.152	B



A' ' tndix D -AM Phak Ptrioid (07:45-08:45) Potntial Dtvvlo' mtnt Gtntrattid Tri' Assignmtnt



Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.1.4646 []
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Filename: A507 A6001 B659 RBT AM calibration.j9

Path: M:\Project\5200 to 5299\5279 - Lower Stondon\Junction Calcs April 2017\2017 A507 A6001 B659

Report generation date: 13/04/2017 12:16:50

«2017 + Development Generated Trips, AM

- »Junction Network
- »Arms
- »Traffic Demand
- »Origin-Destination Data
- »Vehicle Mix
- »Results

Summary of junction performance

AM					
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
2017 + Development Generated Trips					
Arm 1	19.6	65.18	0.99	F	-8 % [Arm 3]
Arm 2	5.4	63.88	0.87	F	
Arm 3	23.7	83.06	1.00	F	
Arm 4	10.5	66.90	0.95	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	A507/ Hitchin Road/ B659 Roundabout
Location	South of Henlow (near Lower Stondon)
Site number	5279
Date	10/04/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	SM/rpwd
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)

5.75			✓	Delay	0.85	36.00	20.00
------	--	--	---	-------	------	-------	-------

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2017 + Development Generated Trips, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1,2,3,4	71.37	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-8	Arm 3

Arms

Arms

Arm	Name	Description
1	A507 (e) Arlesey Road	
2	A6001 Hitchin Road	
3	A507 (w)	
4	B659 (n) Hitchin Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.40	8.00	7.4	54.3	39.1	15.0	
2	3.50	5.90	12.6	8.9	39.1	37.0	
3	4.10	7.90	7.5	70.8	39.1	17.0	
4	4.10	7.40	10.3	12.7	39.1	39.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.710	1906
2	0.555	1383
3	0.692	1816
4	0.611	1630

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Direct capacity adjustment (PCU/hr)
1	Direct		-506
2	Direct		-433
3	Direct		-437
4	Direct		-301

Traffic Demand

Demand Set Details

	Time Period	Traffic	Start time	Finish time	Time segment	Run

ID	Scenario name	name	profile type	(HH:mm)	(HH:mm)	length (min)	automatically
D2	2017 + Development Generated Trips	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1010	100.000
2		ONE HOUR	✓	296	100.000
3		ONE HOUR	✓	931	100.000
4		ONE HOUR	✓	542	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	21	149	671	169
	2	177	2	9	108
	3	791	77	1	62
	4	268	172	101	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	3	5	4
	2	3	0	0	3
	3	10	3	0	8
	4	2	4	9	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.99	65.18	19.6	F	927	1390
2	0.87	63.88	5.4	F	272	407
3	1.00	83.06	23.7	F	854	1281
4	0.95	66.90	10.5	F	497	746

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	760	190	264	1212	0.627	754	937	0.0	1.7	8.056	A
2	223	56	719	551	0.404	220	298	0.0	0.7	11.068	B
3	701	175	356	1133	0.618	694	583	0.0	1.7	8.818	A
4	408	102	797	842	0.485	404	253	0.0	1.0	8.452	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	908	227	316	1175	0.772	902	1121	1.7	3.3	13.368	B
2	266	67	860	473	0.562	264	357	0.7	1.3	17.463	C
3	837	209	426	1085	0.772	830	698	1.7	3.4	15.039	C
4	487	122	953	746	0.653	484	303	1.0	1.9	14.003	B

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1112	278	374	1134	0.980	1068	1321	3.3	14.3	41.129	E
2	326	81	1019	385	0.847	314	422	1.3	4.2	46.118	E
3	1025	256	506	1029	0.996	974	827	3.4	16.1	49.119	E
4	597	149	1122	643	0.928	573	359	1.9	7.7	43.575	E

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1112	278	381	1129	0.985	1091	1350	14.3	19.6	65.185	F
2	326	81	1041	373	0.874	321	431	4.2	5.4	63.876	F
3	1025	256	518	1021	1.004	995	845	16.1	23.7	83.062	F
4	597	149	1146	629	0.949	585	367	7.7	10.5	66.901	F

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	908	227	341	1158	0.784	970	1221	19.6	4.1	25.146	D
2	266	67	926	437	0.609	281	385	5.4	1.7	25.565	D
3	837	209	456	1064	0.786	914	751	23.7	4.5	35.102	E
4	487	122	1043	691	0.705	519	327	10.5	2.7	24.912	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	760	190	271	1208	0.630	770	961	4.1	1.8	8.733	A
2	223	56	735	543	0.411	227	305	1.7	0.7	11.832	B
3	701	175	365	1127	0.622	711	596	4.5	1.8	9.692	A
4	408	102	817	829	0.492	415	260	2.7	1.0	9.129	A

<h1>Junctions 9</h1>
<h2>ARCADY 9 - Roundabout Module</h2>
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Filename: A507 A6001 B659 RBT PM calibration.j9

Path: M:\Project\5200 to 5299\5279 - Lower Stondon\Junction Calcs April 2017\2017 A507 A6001 B659

Report generation date: 13/04/2017 12:16:02

«2017 Development Trip Generation, PM

- »Junction Network
- »Arms
- »Traffic Demand
- »Origin-Destination Data
- »Vehicle Mix
- »Results

