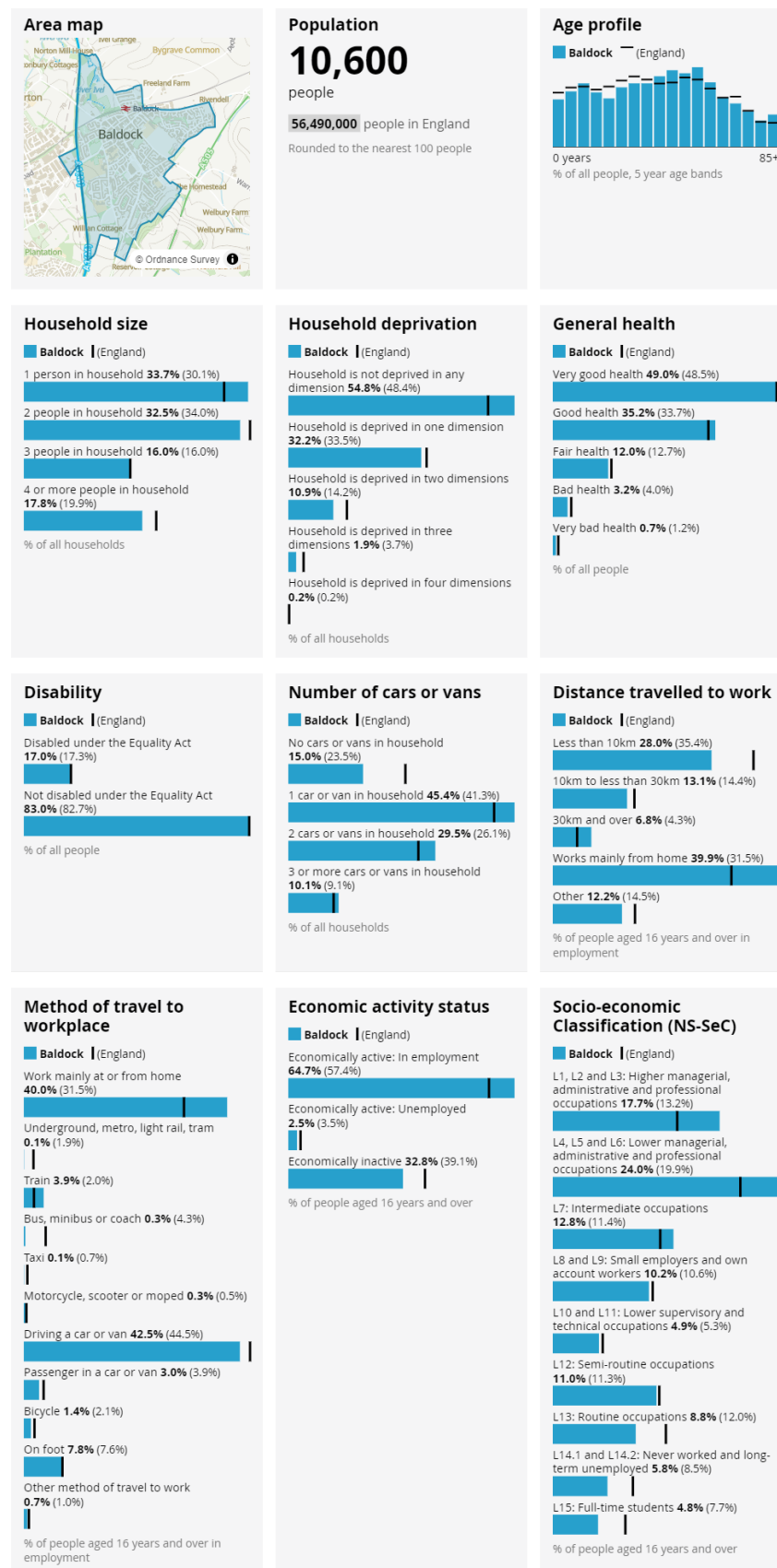


Figure 4-1: Baldock Census 2021 profile



Source: Office for National Statistics - Census 2021

Strava Data

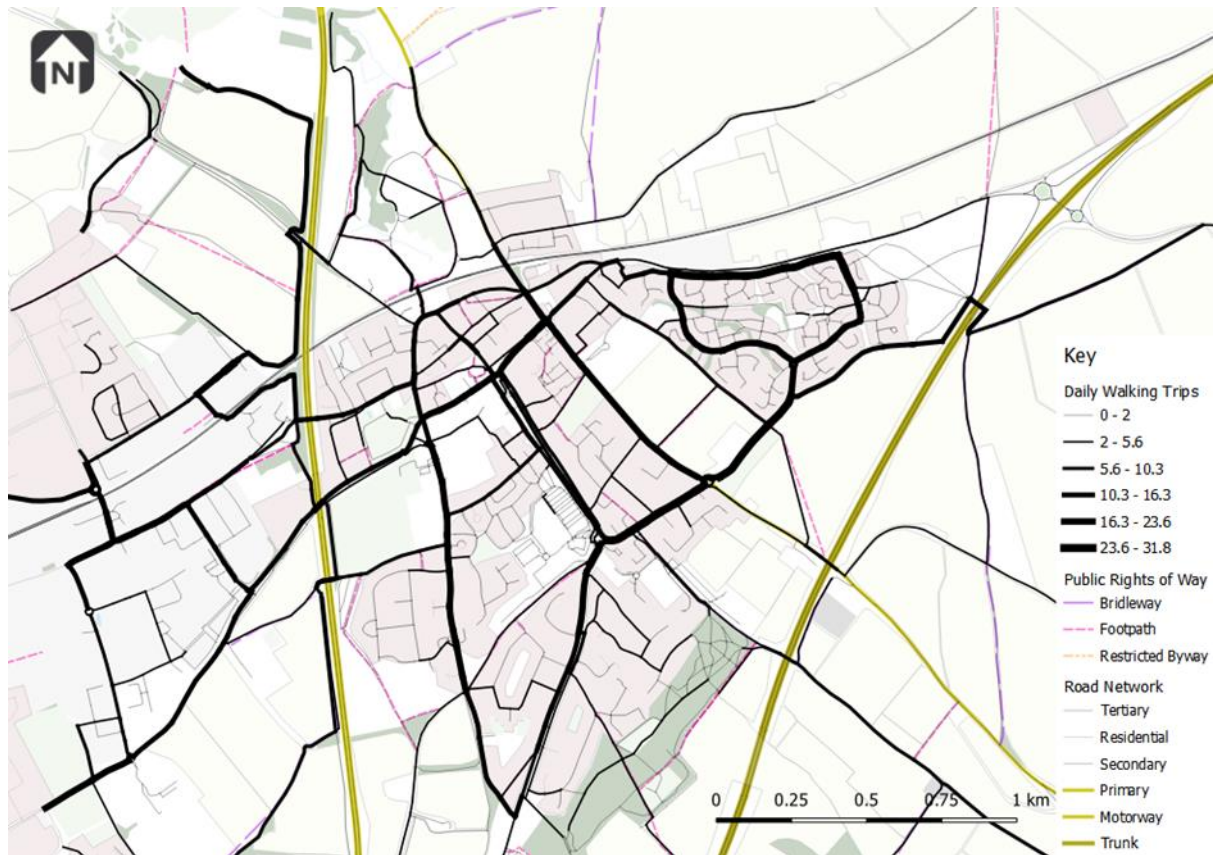
- 4.3 Strava Metro data gives a good indication of the walking and cycling patterns of an area and has been found to have the potential to be used to identify travel patterns, estimate travel demand and analyse route choices. Particularly it can be useful in predicting relative walking or cycling rates of an area, with Strava counts estimated to be generally within 5% of real time traffic counts¹¹. However, it should be noted that the data does include biases towards certain demographics of the population with males in the age range of 25-44 the most common demographic within the dataset. Therefore to increase its reliability and usefulness it should be used in combination with other data sources.¹¹

Strava Metro walking trends

- 4.4 Walking trends in Baldock see high volumes of pedestrians around Clothall Common and the town centre as seen in Figure 4-2. Around these areas, up to 30 daily trips are recorded on the app which could be equivalent to 600-3,000 walking trips in total.
- 4.5 Figure 4-2 also shows walking levels near the proposed development site and indicates that the PRowS around the development are used less frequently. This could be due to low levels of demand and / or attractiveness of the routes. There are opportunities with the new development to deliver high quality and attractive pedestrian routes to induce walking demand to the town centre and other attractions such as the country park to be delivered within the site.

¹¹ Lee, K. and Sener, I.N., 2021. Strava Metro data for bicycle monitoring: a literature review. *Transport reviews*, 41(1), pp.27-47.

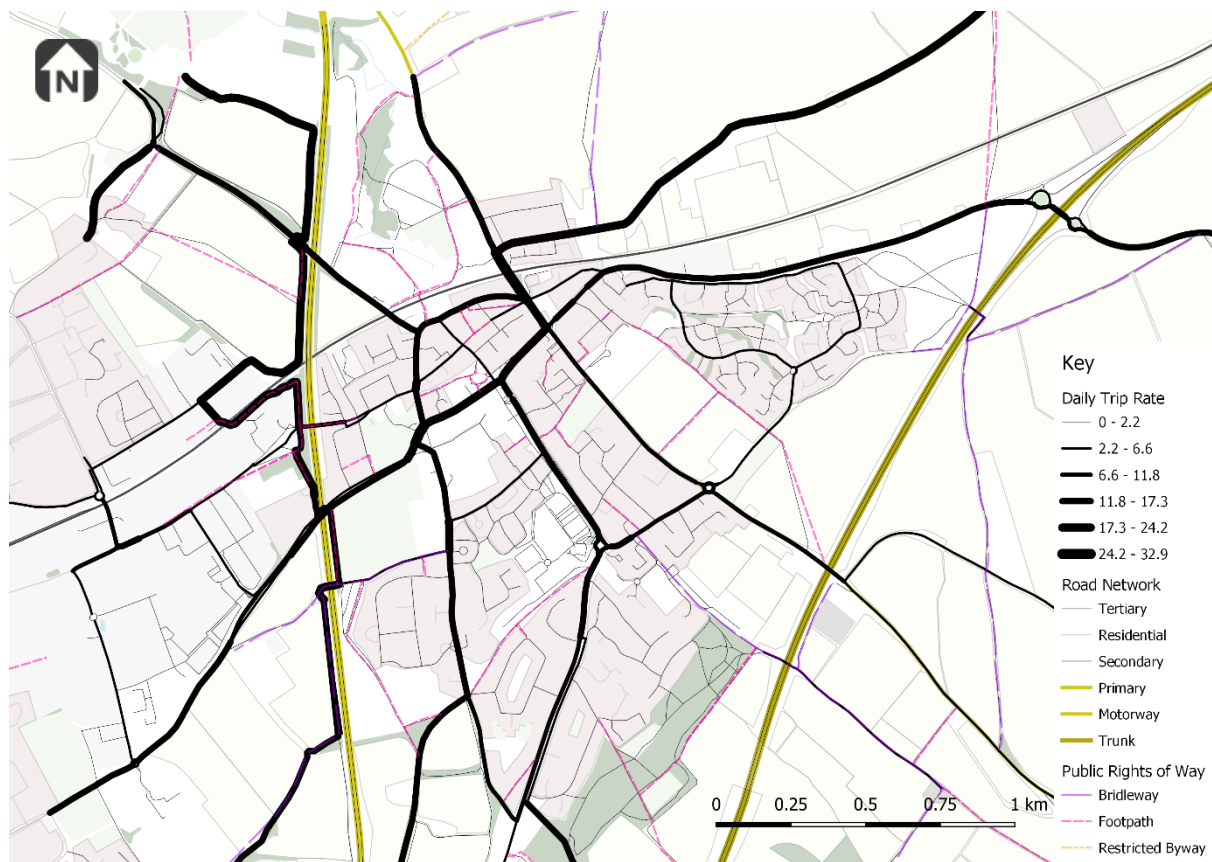
Figure 4-2: Daily walking trips around Baldock (2021)



Strava Metro cycling trends

- 4.6 Cycling data (2021) shows that cyclists tend to use the radial routes into and out of Baldock as well as the roads around the town centre (Figure 4-3). Flows are highest on Bygrave Road and Ashwell Road through the proposed development site. The peaks of 30 trips are similar to the walking rates that were calculated, which could aggregate up to between 600-3000 trips based on how representative Strava currently is.
- 4.7 The proposed development and the forthcoming link road will therefore have to be able to accommodate these levels of cycling and ensure that cycling is not discouraged in the area due to diversion or disruption.
- 4.8 When comparing the walking and cycling data, it is evident that walking trips occur in more residential areas with thicker black lines shown in Figure 4-2. This suggests that cyclists tend to stick to the more direct radial routes and arrive from locations outside of Baldock.

Figure 4-3: Daily cycling trips around Baldock (2021)

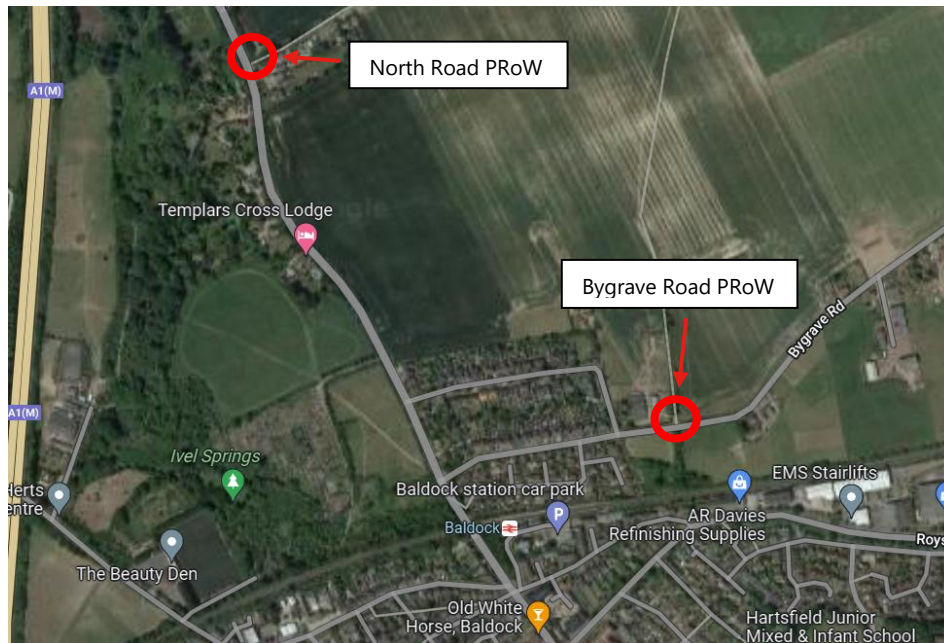


Pedestrian routes

PRoWs

- 4.9 Movements in and out of the PRoWs around the proposed development site at North Road and Bygrave Road were monitored, with locations shown in Figure 4-4. Reflecting the Strava Metro data analysis, pedestrian and cycle movements around North Road are relatively low, perhaps expected given it leads out onto the busy A507. Average daily pedestrian trips entering or leaving the PRoW at the North Road site are nine, with no significant difference between weekends and weekdays. A total of nine cyclists were recorded using the PRoW over the two-week survey.
- 4.10 The PRoW located off Bygrave Road experiences slightly more active travel movements with an average of 26 entering or leaving the site. This demand can be supported and enhanced through the proposed development and sustainable transport interventions along Bygrave Road.