Summary of junction performance

PM					
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
2017 Development Trip Generation					
Arm 1	20.9	55.03	0.98	F	-9 % [Arm 2]
Arm 2	8.4	88.75	0.95	F	
Arm 3	19.4	73.65	0.99	F	
Arm 4	5.2	50.15	0.86	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	A507/ Hitchin Road/ B659 Roundabout
Location	South of Henlow (near Lower Stondon)
Site number	5279
Date	10/04/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	SM/rpwd
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)

5.75			✓	Delay	0.85	36.00	20.00
------	--	--	---	-------	------	-------	-------

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2017 Development Trip Generation, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	1,2,3,4	64.02	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-9	Arm 2

Arms

Arms

Arm	Name	Description
1	A507 (e) Arlesey Road	
2	A6001 Hitchin Road	
3	A507 (w)	
4	B659 (n) Hitchin Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.40	8.00	7.4	54.3	39.1	15.0	
2	3.50	5.90	12.6	8.9	39.1	37.0	
3	4.10	7.90	7.5	70.8	39.1	17.0	
4	4.10	7.40	10.3	12.7	39.1	39.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.710	1906
2	0.555	1383
3	0.692	1816
4	0.611	1630

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Direct capacity adjustment (PCU/hr)
1	Direct		-243
2	Direct		-316
3	Direct		-451
4	Direct		-567

Traffic Demand

Demand Set Details

	Time Period	Traffic	Start time	Finish time	Time segment	Run

ID	Scenario name	name	profile type	(HH:mm)	(HH:mm)	length (min)	automatically
D3	2017 Development Trip Generation	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1275	100.000
2		ONE HOUR	✓	325	100.000
3		ONE HOUR	✓	875	100.000
4		ONE HOUR	✓	361	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	9	181	872	213
	2	140	4	21	160
	3	746	18	1	110
	4	80	231	46	4

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	1	2	3
	2	0	0	0	2
	3	2	0	0	3
	4	1	1	0	25

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.98	55.03	20.9	F	1170	1755
2	0.95	88.75	8.4	F	298	447
3	0.99	73.65	19.4	F	803	1204
4	0.86	50.15	5.2	F	331	497

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	960	240	226	1502	0.639	953	727	0.0	1.8	6.601	A
2	245	61	856	593	0.413	242	324	0.0	0.7	10.279	B
3	659	165	395	1093	0.603	653	702	0.0	1.5	8.272	A
4	272	68	685	644	0.422	269	363	0.0	0.7	9.593	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1146	287	271	1471	0.779	1140	870	1.8	3.4	10.876	B
2	292	73	1023	500	0.585	290	388	0.7	1.4	17.073	C
3	787	197	473	1039	0.757	781	840	1.5	3.0	13.956	B
4	325	81	819	562	0.577	322	435	0.7	1.3	14.955	B

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1404	351	325	1433	0.980	1355	1027	3.4	15.5	35.020	E
2	358	89	1217	392	0.913	340	463	1.4	5.9	56.413	F
3	963	241	558	980	0.983	921	999	3.0	13.6	44.876	E
4	397	99	965	473	0.840	386	514	1.3	4.2	37.667	E

17:30 - 17:45

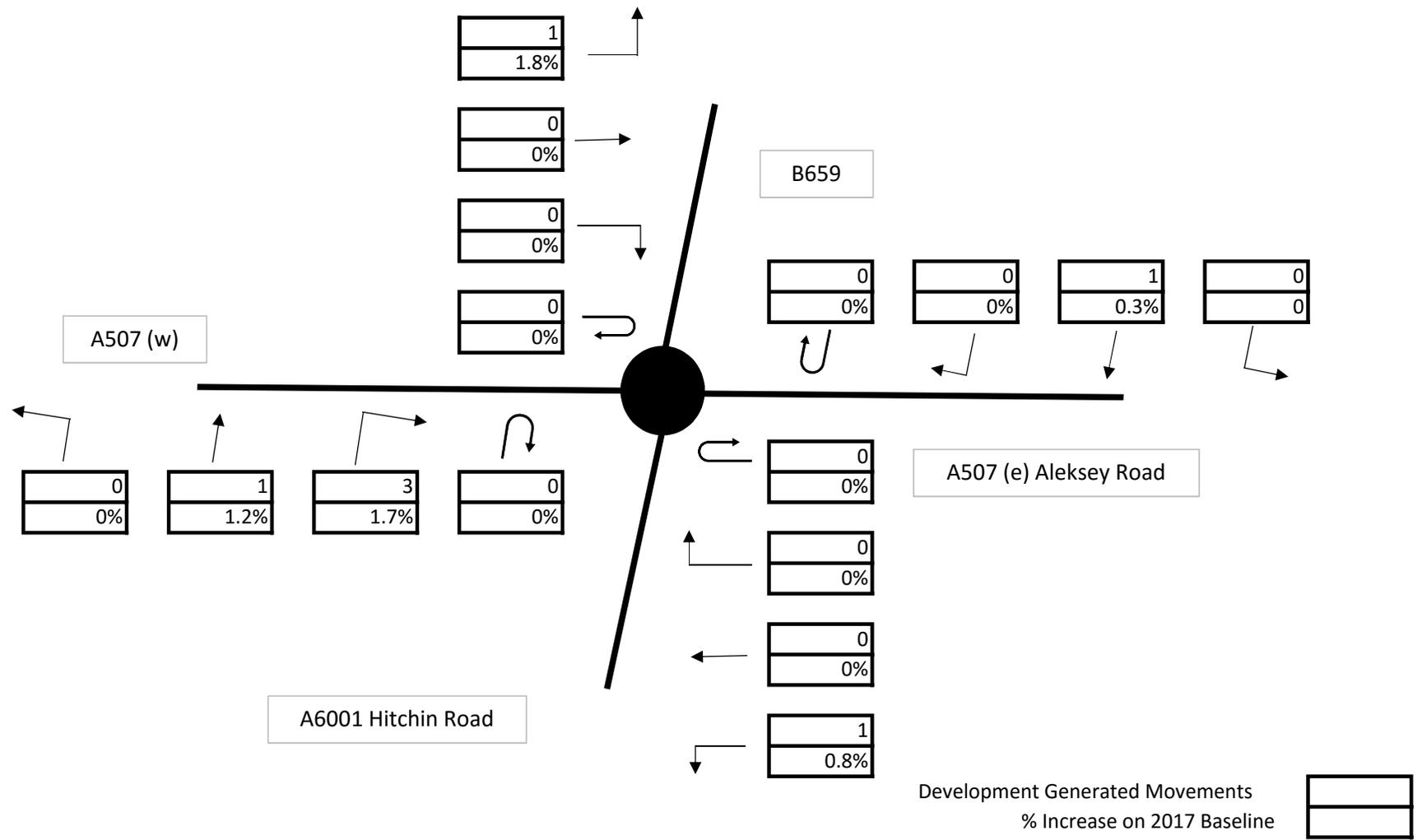
Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1404	351	331	1428	0.983	1382	1048	15.5	20.9	55.032	F
2	358	89	1242	379	0.945	348	472	5.9	8.4	88.752	F
3	963	241	571	971	0.992	940	1019	13.6	19.4	73.650	F
4	397	99	986	460	0.864	394	525	4.2	5.2	50.147	F

17:45 - 18:00

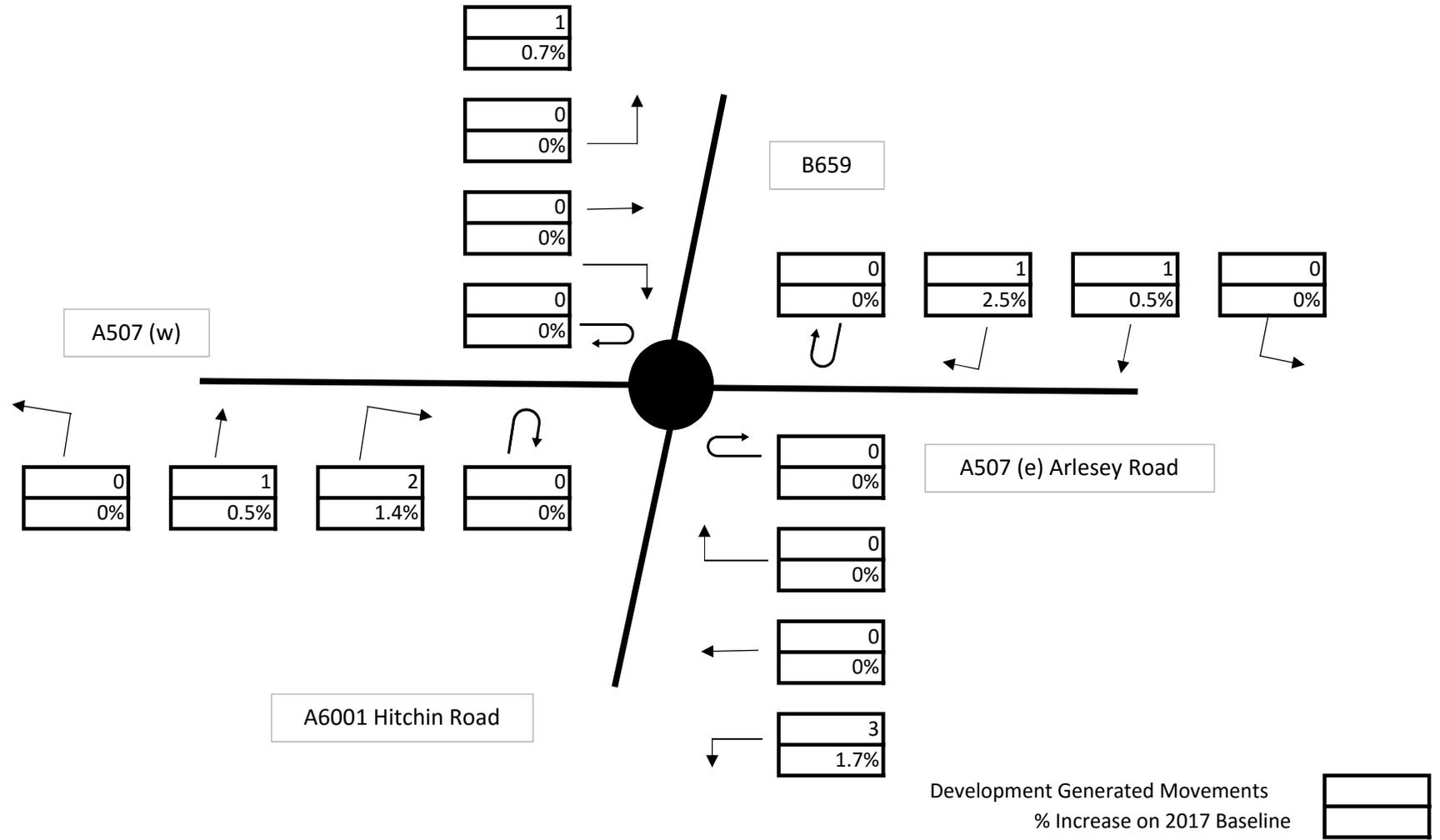
Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	1146	287	285	1461	0.785	1214	944	20.9	4.0	18.442	C
2	292	73	1089	463	0.631	318	410	8.4	1.8	28.952	D
3	787	197	513	1011	0.778	849	895	19.4	3.9	29.158	D
4	325	81	892	518	0.627	338	470	5.2	1.8	21.496	C