Figure 4-4: PRow access locations



Pedestrian and cycle use of Station Road / Clothall Road junction

- 4.11 Additional active travel analysis was undertaken at the Station Road / B656 / Clothall Road junction. This junction provides valuable insights as it links Baldock train station to the high street and surrounding areas of Baldock.
- B656 (W) to Station Road saw the main movement of pedestrians as it connects the town centre/high street and train station, representing 28% of the total junction pedestrian movement in the PM peak
 - Station Road to B656 (W), the reverse of the trip above, represented 25% of the total junction pedestrian movement in the PM peak
 - These are also the highest movements in the weekend peak
 - All other movements were lower than 10% of the total in the PM peak
 - The next biggest movement was between B656 (W) and Clothall Road, with 8% going either to or from either arm.
 - The cyclist only movements represent around 6% of total active movements for the junction but the flows are similar in terms of direction.
 - The weekend directional flow remains similar to the weekday
 - On the weekend cyclists make up 4% of total movements
- 4.12 There are also long signal cycle times at this junction. Those using active travel to cross are likely to experience delay at this junction.

Regional origin and destination movement analysis

- 4.13 The Teralytics platform has been used, which provides origin to destination information, logging the start and end points of a journey using mobile phone data. The data is from 2021 and post pandemic related lockdowns, which provides a more up to date view on movement patterns than the 2011 Census. The data also covers all journeys, rather than just journey to work as is the case for Census. The data is able to provide very granular data as trips can be split out by Lower Super Output Areas (LSOAs) which usually contain around 2,000 people each.
- 4.14 The limitation of this dataset however is that all trips either start or end in Baldock and so an interpretation cannot be made on external journeys using Baldock as a through trip. The ANPR data analysis (paragraph 4.64) helps to give a clearer understanding of the amount of through traffic in Baldock. This used with a combination of data sources allows a better understanding of the wider movements around Baldock.
- 4.15 Figure 4-5 shows net outgoing and incoming trips from an area. It shows that in the morning that there is a flow of people leaving Baldock and a net gain in trips arriving in the centre of Letchworth. In the evening, much the opposite occurs.
- 4.16 Analysis of local movements found that:
- Significant movements between Baldock and Letchworth – this aligns with understanding of the Census data
 - 23% of trips leaving/entering Baldock are below 5km
 - Bus travel potential between these locations
- 4.17 Similar data can be viewed on a wider scale, reviewing the regional movement patterns. Figure 4-6 highlights that:
- There are significant movements into Hitchin and Stevenage
 - From this we can derive that 55% of trips are shorter than 10km
 - Car remains main mode of travel for trips between these towns

Figure 4-5: Local origin-destination movements (weekday AM Peak)

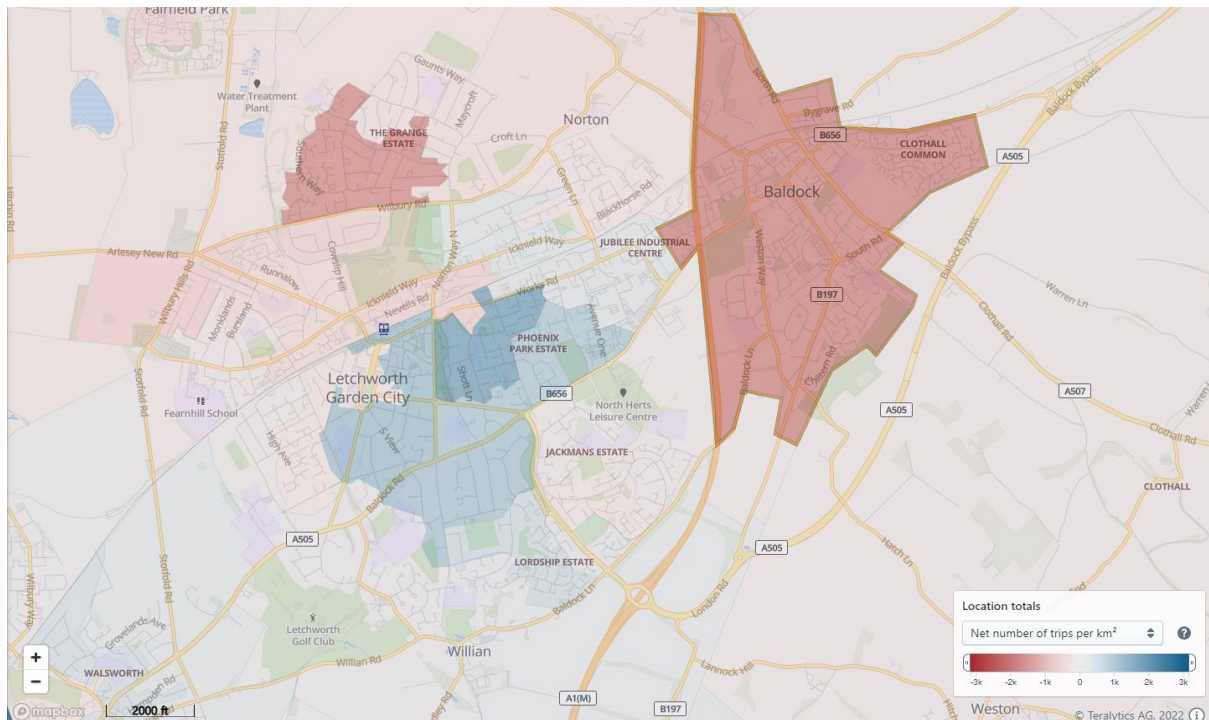
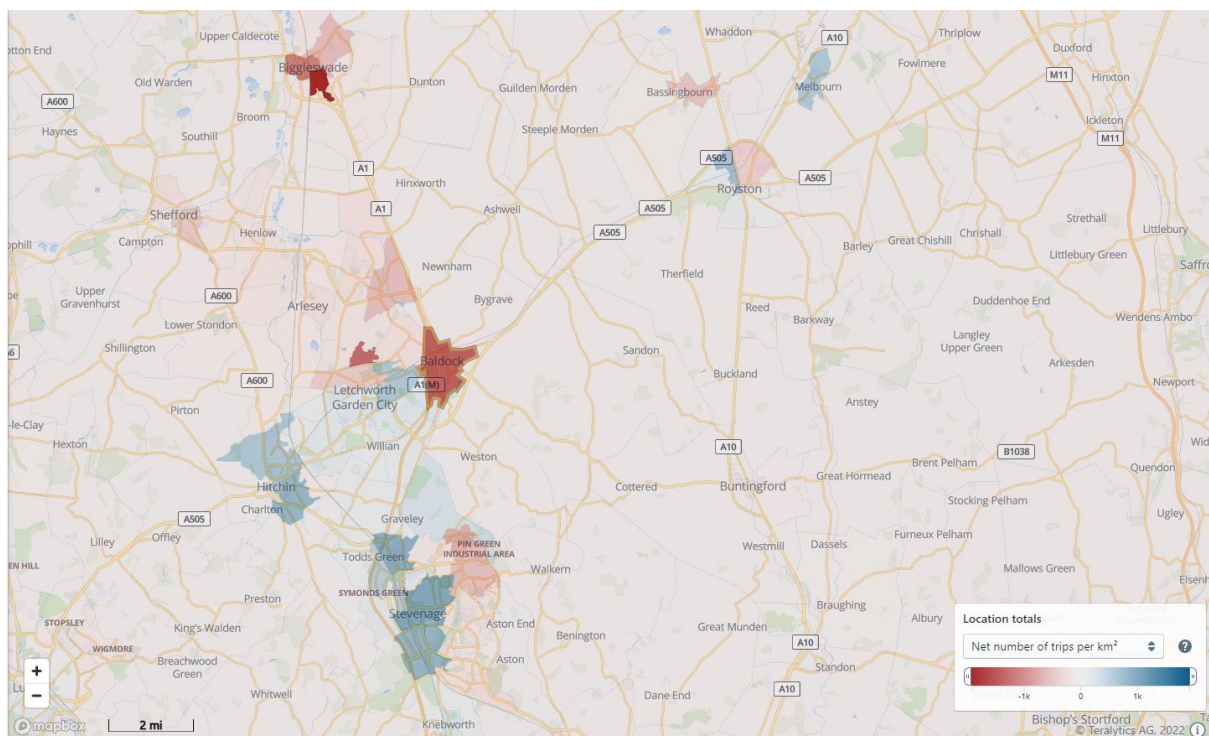


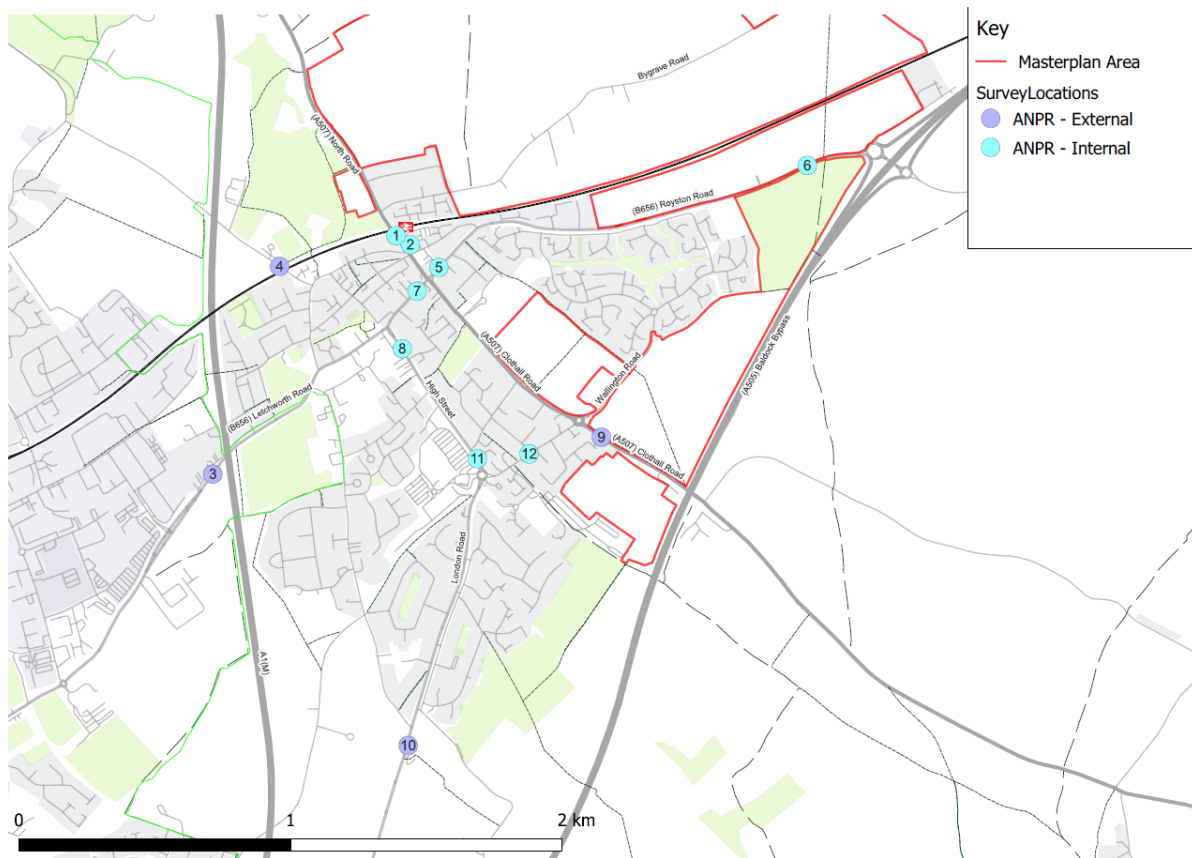
Figure 4-6: Regional origin-destination movements (weekday AM Peak)



Vehicle Survey Data Analysis

- 4.18 An Automatic Number Plate Recognition (ANPR) cordon survey was undertaken to allow a more detailed understanding of traffic movements across the town. The location of the cordon cameras for Baldock are shown in Figure 4-7. The ANPR cameras recorded the vehicle class and direction of travel for each camera, as well as the point and time the vehicle entered and left the cordon.
- 4.19 ANPR sites are either assumed to be 'External' or 'Internal'. This affects the way in which the origin-destination matching process works in relation to each site. The differences between the two types are as follows:
- External - these are sites which are assumed to be on the periphery of the study area and hence vehicles passing through these sites will be starting or ending their trip. Directions at these sites are set to Inbound and Outbound, and for sites that have vehicles travelling into the study area (i.e. they are not purely a one-way Outbound site).
 - Internal - these are sites that are considered to be possible through movement sites for longer distance origin-destination movements - i.e. they may be an intermediate capture point for vehicles seen entering and exiting the study area elsewhere. In this instance, the origin-destination movement is assigned to the initial and final capture locations. Internal sites can be the origin of a trip (if it is not captured elsewhere before) or the destination of a trip (if it is not captured again after).
- 4.20 This allows an analysis to be undertaken of traffic movements through the town, as well as information such as HGV volumes and movements and proportion of through traffic. A full breakdown of the movements in both the AM and PM peaks is provided in Appendix A.