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1	960	240	232	1498	0.641	968	745	4.0	1.9	7.038	A
2	245	61	870	585	0.418	249	331	1.8	0.7	10.962	B
3	659	165	405	1086	0.607	668	714	3.9	1.6	9.006	A
4	272	68	701	634	0.428	276	371	1.8	0.8	10.237	B



Appendix F - AM Peak Period (07:45-08:45) Development Generated Trips



PM Peak Period (17:00-18:00) Development Generated Trips

APPENDIX E

Central Bedfordshire Council Site Assessment Forms Henlow

Site Assessment Framework for HOUSING⁷⁸

Site details	
Reference Number	NLP469
Site Name	RAF Henlow
Site Address	RAF Henlow
Settlement	Henlow
Size	Submitted Developable Area: 220ha Submitted Whole Site Area: 220 ha Measured GIS Area: 220 ha
Proposed Use	Mixed use: Residential and Business Use
Any other information	

STAGE 1 : SUITABILITY AND AVAILABILITY (EXCLUSIONARY STAGE)

This section will exclude any sites which do not pass the exclusionary suitability criteria and they will not be assessed further.

STAGE 1A ASSESSMENT

This stage of the assessment rules out sites that are too small or conflict with national policy designations.

Provisional Site Capacity

1	<p>Is the site likely to accommodate less than 10 dwellings? Work out the number of new homes from site size using density of 30dph and exclude up to 40 % depending on site size of land for infrastructure and services, take into account topography or significant areas of undevelopable land. Site Size Gross to net ratio standards</p> <ul style="list-style-type: none"> • Up to 0.4 hectare 100% • 0.4 to 2 hectares 80% • 2 hectares or above 60% <p><i>Note: for this calculation use the submitted Developable Area, or the area measured in GIS if this is smaller.</i></p>	No	Number of proposed dwellings as per proforma: 1800 dwellings
			Number of proposed dwellings as per CBC methodology: 700 dwellings Consisting of 220 additional dwellings within the RAF base on land within the control of the site promoters and 480 dwellings within the Airfield on land to the west and south of the Listed Hangers. Excluding land from within the Safeguarding Area of the MBDA site and land to the north of the site which is considered to isolated for residential development that is not of a scale that would be self contained.

Flood Risk (All sites which reach Stage 2 will be subject to the Sequential Test)

2	Is more than 50% of the site located in Flood Zone 2 or 3?	No	Less than 50% of site is located within Flood Zone 2 and 3.
3	Is more than 50% of the site at risk from surface water flooding?	No	Less than 50% of the site is at risk from surface water flooding.

Nationally significant designations (All sites which reach Stage 2 be subject to detailed assessment)

4	Is more than 50% of the site covered by nationally significant designations? These are: Sites of Special	No	The site is not covered by nationally significant designations.
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⁷⁸ Employment sites and Gypsy and Traveller sites will be assessed using separate bespoke site assessment criteria.

	Scientific Interest, National Nature Reserves, Scheduled Monuments, Registered Parks and Gardens.		
5	Is more than 50% of the site located within the Area of Outstanding Natural Beauty?	No	No part of site covered by AONB.
Does the site continue to next stage?			Yes

STAGE 1B ASSESSMENT

This stage of the assessment rules out sites that are not well related to existing settlements but are of an insufficient size to be self contained. It also rules out sites which would cause coalescence of existing towns or villages. For the purposes of this assessment, a self-contained site is defined as a site which will provide 1,500 homes or more⁷⁹.

Relationship to Settlement

6	For sites that are not of a sufficient scale to be self-contained, is the site a logical extension to the settlement or are there any major physical constraints (for example A roads, rivers or railways) that separate it from the main settlement?	A	It is considered that development within Henlow Camp and land to the south and west of the Listed Hangers would be well related to Lower Stondon. Land to the north of the site adjoining the A507 but beyond the MBDA safeguarding area would appear isolated from settlements and development in this area would not be of a scale that would self-contained. Therefore a portion of development within the site would be acceptable.
7	Does the site cause coalescence between an existing village or town and another existing village or town? If yes, then grade as Amber if the site would be able to provide appropriate buffers or green wedges to mitigate this, or Red if it would not be possible for appropriate buffers to be provided leaving a reasonable developable area based on the individual context of the site.	G	No coalescence issues.
Does the site continue to next stage?			Yes

STAGE 1C ASSESSMENT

This stage of the assessment rules out sites that are not able to meet their critical infrastructure needs⁸⁰.

Critical Infrastructure

8	Can the site meet the critical infrastructure requirements that will enable delivery ⁸¹ ?	G	No critical infrastructure requirements were identified in the form.
Does the site continue to next stage?			Yes

⁷⁹ The figure of 1,500 homes has been taken from the Government Publication 'Locally-Led Garden Villages, Towns and Cities'. This defines the eligibility criteria for Garden Villages as standalone settlements of between 1,500 and 10,000 homes. (see https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/508205/Locally-led_garden_villages_towns_and_cities.pdf)

⁸⁰ Critical infrastructure is that which has been identified as infrastructure that must happen to enable physical development. These infrastructure items are often known as 'blockers' or 'showstoppers', and are most common in relation to transport and utilities infrastructure. Failure to provide these pieces of infrastructure could result in significant delays in the delivery of development.

⁸¹ This is an assessment based on the information known at this stage, a full assessment of infrastructure requirements will be undertaken before any sites are allocated.

STAGE 1D ASSESSMENT

This stage of the assessment rules out sites that are not available. A site is considered available for development where there are no legal or ownership problems and the landowner has expressed an intention to develop the site.

Availability

9	What is the existing use of the site? Would the existing use limit the development potential?	G	The existing use of the site is a military base and airfield.
10	Is the land controlled by a developer or land owner who has expressed an intention to develop the site?	A	The site is largely within the sole control of the site promoter however portions of the site are not and as such those areas are not considered to be available for development, at this date.
11	Are there any legal or ownership problems that could delay or prevent development? If Yes, then can these be issues be realistically overcome?	A	If is considered that the ownership of the building within the airbase will need to be resolved but it is considered that this could be realistically overcome.
12	Does the site already have planning permission for the proposed use? If yes, then score as Red because it's not eligible for allocation.	G	No.
Does the site continue to next stage?			Yes

STAGE 1E ASSESSMENT

This section records the findings of the Strategic Green Belt Review and also provides a preliminary screening of sites to determine whether they may be capable of demonstrating Exceptional Circumstances. Any site in the Green Belt that is determined as suitable based on the high level SHLAA assessment would still have to demonstrate Exceptional Circumstances to considered for allocation in the Plan.

Greenbelt

13	Is the site located within the Green Belt?	No	
14	If answer to question 13 is yes, then does the site lie within one of the parcels which have been identified in the Central Bedfordshire and Luton Green Belt Study as making only a relatively weak, weak, or no contribution? If yes, site progresses through to Stage 2.	N/A	
15a	Does the site have all of the following merits that may outweigh the harm to the Green Belt and which may contribute to identification of exceptional circumstances? <ul style="list-style-type: none"> • Adjoining settlement has at least 3 of the following key local services - convenience shop, lower school, middle school, upper school, village hall, GP surgery, post office, library (use settlement audit) • Site makes a strong contribution to housing need (100 plus homes) within the Luton HMA • Site is in or directly adjacent to a settlement that has a mainline rail station or direct access (junction) to the strategic road network (A road or motorway) Sites in Green Belt other than those covered by 14 and 15b that cannot meet these criteria, will not	N/A	

	progress any further in this assessment of suitability.*		
15b	Sites which have support from the local community as demonstrated through an allocation in an adopted or draft Neighbourhood Plan (that has been subject to Regulation 14 consultation) that do not meet the criteria in question 15a will automatically progress through this stage to be considered further at Stage 2. ⁸²	N/A	
Does the site continue to next stage?			Yes

STAGE 2 : SUITABILITY (DETAILED ASSESSMENT)

STAGE 2 ASSESSMENT

This stage further assesses the site's suitability using detailed desktop assessment. A red rating for any question does not mean that the site will be automatically excluded at this stage as the ratings across Stage 2A will be looked at as a whole using planning balance.

Previously Developed Land

16	Is the site Previously Developed Land in accordance with the NPPF definition? <ul style="list-style-type: none"> 76% - 100% (G) 26 - 75% (A) 25% - 0% (Greenfield) (R) 	G	Large portions of the site is considered to form previously developed land.
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Community

17	Neighbourhood Planning (only applicable in designated areas) Is the site identified as a housing allocation in an emerging Neighbourhood Plan?	No	Although Henlow is a parish which has been designated for a Neighbourhood Plan, there are no draft allocations at this stage.
18	Community Consultation Has any community consultation taken place? If yes, provide brief details on the form this consultation took and any overall community response.	No	No consultation has taken place.
19	Sustainability of Settlement Would this proposal impact on the sustainability of the settlement through the loss of services and facilities (for example, employment, retail, public house etc)	Yes	Development of the site would result in the loss of local employment. Development of this site would be required to provide opportunities for local employment.

Cumulative Impact

20	Considering housing completions over the past 10 years, what has been the level of housing growth in the parish? <ul style="list-style-type: none"> Less than 5% growth (G) 5% to 20% growth (A) More than 20% growth (R) <i>This is calculated by working out the total number of completions over the last ten years as a percentage of the dwellings in April 2006 (as calculated using census and completions data).</i>	A	Number of houses in 2006: 1,592 Number of houses in 2016: 1,708 Percentage growth: 7.29%
21	What level of housing growth would there be if all the outstanding permissions (as of April 2016) were to be completed? <ul style="list-style-type: none"> Less than 5% growth (G) 5% to 20% growth (A) 	G	Outstanding completions: 10 Number of houses in 2016: 1708 Percentage growth: 0.59%

⁸² Draft Neighbourhood Plan allocations in Green Belt that are proposed after this site assessment phase has concluded, may still be considered for allocation.