Figure 4-7: ANPR cordon camera locations



Weekday AM + PM cumulative ANPR movements

AM + PM: Two-way

4.21 Figure 4-8 below shows the aggregated total flow from the AM and PM peak periods between 07:00 – 10:00 and 16:00 – 19:00 – all motorised vehicles. The 'top five' two-way movements are (blue arrows in diagram):

- 1219 trips between North Road (1) and Clothall Road (9) – 9% of all trips
- 907 trips between North Road (1) and Royston Road (6) – 7% of all trips
- 830 trips between Letchworth Road (3) and Royston Road (6) – 6% of all trips
- 763 trips between Clothall Road (9) and London Road (10) – 6% of all trips
- 568 trips between Letchworth Road (3) and Clothall Road (9) – 4% of all trips

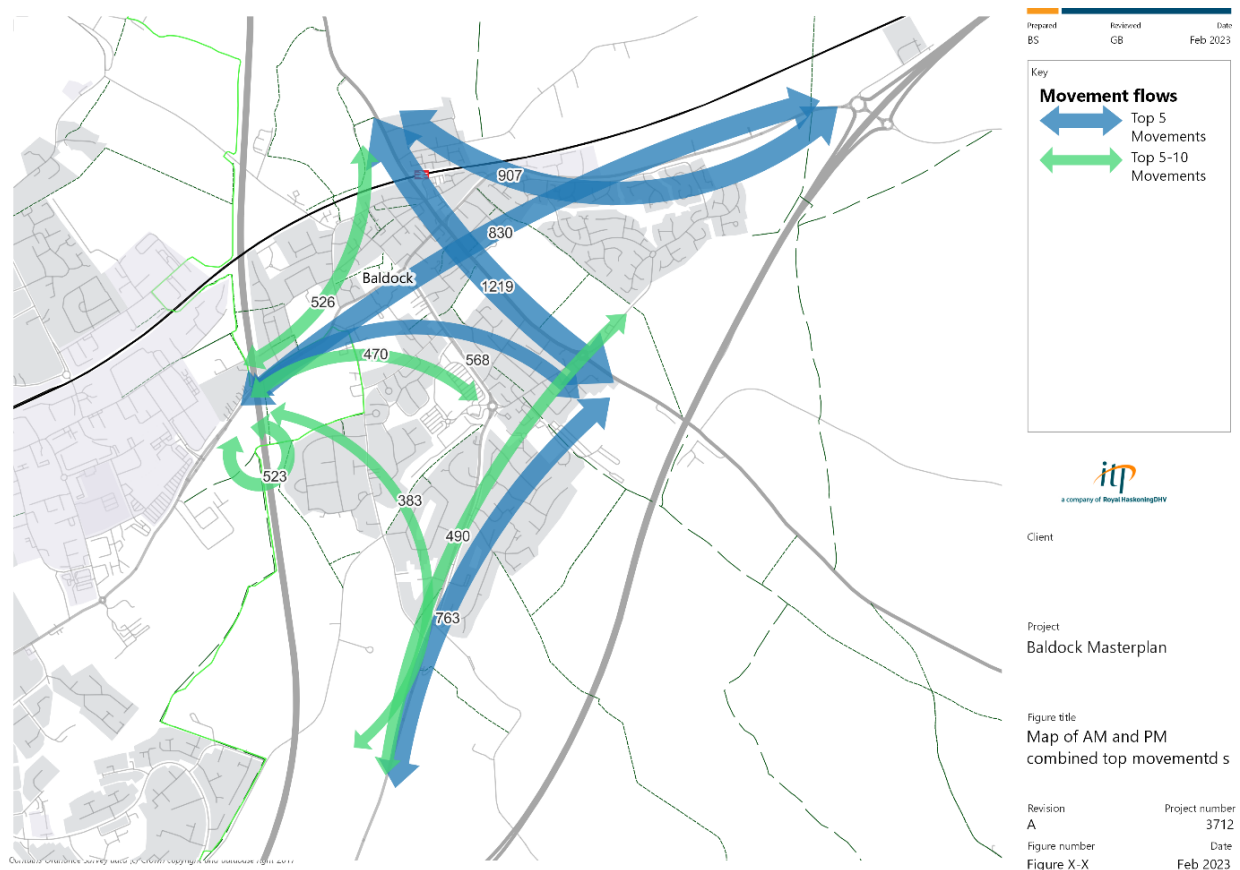
4.22 These represent a total of 33% of all trips. The remaining 'top ten' two-way movements (green arrows in diagram):

- 526 trips between North Road (1) and Letchworth Road (3) – 4% of all trips

- 523 trips between Letchworth Road (3) and Letchworth Road (3) – 4% of all trips
- 490 trips between London Road (10) and Wallington Road (12) – 4% of all trips
- 470 trips between Letchworth Road (3) and High Street (11) – 4% of all trips
- 383 trips between Letchworth Road (3) and London Road (10) – 3% of all trips

4.23 The top ten movements represent 52% of all trips.

Figure 4-8: Aggregated AM and PM weekday movements



AM + PM: Uni-Directional

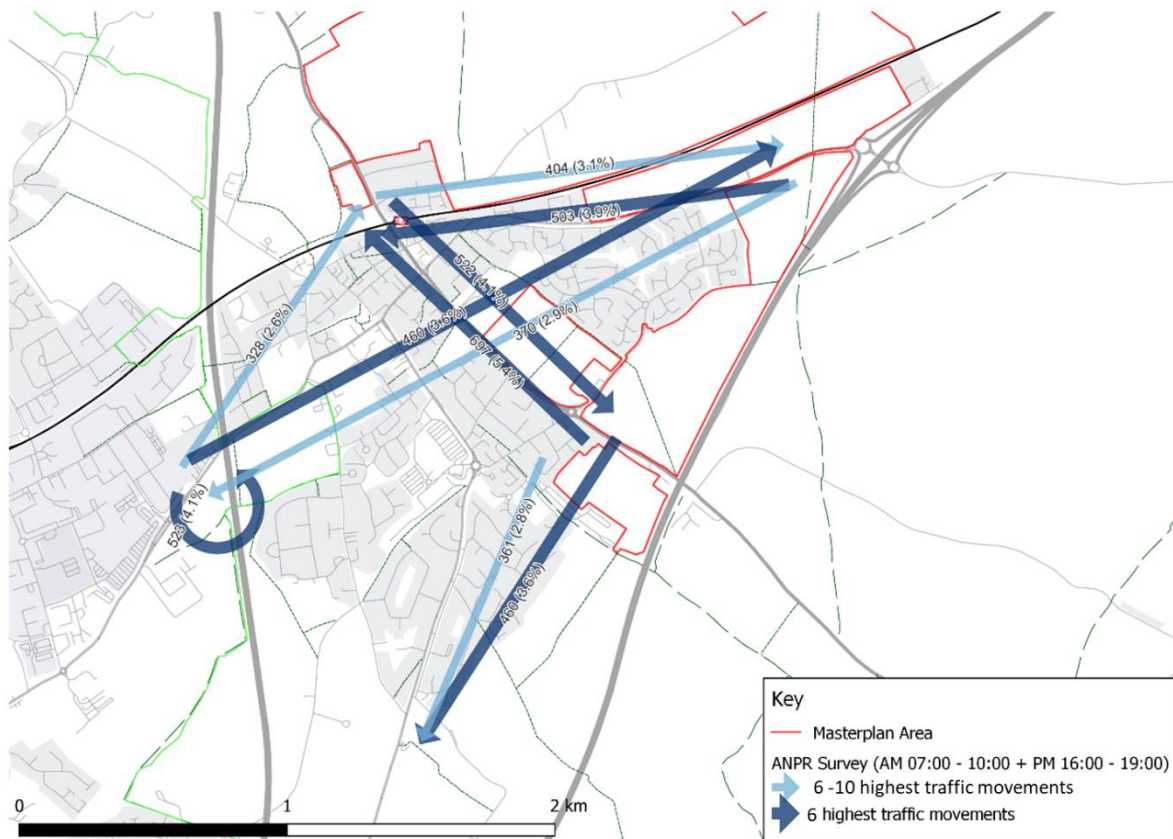
4.24 Figure 4-9 breaks the aggregated total traffic flows (AM + PM peak) down by direction. The top 10 movements are shown, along with the total vehicles recorded on that movement and the proportion of total movements this represents. In this diagram the top six movements are shown in dark blue as two movements have an equal number of movements recorded.

4.25 The 'top six' one-way movements are (dark blue arrows in diagram):

- 697 trips travelling from Clothall Road (9) to North Road (1) – 5% of AM and PM trips
- 523 trips travelling to and from Letchworth Road (3) – 4% of AM and PM trips
- 522 trips travelling from North Road (1) to Clothall Road (9) – 4% of AM and PM trips

- 199 trips travelling from Royston Road (6) to North Road (1) – 4% of AM and PM trips
- 460 trips travelling from Letchworth Road (3) to Royston Road (6) – 4% of AM and PM trips
- 460 trips travelling from Clothall Road (9) to London Road (10) – 4% of AM and PM trips

Figure 4-9: Aggregated AM and PM weekday movements (by direction)



Weekday AM Peak movements

AM Peak: Two-way

4.26 Figure 4-10 below shows the weekday AM (07:00-10:00) peak movements – all motorised vehicles. To help identify any tidal differences between AM and PM peaks, the blue arrows represent movements with broadly equal directional flow and are as follows:

- 527 trips between North Road (1) and Clothall Road (9) – 9% of AM trips
- 444 trips between North Road (1) and Royston Road (6) – 7% of AM trips
- 399 trips between Letchworth Road (3) and Royston Road (6) – 7% of AM trips
- 371 trips between Clothall road (9) and London Road (10) – 6% of AM trips

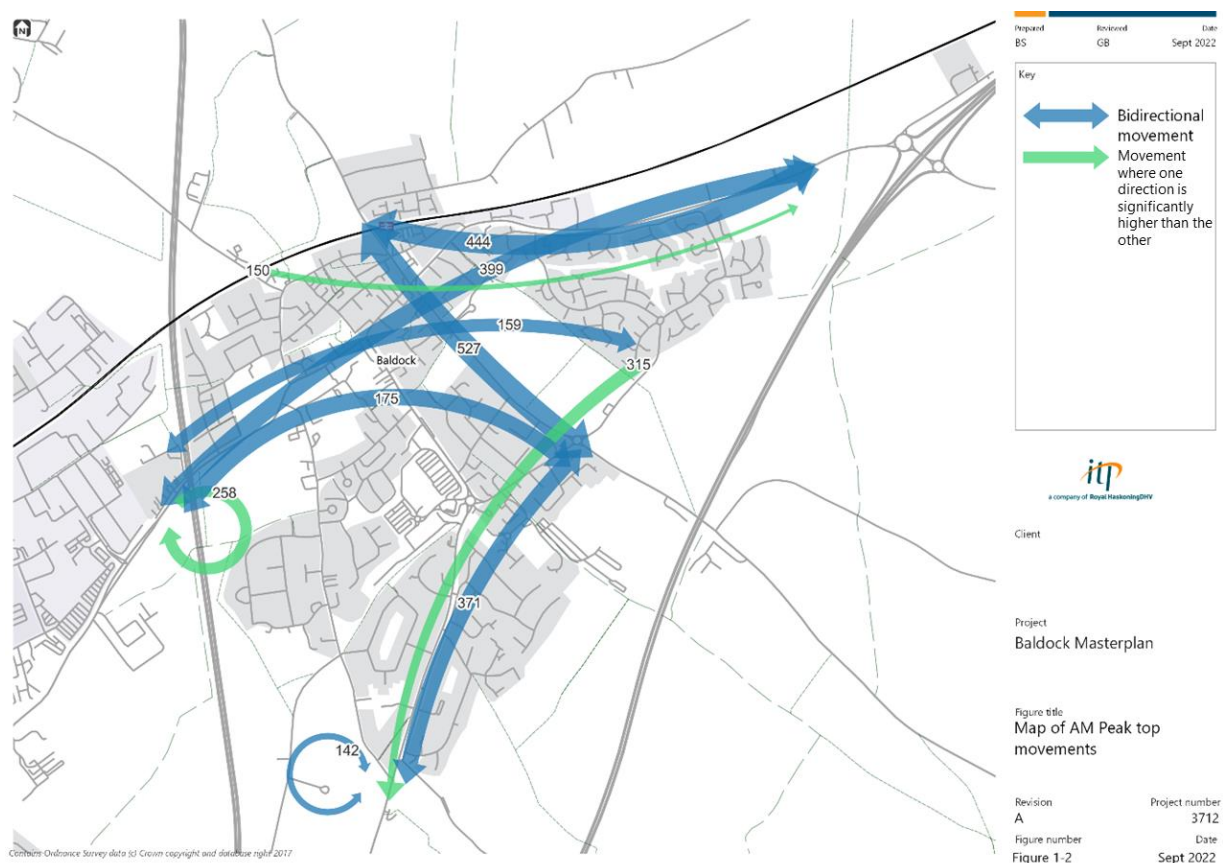
- 286 trips between Letchworth Road (3) and Clothall Road (9) – 5% of AM trips
- 258 trips between Letchworth Road (3) and Letchworth Road (3) – 4% of AM trips
- 159 trips between Letchworth Road (3) and Wallington Road (12) – 3% of AM trips
- 142 trips between London Road (10) and London Road (10) – 2% of AM trips

4.27 The green arrows represent movements where more than two thirds of trips are in one direction for a singular movement and are as follows:

- 315 trips between Wallington Road (12) and London Road (10) – 5% of AM trips
- 150 trips between Norton Road (4) and Royston Road (6) – 2% of AM trips

4.28 The top five trips represent 34% of total movements and the top ten trips represent 50% of total movements.

Figure 4-10: Total AM weekday movements



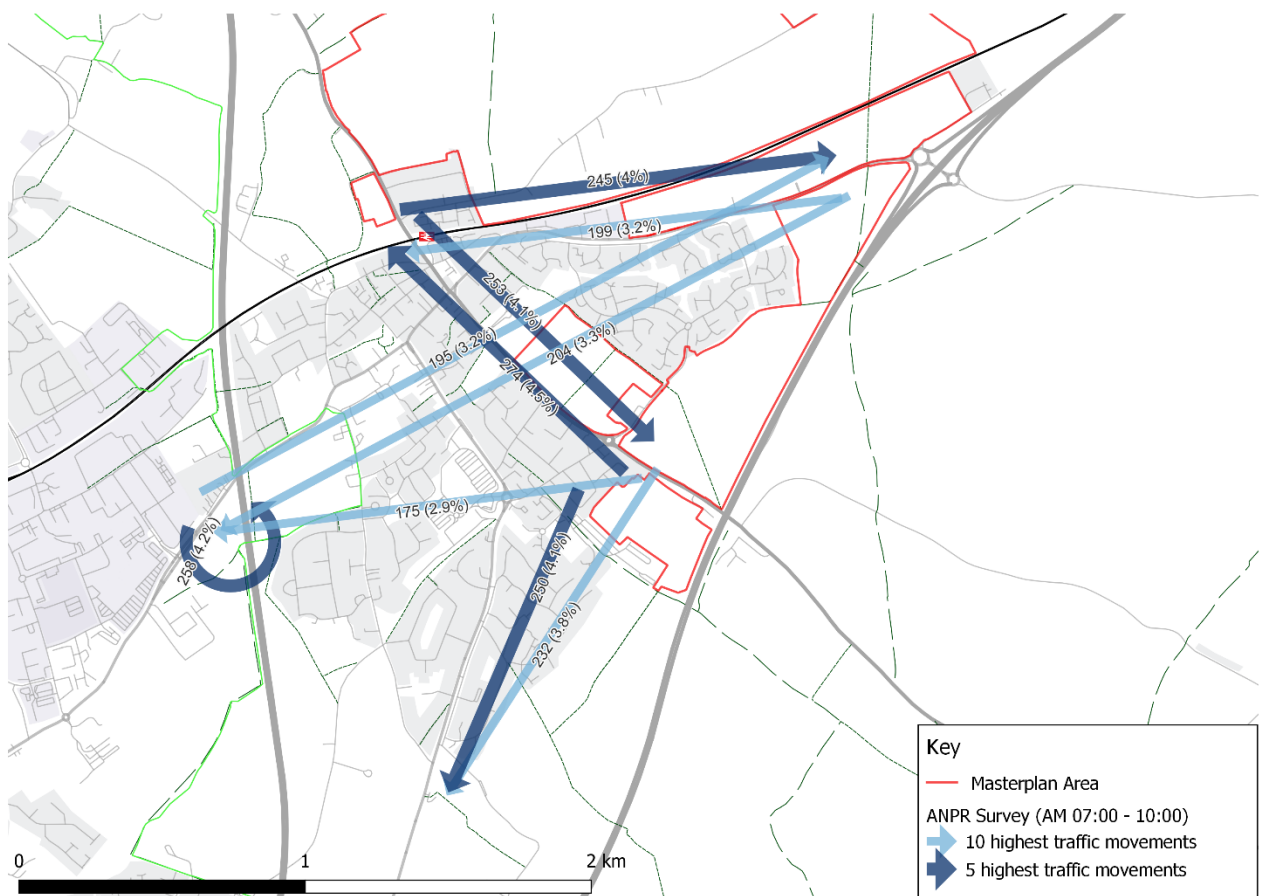
AM Peak: Uni-Directional

4.29 Figure 4-11 breaks the AM peak period traffic flows down by direction. The top 10 movements are shown, along with the total vehicles recorded on that movement and the proportion of total movements this represents.

4.30 The 'top five' one-way movements are (dark blue arrows in diagram):

- 274 trips travelling from Clothall Road (9) to North Road (1) – 5% of AM trips
- 258 trips travelling from and to Letchworth Road (3) – 4% of AM trips
- 253 trips travelling from North Road (1) to Clothall Road (9) – 4% of AM trips
- 250 trips travelling from Wallington Road (12) to London Road (10) – 4% of AM trips
- 245 trips travelling from North Road (1) to Royston Road (6) – 4% of AM trips

Figure 4-11: Total AM weekday movements (by direction)



Weekday PM peak Movements

PM Peak: Two-way

4.31 Figure 4-12 below shows the weekday PM (16:00-19:00) peak movements – all motorised vehicles. As above, the movement have been split, reflecting any tidal characteristics. The blue arrows represent movements with equal directional flow and are as follows:

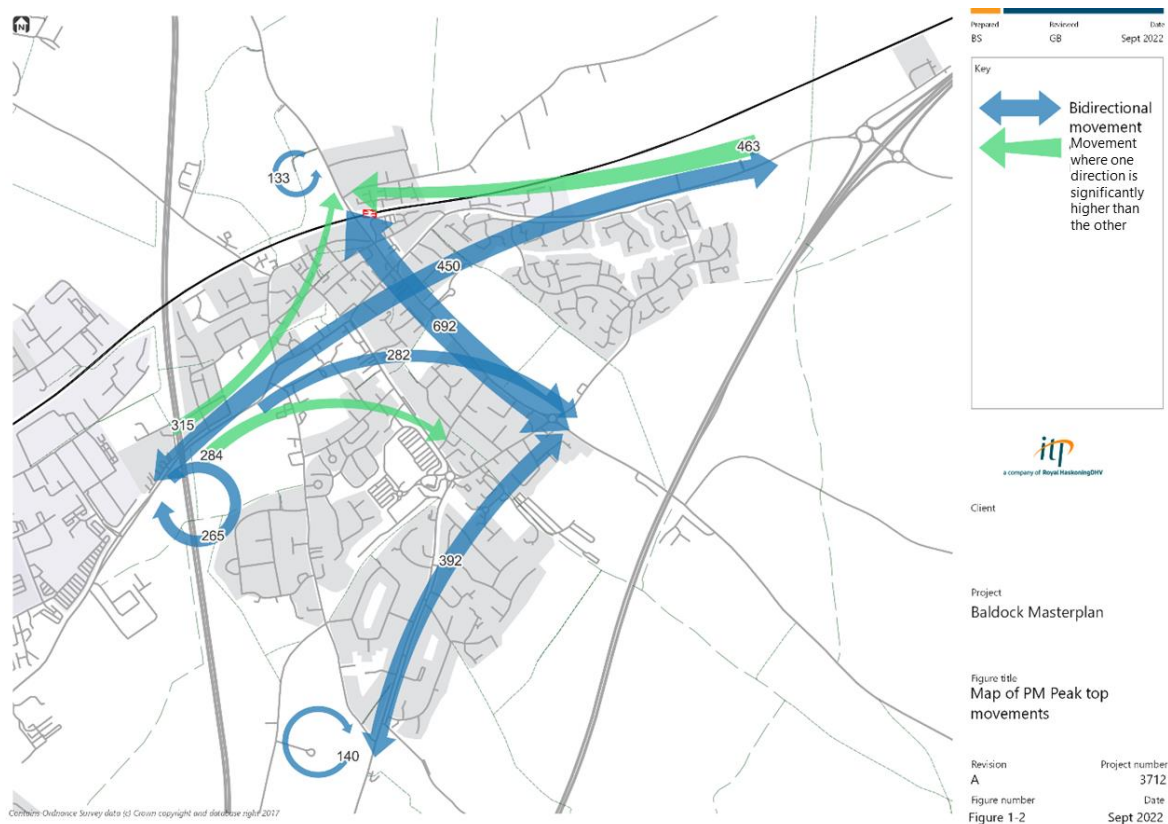
- 692 trips between North Road (1) and Clothall Road (9) – 10% of PM trips
- 450 trips between Letchworth Road (3) and Royston Road (6) – 7% of PM trips
- 392 trips between Clothall Road (9) and London Road (10) – 6% of PM trips
- 282 trips between Letchworth Road (3) and Clothall Road (9) – 4% of PM trips
- 265 trips between Letchworth Road (3) and Letchworth Road (3) – 4% of PM trips
- 140 trips between London Road (10) and London Road (10) – 2% of PM trips
- 133 trips between North Road (1) and North Road (1) – 2% of PM trips

4.32 The green arrows represent movements where more than two thirds of trips are in one direction for a singular movement and are as follows:

- 463 trips between Royston Road (6) and North Road (1) - 7% of PM trips
- 315 trips between Letchworth Road (3) and North Road (1) – 5% of PM trips
- 284 trips between Letchworth Road (3) and High Street (11) – 4% of PM trips

4.33 The top five trips represent 34% of total movements and the top ten trips represent 51% of total movements.

Figure 4-12: Total PM weekday movements



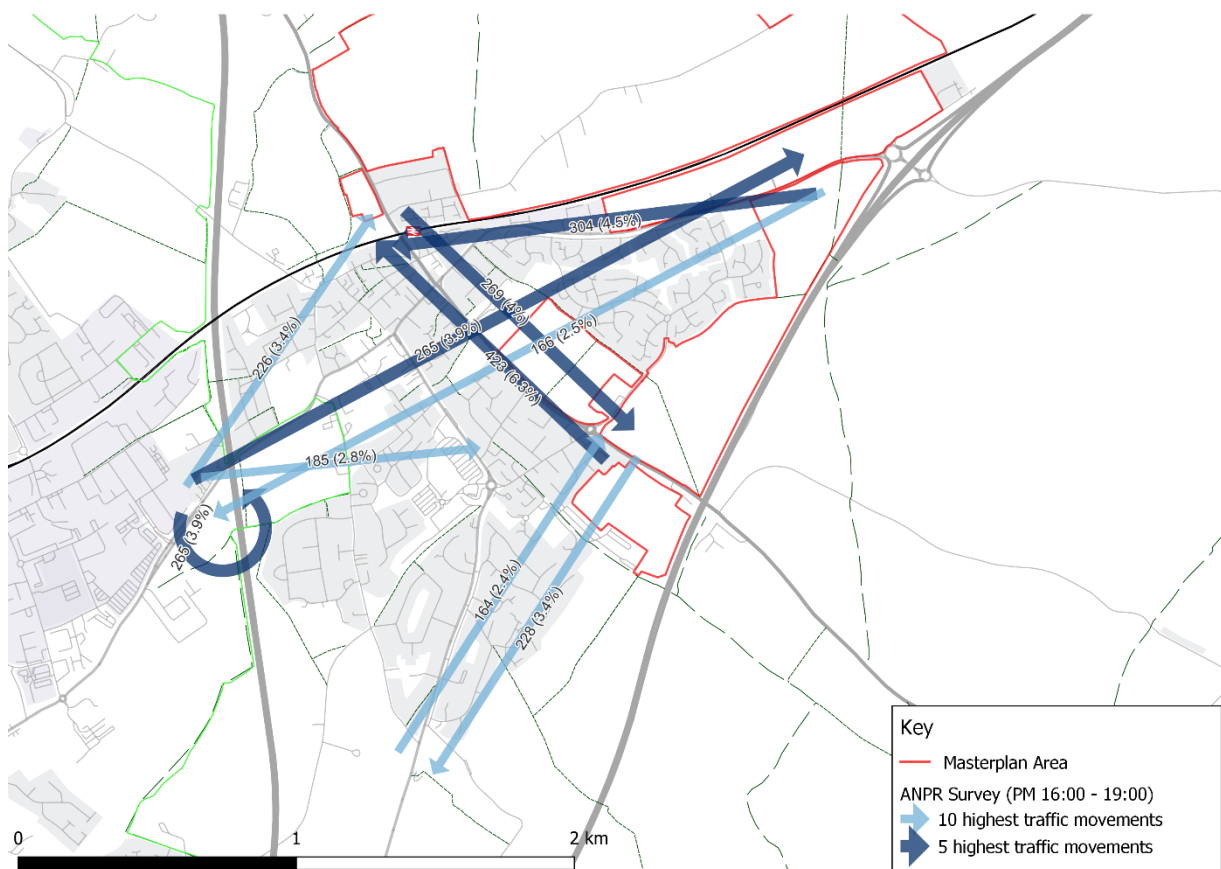
PM Peak: Uni-Directional

4.34 Figure 4-13 breaks the PM peak traffic flows down by direction. The top 10 movements are shown, along with the total vehicles recorded on that movement and the proportion of total movements this represents.

4.35 The 'top five' one-way movements are (dark blue arrows in diagram):

- 423 trips travelling from Clothall Road (9) to North Road (1) – 6% of PM trips
- 304 trips travelling from Royston Road (6) to North Road (1) – 5% of PM trips
- 269 trips travelling from North Road (1) to Clothall Road (9) – 4% of PM trips
- 265 trips travelling from and to Letchworth Road (3) – 4% of PM trips
- 265 trips travelling from Letchworth Road (3) to Royston Road (6) – 4% of PM trips

Figure 4-13: Total PM weekday movements (by direction)



4.36 Similar information is provided for the weekend survey and a HGV breakdown is provided in Appendix A.

Destinations within the cordon

- 4.37 An analysis has been undertaken of movement patterns within the cordon with a particular focus on identifying the main destinations people travel to within the cordon, and where from. The internal cameras are locations 2, 5, 7, 8, 11 and 12 in Figure 4-7. Further detail around the results of this survey and analysis can be found in Appendix A.
- 4.38 Movements ending at internal cameras represent 1,074 trips in the AM peak, which is 18% of all moments within the ANPR cordon. In the PM peak this figure is 1,261, which is 19% of all movements.
- 4.39 In both the AM and PM peaks the most popular destination within the cordon are to camera 11, which is on the High Street towards the junction with Tesco. In the AM this represents 5% of all trips and 30% of all internal trips, with the corresponding figures being 7% and 38% in the PM peak. These are likely to be trips made to Tesco predominately, as well as to the High Street. In both the AM and PM peak the most popular origin for these trips is from Letchworth Road (26% and 38% respectively).
- 4.40 In the AM peak the next most popular destination is camera 12 (South Road), representing 26% of internal trips and 4% of all trips. It should be noted that trips 'ending' at camera 12 could be accessing a range of commercial and residential destinations including the areas around London Road, including Tesco, Clothall Common and Clothall Road. The most popular origin for these trips is London Road (24%), followed by South Road itself (18%), Clothall Road (16%) and Letchworth Road (16%). The high proportion of trips only passing the South Road camera suggest a number of very local trips being made by car.
- 4.41 In the AM peak another popular destination is camera 8 (High Street north), representing 22% of internal trips and 4% of all trips. The most popular origin for these trips is Letchworth Road (19%), followed by London Road (12%), Norton Road (11%) and North Road (11%).
- 4.42 In the PM peak the next most popular destination after the High Street (Tesco end) is camera 8 (High Street north), representing 24% of internal trips and 5% of all trips. The most popular origin for these trips is Letchworth Road (28%), followed by London Road (18%), Norton Road (11%) and High Street (Tesco End) (10%). The proportion of trips only passing a High Street camera suggest a number of very local trips being made by car.
- 4.43 In the PM peak another popular destination is camera 12 (South Road), representing 20% of internal trips and 4% of all trips. As above, it should be noted that trips 'ending' at camera 12 could be accessing a range of commercial and residential destinations.