	<ul style="list-style-type: none"> More than 20% growth (R) <p><i>This is calculated by working out the total number of outstanding permissions as of April 1st 2016 as percentage of the total number of dwellings in April 2016 (as calculated using census and completions data).</i></p>		
Physical Constraints			
22	<p>Are there any physical constraints or permanent features that affect the site's developability? For example pylons, gas works, sewage treatment works, topography or wind turbines.</p>	A	The MBDA which neighbours the site stores hazardous substances which would significantly affect developability of a large area of the site. In addition development would be required to ensure that it would not result in the total number of vehicular movements upon Bedford Road to equal or exceed 10,000 movements in 24 hours, to ensure development would not negatively affect the ability of the MBDA to continue activities.
Relationship to Settlement			
23	<p>Would development of the site be complementary to the existing settlement pattern, and would it have an adverse impact on any historic, unique or distinctive characteristics of the settlement's built or natural form?</p>	A	Development within the RAF Base to the south of Hitchin Road would not provide significant opportunities for interconnectivity between Lower Stondon and the development.
Agricultural Land Quality			
24	<p>Would the development impact on high quality agricultural land?</p> <ul style="list-style-type: none"> 50% or more in non-agricultural land (G) 50% or more in Grade 3b, 4 or 5 (A) 50% or more in Grade 1, 2 or 3a (R) 	G	50% or more in non-agricultural land.

STAGE 2 ASSESSMENT

This stage further assesses the site's suitability using comments from technical specialists. A red rating for any question does not mean that the site will be automatically excluded at this stage as the ratings across Stage 2B will be looked at as a whole using planning balance.

Transport and Access to Services

25	<p>Facilities and services</p> <p>Question 26 considers the suitability and sustainability of the site for housing. It links to the Council's Settlement Hierarchy Audit.</p> <p>Issues relating to capacity are assessed separately</p>		
25a	<p>Does the settlement have a Primary/Lower school?</p> <ul style="list-style-type: none"> Yes, in the settlement (G) Yes, proposed as part of the development (G) No, but an adjoining settlement does (A) Not in the settlement or an adjoining settlement (R) 	G	Stondon Lower School.
25b	<p>Does the settlement have a Middle school (if applicable)?</p> <ul style="list-style-type: none"> Yes, in the settlement (G) Yes, proposed as part of the development (G) No, but an adjoining settlement does (A) Other catchment school available (A) 	A	Robert Bloomfield Academy, Shefford

25c	Does the settlement have a Secondary/ Upper school? <ul style="list-style-type: none"> • Yes, in the settlement (G) • Yes, proposed as part of the development (G) • No, but an adjoining settlement does (A) • Other catchment school available (A) 	A	Samuel Whitbread Academy, Shefford
25d	Does the settlement have a GPs surgery or medical centre? <ul style="list-style-type: none"> • Yes, in the settlement (G) • Yes, proposed as part of the development (G) • No, but an adjoining settlement does (A) • Not in the settlement or an adjoining settlement (R) 	G	The Hawthorn Surgery, Lower Stondon.
26	What retail provision does the settlement offer? <ul style="list-style-type: none"> • Town Centre/ Supermarket (G) • Convenience Store / Post Office / Newsagent (A) • None (R) 	A	Convenience store
27	Distance to bus stops with a frequent service (at least hourly at peak times): <ul style="list-style-type: none"> • Less than 400m (G) • 400m-800m (A) • Over 800m (R) • OR submission form stated that improved public transport facilities could be provided as part of the development (G) 	A	Service 89 Hitchin.
28	Distance to nearest train station: <ul style="list-style-type: none"> • Less than 800m (G) • 800m-1200m (A) • Over 1200m (R) 	R	Over 1200m to Arlesey station. Opportunity to provide cycle link to Arlesey Train Station.
29	Is the site accessible from the existing road network?	G	Bedford Road, Hitchin Road and A507.
School Capacity			
30	Do the local schools have capacity at all tiers?	A	Stondon lower is on a constrained site and already feeling pressure from development in catchment. Derwent lower may be able to accommodate some expansion. Middle and upper school places are very tight in this area.
31	If not, has a commitment been made to address this?	A	Commitment to expand existing primary schools and provision of new primary school if necessary. No commitment made to contribute towards the expansion of existing or on site provision of middle, upper, secondary or higher education facilities. Provision of schools or financial contributions for the expansion of existing schools, will be required as necessary to make development acceptable, the detail of which is subject to the scale of the

			development proposed on the site.
Water Utilities (Gas, Electricity and Broadband Infrastructure will be assessed at a later stage)			
32	Is there the capacity to provide all required infrastructure for waste water and potable water?	A	Water utilities companies have a statutory duty to supply water and waste water infrastructure to new development sites and a lack of available capacity does not prevent future development. Any infrastructure upgrades required will depend on the quantum and location of growth falling within each catchment area. Whilst the Stage 1 Water Cycle Study (April 2017) identifies the current capacity of existing water infrastructure, a Stage 2 study will be prepared to test the cumulative effect of sites that have been shortlisted for allocation in the Local Plan and identify the nature and timing of any upgrades required.
Drainage and Flooding (All sites subject to Sequential Test)			
33	What is the conclusion of the sequential approach to site allocations, in regards to flood risk? <ul style="list-style-type: none"> No assessment required (G) Consider Further Assessment (A) Further Assessment Required (R) 	G	Site is at limited risk of surface water flooding, assessment is unlikely to be required
Environmental Health			
34	Contamination Are there any contamination constraints on site and will there be any remediation required?	A	Potential Land Contamination within the site including former railway lines, storage of hazardous substances, imported materials for landscaping of golf course and other sources associated with historic use of the land. Contamination will need to be dealt with appropriately.
35	Adjoining uses Would any adjoining uses have the potential to cause conflict with the proposed use? (for example; noise and smell)	A	Noise – the relationship between existing and proposed, the impact on highway noise etc will need assessment. Potential sources of Air Pollution including sewage works / industrial uses neighbouring the site. Impacts from proposed development on neighbouring uses within the site and neighbouring the site would also need to be assessed.
Environmental Constraints			
36	Landscape character What would the impacts of development be on the landscape character or setting of the area or any designated landscapes? Would there be any direct or indirect harm to the Area of Outstanding Natural Beauty or the Nature Improvement Area?	G	Landscape Officer has issued the following comment: Need to ensure any future development is set within significant landscape framework to contain growth.