The most popular origin for these trips is London Road (25%), followed by Clothall Road (23%) and Letchworth Road (21%).

HGV Movements

- 4.44 The top five weekday AM (07:00-10:00) peak movements absolute volumes of all Heavy Goods Vehicles >3.5T were recorded between:
- North Road (1) and Clothall Road (9) – with 29 trips in the AM peak
 - North Road (1) and Royston Road (6) – with 22 trips in the AM peak
 - Letchworth Road (3) and Royston Road (6) – with 20 trips in the AM peak
 - Clothall Road (9) and London Road (10) – with 19 trips in the AM peak
 - Letchworth Road (3) and North Road (1) – with 17 trips in the AM peak
- 4.45 The top five trips represent 45% of total movements and the top ten trips represent 66% of total movements. The movements largely reflect the same pattern of all vehicles. HGV movements represent 4% of all movements in the AM peak, although for many movements HGVs represent a higher proportion of total traffic.
- Clothall Road (9) to South Road (12) – HGVs account for 16% of total trips, likely representing HGV movements to Tesco
 - North Road (1) to Royston Road (west) (6) – HGV movements account for 14% of total trips likely represents HGV movements to commercial premises at the western end of the road, with HGVs making up 27% of movements in the converse direction (from Royston Road (west) to North Road)
 - London Road (10) to Wallington Road (12) – HGV movements account for 14% of total trips
- 4.46 In the absence of cycle infrastructure proportions of HGV traffic greater than 5% will create a hostile environment for cyclists¹². Proportions of HGV traffic above this level are seen in many locations, with particular concern where traffic volumes are also high for example between Clothall Road and North Road, Royston Road to North Road, Royston Road to Letchworth Road and between Letchworth Road and North Road (both directions).
- 4.47 The HGV movements in the PM peak are substantially different to the AM peak, and to the general traffic movements recorded. Overall volumes are substantially lower with only one notable movement being recorded, being the movement between Clothall Road and North Road. Trips shorter than 30 minutes represent 90% of all movements,

¹² Based on guidance provided in LTN 1/20

suggesting most of the HGV movement are through movements. The data suggests that there is more servicing activity taking place within the town in the AM peak, as well as movement to surrounding areas.

Through traffic and pressure points

4.48 The survey data was also able to establish the level of through traffic and points in the network where congestion was particularly high.

4.49 The junctions which were chosen to be surveyed by the cameras and considered points of interest are set out below along with key findings from the analysis (the full set of information is available in Appendix A with a breakdown of peak turning movements and queue length results). As shown in Figure 4-14 the key congestion points are located along the B656, travelling through the centre of Baldock, where the queue lengths are greatest.

- **Station Road/Clothall Road junction (Site 24)** – Located in the centre of Baldock and one of the most congested junctions. The data shows that the longest queue on average occurred on the right-hand lane connecting Royston Road to Station Road. This is the movement most likely to be affected by both the proposed northern development and link road.

Additional active travel analysis was also undertaken at this junction, showing that the main active movements were between the B656 (S) and Station Road linking to the rail station and high street.

- **Hitchin Street / Whitehorse Street / High Street junction (Site 4)** – This junction also had large peak queue lengths. The high proportion (45%) of movement between Hitchin Street and High Street suggests traffic is seeking to avoid congestion at the Whitehorse Street junction, as well as avoiding congestion at J9 of the A1(M) when accessing Letchworth. The range of services including the Tesco is also likely drawing traffic along the High Street.
- **Letchworth Road / Weston Way junction (Site 22)** – This signal-controlled junction is in west Baldock. Most of the traffic (71%) remains on Letchworth Road whilst 18% travels between Letchworth Road (S) and Weston Way.
- **Bygrave Road / North Road junction (Site 9)** – The junction is close to and will be affected by, the proposed northern development site, with Bygrave Road running through the proposed site to Bygrave. The queue lengths identified were not very large and the main movement at the junction was between North Road and Station Road making up 86% of trips.

- **Clothall Road / Wallington Road junction (Site 12)** – This is an important junction to note as this connects the residential area of Clothall Common, and large queue lengths were observed on South Road. However, overall queue lengths at the junction were low suggesting the roundabout flows smoothly.
- **London Road / South Road / High Street junction (Site 19)** – The main flow identified here is between South Road and London Road (21% of total trips) with the Tesco being a key attractor. Overall, the queue lengths are low, despite having over 9,500 total movements, with most lanes having two to three vehicles on average queuing in them. This indicates that traffic on the junction flows well.
- **A1(M) junction 9** – a grade separated interchange between the A1(M) and the A505¹³. In total 25,766 trips were recorded in the peak periods. During the peak hours the highest hourly flows recorded were 4,551 and 4,874 vehicles in the AM¹⁴ and PM¹⁵ peak hours, respectively. This analysis demonstrates that the main movements at the interchange are to and from the A1(M) (SW) to the A505, with movements between the arms of the A505 also significant. In total these movements represent 87% of all movements. The movement from the A505 (SE) to the A1(M) (NE) are relatively low at 3% of the total for trips from A1(M) (NE) to A505 (SE) and 2% from A505 (SE) to A1(M) (NE). This suggests that if a more convenient link were made between the A1(M) and the A505 at J10, more traffic would be attracted along this link. Furthermore, a significant proportion of the movement between the A1(M) (NE) to the A505 (SW) at J10 are currently being made by HGV – a maximum of 25% in the AM peak and 7% in the PM peak.

¹³ The survey captures movements between on the A1(M) slip roads and the A505 only, it does not capture through movements on the main A1(M) running lanes. Arm A includes the A1(M) slips to the north east, Arm B the A505 (SE), Arm C the A1(M) slips to the south west and Arm D the A505 (NW).

¹⁴ 07:45 and 08:45

¹⁵ 17:00 and 18:00

Figure 4-14: Average queue lengths across the AM and PM peaks



- 4.50 Research suggests that increasing vehicle capacity continues to cause, sometimes significant, induced demand where new vehicle traffic occurs as a result of improvements in the network capacity¹⁶. Therefore, any strategy to remove through traffic and reduce congestion should manage vehicle access at key junctions to ensure that spare capacity is not filled by latent demand. This should be done through sustainable mode interventions which encourage active travel and promote public transport, rather than increasing car capacity.
- 4.51 Using a desktop review of likely journey times, using google data and survey information¹⁷, high levels of through traffic in Baldock have been estimated, representing over 50% of total AM and PM peak trips. This shows that a significant amount of vehicles using the roads within Baldock are not using them to access Baldock's services and facilities but instead using them to reach other destinations instead, increasing congestion and worsening conditions for active travel and public transport.

¹⁶ [Latest evidence on induced travel demand: an evidence review \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/)

¹⁷ Using Google Maps to establish the maximum 'worst case scenario' journey time in the AM and PM peaks between the perimeter cameras. Following this, when calculating the journey time between the cameras from the ANPR survey method, trips with a duration that exceeded the maximum value established from Google Maps were discarded, as it could be assumed that these trips were stopping in the town. The result of the filtering process gave the number of through trips.

Research on through traffic in comparable towns

- 4.52 The ANPR cordon data shows 51% of trips within Baldock are through traffic. Directly comparable data for other towns is not easily available. However, Table 4-1 highlights some examples of similar sized towns and data on through trips and HGVs.

Table 4-1: Table of traffic survey data from comparable towns/areas

Town	Data on through trips or HGV movements
Royal Tunbridge Wells A26 and A264	3% of all traffic classed as HGV Of this HGV traffic 28% were identified as through traffic Proportion of motorised vehicle through traffic 14% (through traffic defined as traffic then entered and exited the cordon within 40 minutes) AM peak higher proportion of HGV traffic for all junctions assessed AM peak slightly higher for all motorised vehicles for all junctions assessed
Hertford A414 Hertfordshire Count Council	20% of all A414 corridor movements passing the ANPR cordon classed as 'through trips'
Swaffham A47 and A1065	43% of the total observed "inbound trips" are through traffic Of these through trips 1% to 4% were HGV trips Maximum amount of HGVs on the network is 15%. Around 7% - 15% in the AM peak and 4% - 8% in the PM peak
Esher Traffic Survey	Average of 84% through trips 'taking less than 15 minutes to travel through cordon'. Much smaller cordon area. In the larger cordon area through trips were between 45% - 55% depending on direction of travel

- 4.53 The through trip percentage of 51% for Baldock puts it above most of the examples highlighted. It is also worth noting that the surveys in these locations were undertaken generally because there was a recognition that through traffic was causing negative impacts on the locations. Therefore, it is reasonable to conclude that through traffic levels would be higher than average in the case studies reviewed.

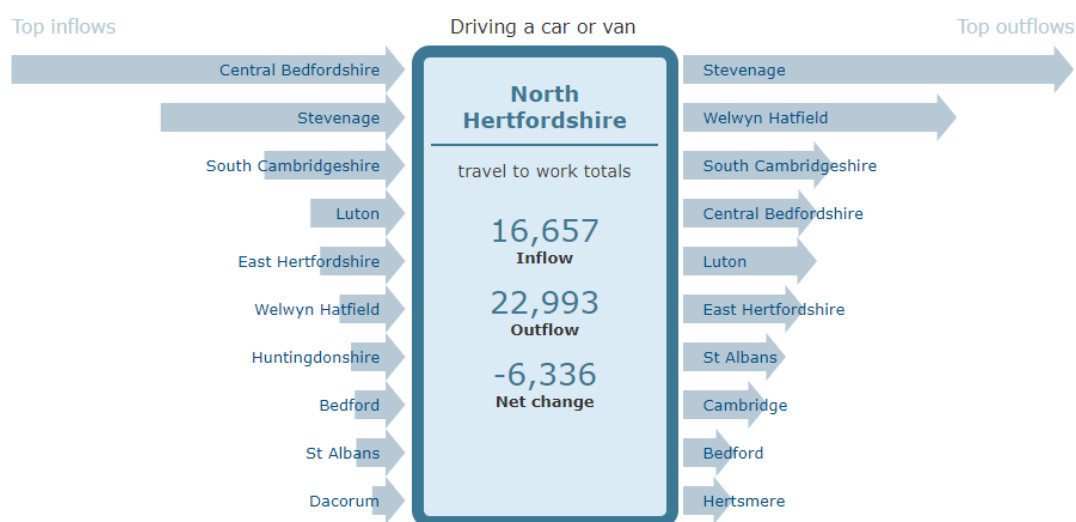
Origins and destinations of through trips

- 4.54 The ANPR survey only shows the points of entry and exit to the cordon and does not provide any data for the ultimate origins or destinations of the through traffic

recorded. However, a number of inferences can be made when studying the Strategic Road Network (SRN) in the region.

- 4.55 For locations to the northwest of the town (Biggleswade, Bedford) and potentially further west such as Milton Keynes, trips to the southeast such as to Essex and Stansted are indirectly made via the SRN. Therefore, the connection through Baldock via the A507 is likely to be shorter. Local through trips are also likely to be a factor, for example the villages to the southeast of the town are likely to use the A507 to make trips to access the SRN and locations to the northwest. Many trips are also likely to be made from Letchworth through Baldock to access the SRN, either via North Road (to the A1(M)) or Royston Road (to the A505).
- 4.56 The Census data (2011) provides some corroboration of the regional movements described above, with large flows into and out of North Hertfordshire from Central Bedfordshire, as well as East Hertfordshire.

Figure 4-15: Census 2011 flow diagram for commuting movements (North Hertfordshire)



Rail station

- 4.57 Baldock Train Station had around 650,000 yearly passenger entry and exits over 2019/2020, equivalent to around 1,500 per day. Total entries and exists dropped dramatically over the course of the pandemic to 154,000 in 2020/2021. More recent figures, unaffected by lockdowns, are not currently available.
- 4.58 The total number of pick-ups and drop-offs, taken on a particular weekday, appeared relatively low (25 in the AM peak and 37 in the PM peak), suggesting a significant proportion of station users walk to the station or are dropped off elsewhere. There are

also a greater number of weekend peak pick-ups and drop-offs per hour than in the weekday peak, indicating a significant amount of leisure trips taking place to and from the station. More detail on these numbers and the other rail station survey analysis can be found within Appendix A.

- 4.59 Regarding car parking accumulation, the survey data indicated that the weekday peak occupancy is 61% (occurring at 4pm), with an average occupancy of 33% in the AM peak and 48% in the PM peak, suggesting that the car park fills up during the day rather than being filled with vehicles early. Over the weekend peak, the occupancy rate is lower at 20%, an interesting comparison with the higher number of weekend peak pick-ups and drop-offs than in the weekday. This suggests that day visitors to Baldock at the weekend are perhaps getting taxis to the station but not parking in it, or people are travelling from Baldock to other destinations and getting friends or family to drop them off.
- 4.60 Cycle parking survey data shows a greater number of cycles during the weekdays than the weekend, although the total numbers are low given the overall use of the station. This also suggests that most people parking their bikes are commuters, as there are more cycle arrivals in the weekday AM peak and more departures in the PM peak.
- 4.61 The low usage of car and cycle parking suggest that the rail station serves a local catchment, and this should be strengthened and enhanced, through which a focus should be on prioritising accessibility for public transport and active modes. This is especially pertinent given the congestion issues at the junctions surrounding the station, particularly the Station Road/Clothall Road junction.

Data Summary

Key Movements

- 4.62 Overall the research presented above suggests that a significant proportion of trips are relatively local, with 23% less than 5km and 55% less than 10km. Shorter trips have high potential to be effectively facilitated by sustainable modes, particularly where they are concentrated to a few key movements. Reviewing these existing key movement patterns can help to identify the most likely destinations residents of the site, as they seek to access the same work / education / healthcare / leisure opportunities.
- 4.63 Data analysis of existing destination movements from Baldock has incorporated a number of datasets and qualitatively identified six local key movements (shown in Figure 4-16), with larger volumes indicated with the wider arrows, that could originate from the site. These will form the focus of an active and sustainable travel strategy, and include:

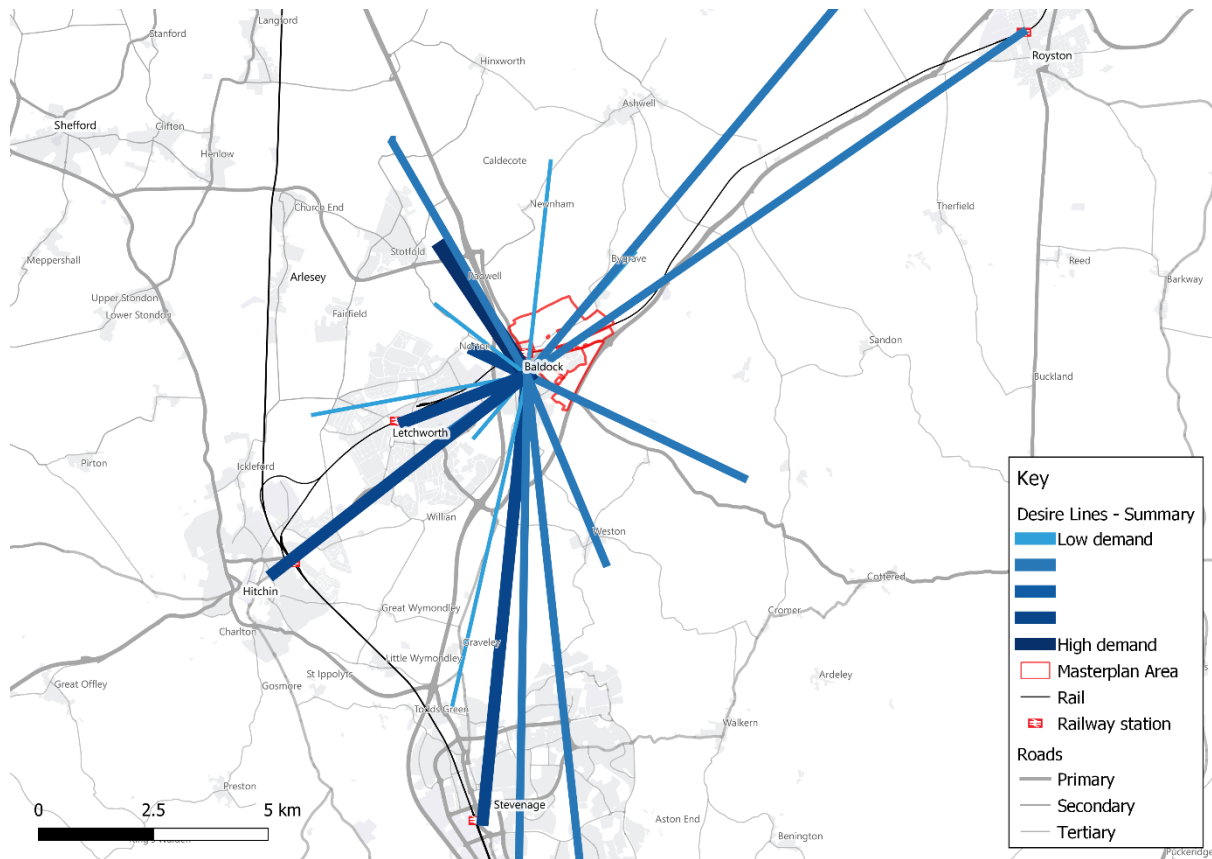
Figure 4-16: Key local movements

- 1) Letchworth town centre via business park
- 2) To station
- 3) To Baldock
- 4) To Hitchin and Stevenage
- 5) To Bygrave
- 6) Connecting to ROWs



- 4.64 Figure 4-17: also includes wider distance key movements from / to Baldock itself. These destinations are also accessible by existing public transport connections and highlight the importance of high-quality provision and access to key transport hubs. Key locations include wider region trips to Cambridge and London.

Figure 4-17: Key Movements Summary



Key findings

4.65 From the extensive primary data collection exercise as well as review of existing data sources summarised above (and more fully in Appendix A), several key findings have been identified:

- A significant proportion of trips are relatively local (23% less than 5km, 55% less than 10km)
- The main area of pedestrian activity is around the High Street and around Clothall Common / Wallington Road / South Road, with more limited numbers travelling in the area north of the railway station
- Cyclists use some of the more direct radial routes, including Bygrave Lane and the B656 as well as the A507 to the north and existing NCN route parallel to the A1
- Local bus services have low frequencies, and is reflected in the existing bus journey to work mode share data, particularly to the east of Baldock
- Rail provides a method of travel to work for 7-11% of Baldock's residents

- The low car and cycle parking accumulation suggests that the rail station serves a local catchment and that this should be strengthened and enhanced
- The car is the main mode of travel for regional trips between Baldock, Hitchin and Stevenage
- There are high levels of through movements in the town – around 50% of trips are passing through the town without stopping
- There are a number of very local trips being made by car
- Wider east-west and north-south movements will remain unchanged with a link road through the northern site and therefore a response that manages these movements in a different way is required
- 90% of all HGV movements are shorter than 30 minutes, suggesting most are through movements
- Any strategy that removes through traffic should manage vehicle access to ensure that capacity is not filled by latent demand

5. Accessibility Audit

- 5.1 Creating sustainable places is not just about being able to access facilities in a reasonable amount of time; route quality is also important to making the mode an attractive prospect for users, supporting safety and confidence along the route.
- 5.2 The datasets reviewed above have informed understanding of existing travel patterns and key destinations around the masterplan area as well as wider trips to and from the town. Consideration has been given to the catchment of reasonable walking and cycling distance of the proposed development and locations of key facilities in these areas, along with likely routes taken to these places. This has formed the basis for the scope of streets to audit for their walking and cycling quality as well as characteristics to promote better health outcomes, using industry established frameworks.

Methodology

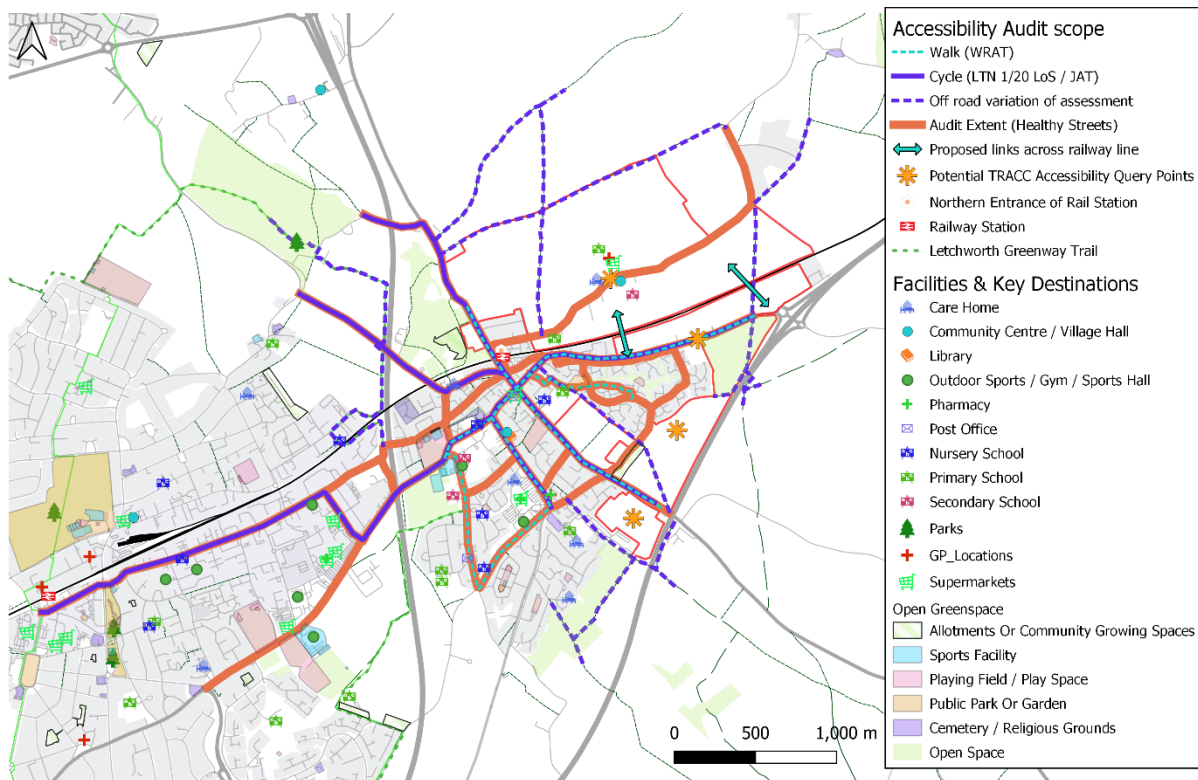
- 5.3 Three types of audit were carried out, covering walking, cycling and Healthy Streets considerations according to the North Herts District Council Masterplanning Guidance on Transport (section 10.6 on auditing existing links) and in line with Government guidance. These comprised:
- **Healthy Streets:** Design Check UK (Healthy Streets)
 - **Walking:** The DfT's Walking Route Audit Tool (WRAT)
 - **Cycling:** LTN 1/20 Cycling Level of Service Tool (CLOs). Junctions were assessed using the LTN 1/20 Junction Assessment Tool (JAT)
- 5.4 These considered several audit specific metrics, which combined to score each link against a number of indicators. These included criteria related to route attractiveness, comfort, directness and safety.

Scope

- 5.5 The scope of the streets for inclusion were determined through prior desktop research and agreement with stakeholders, with some links having multiple audits. The spatial scope of the audits is shown in Figure 5-1. Streets were split into multiple links where the character of the street changed notably and/or where a junction marked the end of a street. All junctions were assessed, unless they were access roads, and were allocated to a link, usually the major arm, to avoid double counting. For questions that could not be determined on-site, such as cycling network density or gradient, desktop research was undertaken.

- 5.6 Some of the links within the scope are non-vehicular routes and it was considered that some of the metrics on the standard frameworks were not appropriate for application to these off-road routes. An amended methodology was applied to audit these links.
- 5.7 The full auditing criteria and results can be found in the full Accessibility Audit Report in Appendix B.

Figure 5-1: Accessibility Audit Scope



Key Findings – Healthy Streets

- 5.8 The [Healthy Streets Design Check UK](#) contains ten indicators, measured via a combination of 19 metrics (shown in Figure 5-2), for assessing key elements of the on-street experience to assist designers and engineers to prioritise and balance social, economic and environmental sustainability improvements in an area. Each metric is scored against a four-point scale (0-3), as determined by the Design Check spreadsheet. These feed into scores for each indicator and overall score, measured as a percentage.
- 5.9 A Healthy Streets audit should be used on streets where people are expected to walk and cycle, measuring how safe, welcoming, and comfortable the design is currently, and providing a starting point for consideration of design changes to improve the experience for these users.

5.10 The ten indicators are as follows:

- 1) Everyone feels welcome
- 2) Easy to cross
- 3) Shade and shelter
- 4) Places to stop and rest
- 5) Not too noisy
- 6) People choose to walk and cycle
- 7) People feel safe
- 8) Things to see and do
- 9) People feel relaxed
- 10) Clean air

5.11 An overall score out of 100 is generated by averaging the scores from the ten indicators noted above. This method places greater emphasis on some metrics which are included across multiple indicators, such as the motorised vehicle speed metric which is included in seven of the ten indicators, whereas quality of the footway surface only forms part of three of the indicators. Information on how the score is generated can be found [on the Healthy Streets website](#).

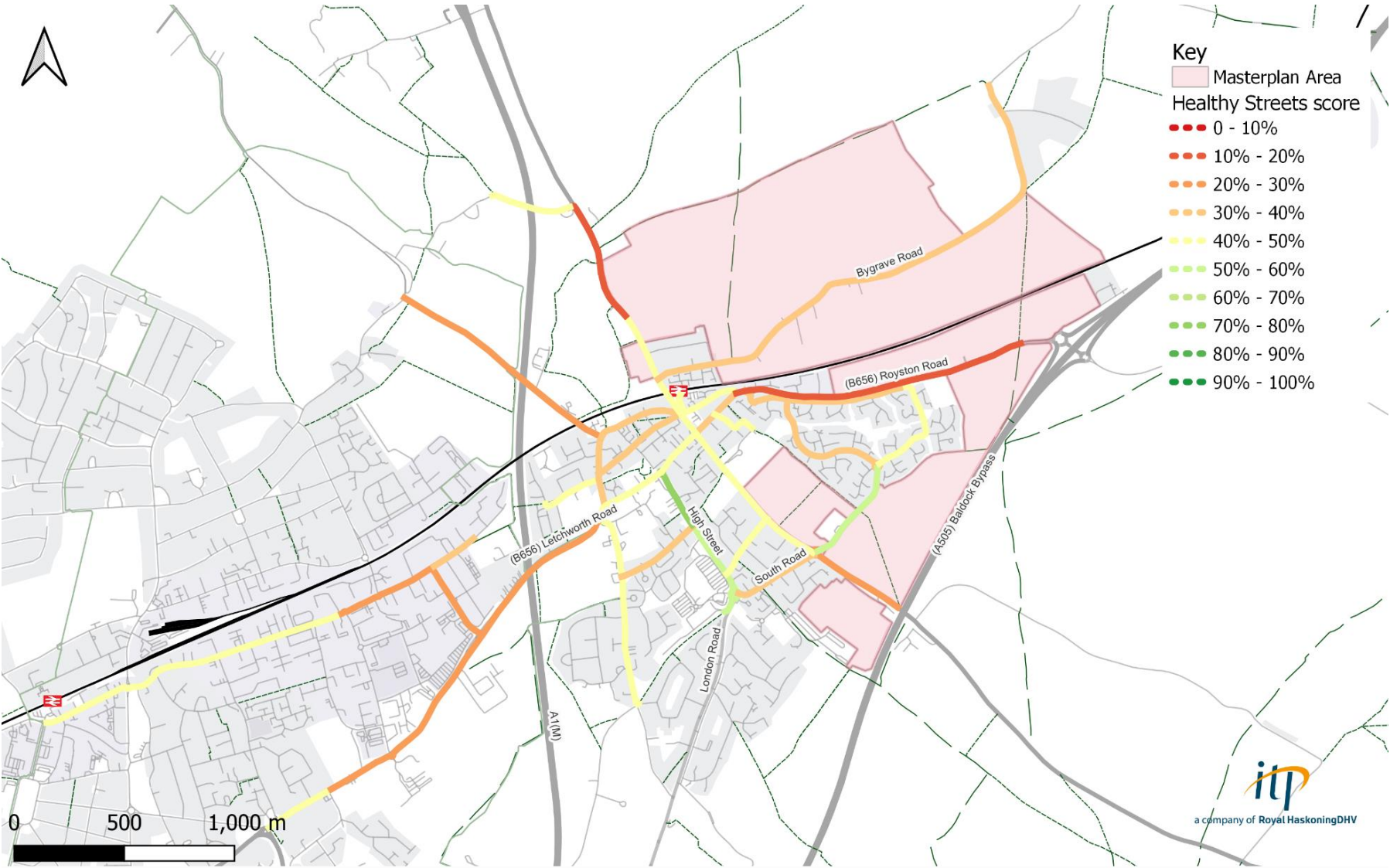
Figure 5-2: Healthy Streets Indicators and Metrics