			<p>Need to integrate any development within a quality scale landscape setting to contain and separate spatially from growth east of Arlesey, any future growth at Stotfold and Lower Stondon to avoid the image of coalescence. Need to enhance landscape character and habitat values in around the site and linked to green infrastructure, SUDs, sustainable landscape design. Potential to include significant woodland planting to provide quality setting and to mitigate image and effects of development e.g. increasing canopy cover to screen, shade and contribute to surface water management; habitat creation including wet woodland planting linked to SuDS; treed highway avenues and parkland trees to enhance POS.</p>
37	<p>Heritage/ Archaeology What would the impacts of development be on any heritage assets and their setting? Are there any opportunities for enhancement of these assets?</p>	A	<p>The Council's Archaeologist has issued the following comment:</p> <p>The facility lies within a multi-period archaeological landscape and while the military structures will have undoubtedly truncated earlier remains in some places, there are other areas where archaeological deposits could conceivably survive fairly intact (for example the air field). That being the case we would expect a programme of non-intrusive survey, followed by targeted trial trenching (as appropriate) to form part of any planning submission (this would be in line with para 128 of the NPPF). This would then lead to an appropriate mitigation strategy being devised (in line with para 141 of the NPPF) if consent was granted. Should the site be allocated, a contingency for archaeological works must be included in any proposal to prevent issues with viability and CBC should note the duties of LPAs towards the historic environment when creating Local Plans (see para 126 of the NPPF) when considering this site.</p>

The Council's Conservation Officer has issued the following comment:

There are 6 separately listed (all Grade II) buildings. RAF Henlow was established in 1917 as the Eastern Command Repair Depot, with link to Midland Railway.

Buildings 186, 187, 188 & 189 form an in-line group. Built 1918 by the War Office Directorate of Fortifications & Works. Brick & steel walls with 'Belfast' softwood roof trusses. Listed 1 December 2005.

Building 190 continues the group eastwards of the 4 hangers located to the west. Built 1918 by WODFW. Brick & steel walls with Dorman Long steel trusses. Listed 1 December 2005.

Building 370 with 330 was built 1933 by the Air Ministry Directorate of Works & Buildings. Design influenced by the Royal Fine Arts Commission on military architecture. Red brick, Portland stone, slate roofs. Listed 1 December 2005.

The innovative hanger and wide span shed buildings are of particular special historic interest and importance in their role in sustaining the 1914-18 war effort recognised as a part of the national review of 20th century wartime buildings.

Finding appropriate uses for these large buildings will certainly be a challenge. Also how to integrate them, in a suitably sympathetic and dignified way, within the context of a new large scale housing development, will require careful handling of the buildings themselves as a group and their setting and a certain separation space from surroundings to work successfully.

There are non-designated heritage

			<p>assets on site which form an integral part of the site's history and context and these include the airfield itself, buildings, and a number of pillboxes on the perimeter.</p> <p>Where similar re-development of former MOD sites has taken place a programme of recording of all structures in their original condition has taken place prior to or just after the closure of the facilities. In some cases this has been undertaken by the Research Department at Historic England (see RAF Stanbridge). These records have then formed a vital part of the re-development proposals; it is therefore recommended that a similar approach is adopted for RAF Henlow and this approach would be in line with the requirements of para 128 of the NPPF. I would also expect consultation with Historic England to have taken place prior to a planning submission and any application would need to be compliant with paras 132-135 of the NPPF.</p>
38	<p>Ecological Assets What would the impacts of development be on any biological, geological or ecological assets and are there any opportunities for their enhancement?</p>	A	<p>Northern area of the site forms an extensive area of semi-natural habitat with associated interest for Species of Principal Importance. Depending on level of development within that area it may be hard to demonstrate net gains for biodiversity.</p>
39	<p>Open space/leisure and GI assets Are there any potential conflicts with open space, leisure designations or Rights of Way? Is there capacity to provide the required levels of open space and green infrastructure?</p>	G/A	<p>Scope for net GI enhancement, no specific aspirations identified in parish GI plans.</p> <p>No loss of Leisure Strategy sites. Near to Derwent Lower School, BMX track off Station Road (Stondon), Oldfield Farm Play Area and Amenity Space. Further afield: Samuel Whitbread Academy, Henlow Academy, Ransford Academy, All Saints Lower School.</p> <p>The development would require stand alone recreational open space and sporting facilities.</p>

40	What would the impacts of development be on safeguarded minerals and waste sites, including mineral safeguarding sites?	G	No issues
Planning History			
41	What is the sites planning history? (For example planning applications and submissions to previous Allocations Plans)		None relevant.
Does the site continue to next stage?			Yes

STAGE 2 ASSESSMENT CONCLUSION

Is the site suitable for the proposed development?