Metric	Everyone feels welcome	Easy to cross	Shade and shelter	Places to stop and rest	Not too noisy	People choose to walk and cycle	People feel safe	Things to see and do	People feel relaxed	Clean air
1 Motorised vehicle speed	●	●			●	●	●		●	●
2 Volume of motorised traffic	●	●			●	●	●		●	●
3 Mix of vehicles	●	●			●	●	●		●	●
4 Cycle safety at junctions	●					●	●		●	
5 Ease of crossing side roads	●	●				●	●		●	
6 Ease of crossing between junctions	●	●				●	●		●	
7 Priority of crossing at junctions	●	●				●	●		●	
8 Navigation of crossings for people with visual impairments	●	●				●	●		●	
9 Quality of the footway surface	●					●			●	
10 Space for walking	●			●		●	●		●	
11 Quality of the carriageway surface	●				●	●	●		●	
12 Space for cycling	●			●		●	●		●	
13 Public seating	●			●		●		●	●	
14 Cycle parking	●			●		●			●	
15 Trees	●		●			●		●	●	
16 Green infrastructure	●					●		●	●	
17 Lighting	●					●	●		●	
18 Reducing convenience of driving short journeys	●	●			●	●	●		●	●
19 Bus stops	●		●	●		●			●	

5.12 For the 42 links audited in Baldock using the Healthy Streets Design Check, the average score was 40%, with a range of 18% to 77%, indicating several metrics where potential improvements could be made to better the experience of all those who are walking or wheeling. The two indicators that scored lowest across the audited links were 'Place to stop and rest' and 'Things to see and do', with an average of below 30%. The function of each street should be considered when looking at potential improvement opportunities, with some streets focusing more on movement than establishing a sense of place. Eighteen of the 42 links had bus stops on them, while many stops provided a high standard of infrastructure provision, some specific locations were identified where provision was more limited.

5.13 A visual summary of the audit results is shown in Figure 5-3, with the full analysis provided in Appendix B.

Figure 5-3: Healthy Streets audit results

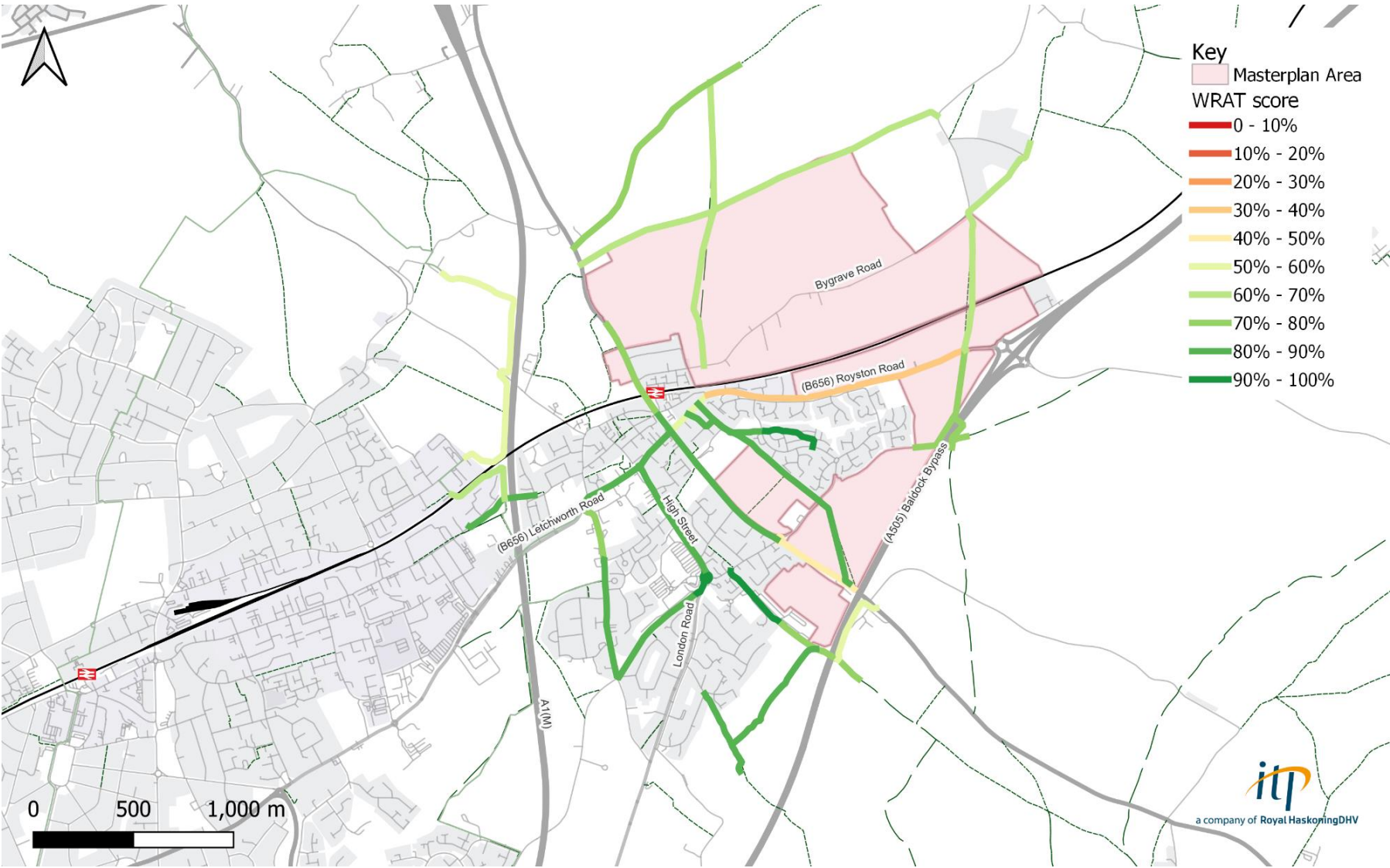


Key Results – Walking Route Audit Tool

- 5.14 Thirty-three links were audited using the Walking Route Audit Tool (WRAT). This tool was developed as part of the Welsh Government Active Travel Design Guidance to assist Local Authorities in auditing walking routes, and is now widely used by the DfT. This follows a methodology targeting the five core design outcomes for pedestrian infrastructure, which are similar to those for cycling and comprise:
- **Attractiveness** – maintenance, fear of crime, traffic noise and pollution and other (including guardrails, bollards, refuse or lighting)
 - **Comfort** – condition, width of footways and crossings, parking, gradient and other (including poor drainage, barriers restricting access and temporary obstructions)
 - **Directness** – provision of route and crossings in relation to desire lines, gaps in traffic or impact of controlled crossings and other (including routes to/from bus stops, confusing layouts and steps)
 - **Safety** – traffic volumes, speeds and visibility
 - **Coherence** – provision of dropped kerbs and tactile paving
- 5.15 The criteria were reviewed on a three-point scale:
- 0 for poor provision
 - 1 for provision which is adequate but should be improved if possible
 - 2 for good quality provision
- 5.16 A score of 70% should normally be regarded as a minimum level of provision overall. Further information on the assessment method can be found in Appendix B
- 5.17 Some links were audited as off-road routes, these included non-vehicular footpaths or bridleways. These were largely undertaken in line with the walking audit set out above, but with some less-applicable questions removed from the assessment framework.
- 5.18 Metrics that were excluded from the on-road walking assessment:
- 7 - Comfort - Width on staggered crossings / pedestrian islands/refuges
 - 14 - Directness - Impact of controlled crossing on journey time
 - 15 - Directness - Green man time
 - 17 - Safety - Traffic Volume
 - 18 - Safety - Traffic Speed

- 5.19 The results of the off-road assessment are presented alongside the on-road walking audits in Figure 5-4, expressed as a percentage of the maximum potential score, considering the number of metrics counted within this adjusted framework.
- 5.20 Overall, links scored well, in a range of 40%-98%, with an average of 78%. Coherence, namely dropped kerbs and tactile paving, was the lowest scoring category, with an average of 52%, however this was the only question within this category and so it may be unfairly weighted. Directness and safety were the highest scoring on average (both 88%), although comfort was the metric with the most consistent across all links (range 42%-70%).
- 5.21 Comfort, particularly width, was a lower scoring category throughout the WRAT, both in terms of width of footways and crossings. This is particularly the case for the weakest link, Royston Road which is discussed in more detail below. A zero score was given when footways were less than 1.5m wide, which over a third (37%) of surveyed links were.
- 5.22 A visual summary of the audit results is shown in Figure 5-4, with the full analysis provided in Appendix B.

Figure 5-4: WRAT audit results

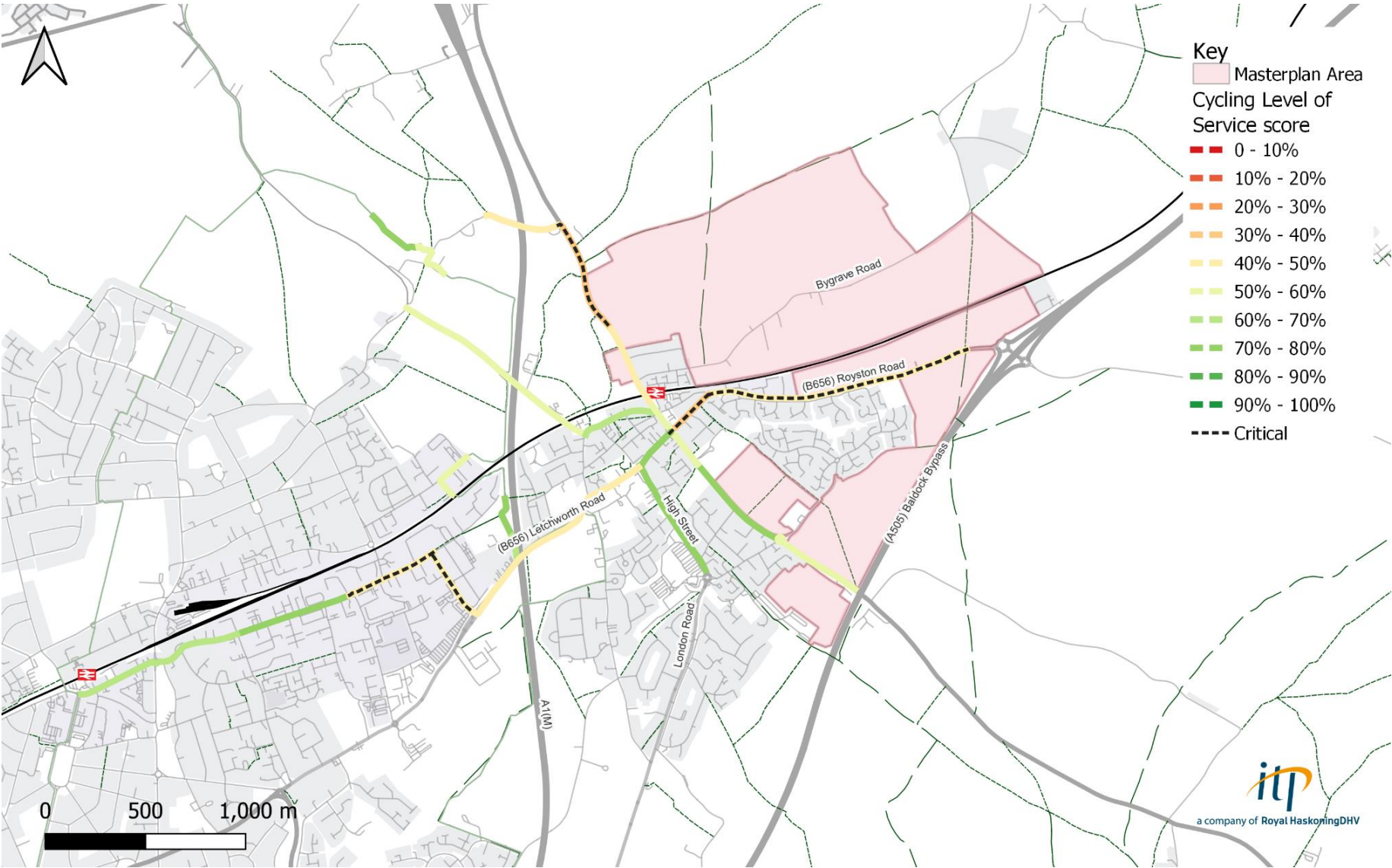


Key Results – Cycling Level of Service Tool and Junction Assessment Tool

- 5.23 The Cycling Level of Service Tool (CLOs) and Junction Assessment Tool (JAT), set out within the [Cycle Infrastructure Design LTN1/20](#), offer frameworks to ensure that a scheme conforms to good practice and that it is accessible and safe. They include a simple scoring assessment based on attributes of the five design criteria, which can be used to identify strengths and weaknesses, and therefore what the design needs to address. The CLOs tool includes some factors that are considered to be 'Critical Fails' – results that represent unsafe conditions for cycling which must be addressed (or an alternative route found). Further information is contained within [Cycle Infrastructure Design LTN1/20](#).
- 5.24 There are five core design principles which represent the essential requirements to achieve more people travelling by cycle or on foot, based on best practice both internationally and across the UK. These design principles form the basis of the audit framework and comprise:
- **Cohesion** – connections, continuity and density of network
 - **Directness** – distance, frequency of give ways, delay at junctions and links and gradient
 - **Safety** – vehicle speed and volumes, collision risk and severity, junction layout, road marking legibility and kerbside conflict
 - **Comfort** – surface type and quality, width and wayfinding
 - **Attractiveness** – lighting, isolation, pedestrian impact, street clutter and cycle parking provision
- 5.25 Baldock scored an average of 57% (with a 33% minimum and 77%) across the 26 links audited. Five of these links had at least one critical fail, within the categories of risk of collision, motor traffic speed and kerbside conflict. The audit scores can be found in Appendix B.
- 5.26 The audit work suggests that most areas of Baldock could be improved, although road surfaces were of fair quality. Cyclists generally shared the road with vehicles, with a lack of any segregated infrastructure. Aside from cycle parking on the High Street, there was limited dedicated cycle parking provision.
- 5.27 The JAT, which focused on cycle movements at junctions but does not directly feed into the CLOs, did not result in any scores above a zero (unsafe for cyclists), with only two links surveyed scoring a two (separated traffic streams).