This site consists of the Military Airfield and Base known as RAF Henlow, neighbouring Lower Stondon. The village of Lower Stondon lies to the south and west of the site and the village of Haynes lies to the north, separated from the site by the A507.

RAF Henlow is a Military facility which is considered to be of national importance in terms of military aviation heritage due to its use during both of the World Wars, the inter-war years and post-war. The site has been announced for disposal by the Ministry of Defense as part of the Better Defense Estate Strategy. The Growth Location falls within the Landscape Character Area known as the Upper Ivel Clay Valley which is an open arable landscape with more intimate, enclosed pastures along the immediate river corridors. The site is considered to largely form previously developed land, whereby the NPPF promotes the reuse of such land.

Development within the site has the potential to affect the setting of a number of heritage assets including:

- 190 Hitchin Road, Henlow, Grade II Listed Building;
- Old Ramerick Manor, Grade II* Listed Building;
- Building 370 with 330 (Officer's Mess), RAF Henlow, Grade II Listed Building;
- Buildings 186,187, 188 and 189 (Aircraft Hangers), RAF Henlow, Grade II Listed Buildings; and
- Building 190 (Coupled General Service Shed), RAF Henlow, Grade II Listed Building.

In addition to the above it is considered that RAF Henlow is and contains non designated heritage assets due to the part it played in the World Wars and interwar years.

However it is considered that subject to the retention and appropriate re-use of heritage assets within the site as well as appropriate master planning that the impact of development upon heritage assets could be outweighed by the benefits of development at this site, in the context of paragraphs 132-134 of the NPPF.

The site also has the potential to contain multi-period archaeological remains which would not form an overriding constraint to development but will require investigation, recording and where necessary preservation in situ.

Any harm to designated or non designated heritage assets will need to be considered in accordance with national and local policy.

This site is located in close proximity to Hazardous Substances at the MBDA site which have the potential to cause major accidents. The presence of this Hazardous Substances would affect the developable area within this site and the scale of development in the context of additional vehicular movements on Bedford Road. Regard is to be had to the objectives of preventing major accidents and limiting the consequences of such accidents by pursuing those objectives through the controls described in Article 12 of the Council Directive 96/82/EC as well as the need in the long term, to maintain appropriate distances between such establishments and residential areas, buildings and areas of public use, major transport routs as far as possible, recreational areas and areas of particular natural sensitivity or interest.

Due to the above constraints, it is considered that the location and scale of development within this site is heavily constrained, whereby the scale of development will need to be carefully considered to ensure that the total movements on Bedford Road would not exceed 10,000 movements per 24 hours. If movements would exceed 10,000 per 24 hours then this would affect the activities of an existing business use, contrary to the NPPF. Traffic movements from residential development cannot be controlled by Planning Conditions unlike commercial deliveries and vehicular movements associated with commercial uses, which may be considered a more appropriate use for this site.

For the reasons outlined above it is considered that a portion of the site could only be considered appropriate for residential development, limiting built development area to the south and west of the listed hangers and general service shed and to the areas available for development within the RAF Base to the south of Hitchin Road. Any development to the north of the Airfield, beyond the exclusion zones associated with the MBDA site would be isolated and would be less than 1500 homes, whereby it is not considered that development of that scale would be self-contained. This area of land could be considered for Commercial uses.

Development within this location would benefit from connections towards Hitchin, the A507 and the A1 beyond, as well as relatively close proximity to Arlesey Train Station.

The A507 and the A1 are currently subject to a significant volume of traffic and are close to capacity at peak times. Development within this area could increase traffic on the A507 and the A1 as well as the existing road network, including routes towards Hitchin. A comprehensive scheme for highway improvements will be required to demonstrate that such impacts would be mitigated.

Development in this site would be required to provide public transport infrastructure within the development and provision of an efficient public transport route through the site that links to Arlesey Railway Station and Hitchin serving both the new settlement and improvements to the service to existing neighbouring settlements.

Development in this site would be required to improve connections (serving both the development and existing settlements) including cycleway connections and footpaths (Rights of Way), connecting to Arlesey Train Station.

This site is located near to the following sources of pollution:

- vehicular noise on adjoining roads;
- sewage works; and
- neighbouring uses.

There is potential for land contamination within the site due to historic uses within the landscape.

Potential future development within this site will require appropriate mitigation in accordance with national and local planning policy.

In the context of biodiversity, the northern area of the site forms an extensive area of semi-natural habitat with associated interest for species of importance. Development would be required to protect endangered species, provide a net gain for biodiversity.

Any future development within this site must be in conformity with national and local policy.

Development of this Growth Location provides an opportunity to provide Blue/Green Infrastructure to benefit future occupiers and existing communities.

For the reasons outlined above it is considered that this site is worthy of further assessment for development.

STAGE 3 : ACHIEVABILITY

This section assesses whether the site is Achievable in line with NPPG Guidance:

A site is considered achievable for development where there is a reasonable prospect that the particular type of development will be developed on the site at a particular point in time. This is essentially a judgement about the economic viability of the site, and the capacity of the developer to complete and let or sell the development over a certain period.