- 5.28 The weakest category was risk of collision, where all but two links scored a zero, this is due to high traffic volumes with at least 2% being HGVs. This feeds into the general lack of cycle lanes and space for cyclists, with width being a weak category as well.
- 5.29 A visual summary of the audit results is shown in Figure 5-5, with the full analysis provided in Appendix B.

Figure 5-5: Cycling Level of Service audit results



- 5.30 A summary of the key findings along the key routes of the A507, B656, High Street and Works Road are provided in the figures below. More detail on these links and other links are provided in Appendix B.

Figure 5-6: A507 key observations



Figure 5-7: B656 key observations

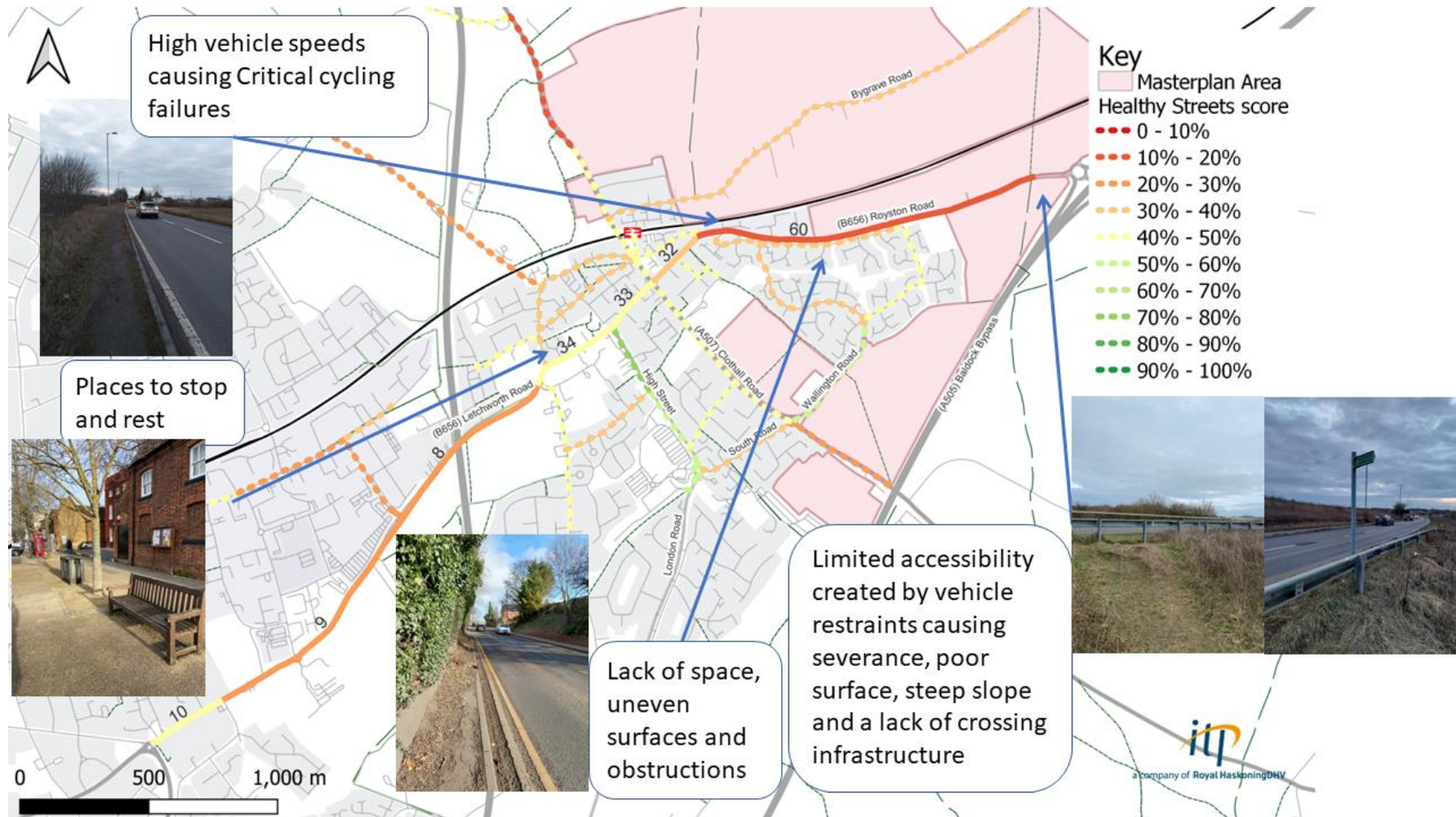


Figure 5-8: High Street key observations



Figure 5-9: Works Road key observations



**Link 17 was audited using the off-road variation of the walking framework; the score presented in the figure above is not healthy streets result*

5.31 Review of the findings generally indicate that there is:

- Significant potential to make movements easier for cyclists on all links due to the significant lack of on street cycle infrastructure.
- Generally a high standard of bus stop infrastructure, but there are specific locations where the good level of provision is not upheld
- A number of the off-road routes are let down by the severance impact of key roads and surface quality
- A general lack of cycle parking beyond the High Street
- High volumes and speeds of traffic on certain routes, including the prevalence of HGVs
- A number of constrained footway space, limiting the attractiveness and ease of use of such routes

5.32 The findings from this Accessibility Audit will be used, in conjunction with baseline understanding from other workstreams such as the collision analysis, to inform opportunities and constraints mapping and ultimately the Active and Sustainable Modes Strategy.

6. Mobility Vision and Key Objectives

- 6.1 Combining the key themes and aims of the local policy context (set out in Section 2) and potential for wider off-site transport interventions, a Mobility Vision has been established. This reflects the need to deliver growth differently, guided by a clear vision, and in a way that embeds active and sustainable travel first while being place, and masterplan led.
- 6.2 The Mobility Vision and Key Principles set out above will continue to be refined as the work progresses. The overarching Mobility Vision is set out below.

The Baldock Sustainable Extension will be a high quality, connected place, designed for people over cars, through actively prioritising walking, cycling and public transport within the site. Connections by these modes to Baldock will be enhanced, benefitting existing communities and businesses in the town. The design of the development, the mix of uses and the new infrastructure provided will reduce the need to travel, providing clear opportunities to make sustainable modes the first choice when travel is required.

- 6.3 The vision is supported by key masterplan objectives, which are:
- **Reducing traffic dominance in Baldock** will be important to encouraging modal shift and will be achieved through the masterplan proposals and off-site improvements; the development will lead the way in prioritising active and sustainable modes of travel thereby contributing to traffic reduction within the town.
 - **Safe, direct and coherent networks for active modes** will be prioritised on-site and will connect new and existing residents to employment, education, retail and leisure facilities by opening up more direct routes for walking, cycling and e-mobility, supported by mobility hubs, and helping reduce severance of existing infrastructure, including the Hitchin – Cambridge rail line, A1(M) and B656.

- **The green infrastructure network** will incorporate and enhance existing walking, cycling and equestrian access, encouraging leisure journeys and connecting to the existing rights of way and greenway network.
 - **Prioritising buses above private vehicles** will be achieved by providing routes into the site that maximise catchment, enhancing connectivity for new and existing residents and visitors. New high quality and accessible bus stops and bus priority infrastructure will be delivered to promote public transport as an attractive option, connecting Baldock to key destinations.
 - **Excellent rail access** with better facilities and access, will support sustainable travel to wider destinations. These will be delivered alongside enhanced pedestrian and cycling connections to the station, particularly to the north of the rail line, ensuring the first stage of rail trips are made mostly by foot or bike.
 - **Managing freight and logistics** within the site through the careful consideration of access, parking, loading bays and integration of mobility hubs will allow for efficient delivery of goods, as well as access by service and emergency vehicles.
 - **Reducing reliance on the private car** by positively managing vehicle access, according to the LTP4 modal hierarchy, and applying progressive parking standards will ensure that trips within the site are easier to make on foot, by bike or by public transport. Parking levels will be carefully considered to ensure a balance between under and over provision is reached, with parking levels related to connectivity and with charging facilities in safe, accessible and convenient locations.
- 6.4 The vision and objectives will inform the identification of interventions within the development area, off-site options and subsequently the development of a masterplan.

7. Implications for Strategic Masterplan

- 7.1 This section sets out the potential implications of these key principles and initial thinking on what they may mean for the strategic masterplan (SMP). This will be developed through the ITA.
- A wider strategic approach to managing traffic within Baldock, looking beyond the site boundary, has the potential to remove significant volumes of through traffic through Baldock, improving the sense of place in the town and conditions for pedestrians and cyclists
 - Significant improvements to connections to Baldock town centre and railway station for walking, cycling and public transport will be critical to reducing car trips from the site, as well as delivering potential mode shift benefits for existing communities
 - As well as utility trips, there is a need to connect the site into the PROW network, providing for access to the countryside and leisure trips, and providing opportunities to bring the countryside into the site
 - The modal hierarchy should be in line with LTP4 and prioritise walking, cycling and public transport first and this should be embedded in the masterplan, with these networks designed first
 - Some reductions in existing on-street parking may be required to facilitate improvements to cycle and bus priority within Baldock
 - Improvements delivered as part of the development, and wider town / region transport improvements could reduce the need to travel by car.

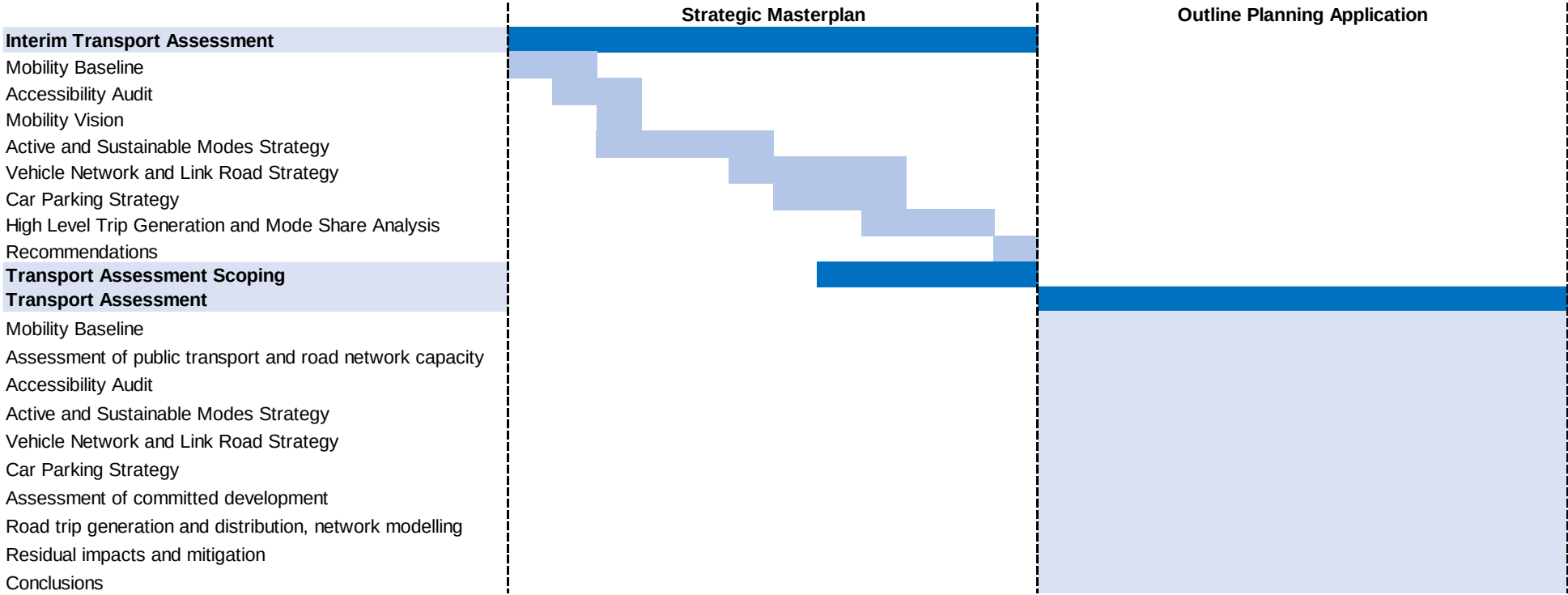
8. Conclusions and Next Steps

- 8.1 This Transport and Movement Baseline report has set out a detailed overview of baseline conditions within and around Baldock, including existing movement patterns and auditing key streets and PROW. The work has developed an interim Mobility Vision and set of supporting objectives.
- 8.2 A suite of interlinked strategies will be developed to ensure the delivery of this vision. These will consider different elements in more detail, but not be developed in isolation; they will link with wider strategies such as green spaces. These will cover:
- Active travel – focusing on walking and cycling networks, including e-scooters,
 - Sustainable travel – focusing on shared transport modes including bus, rail and shared vehicles / car clubs
 - Parking – including car parking, micro-mobility hire and parking and car clubs
 - Vehicle network and link road
- 8.3 These strategies will be developed in more detail as part of the ITA, developed from a clear statement of opportunities and constraints that will flow from the analysis forming this baseline report and will be the first stage of the ITA. Consistent with modal hierarchy enshrined in HCC's LTP4, the first strategy to be developed will be the active and sustainable modes strategy. This will be discussed with HCC and NHDC before developing the vehicle and link road strategy.

Next steps

- 8.4 A proposed methodology for the ITA has been developed and introduced to HCC and NHDC. Once agreed this will set the scope for the next stages of work, which will lead to the agreement of a preferred strategic masterplan option. It is anticipated that a Transport Assessment Scoping exercise will have been completed by the time the Interim Transport Assessment is concluded, which will allow the quick development of a full Transport Assessment to support the Outline Planning Application. The Transport Assessment will then test the preferred masterplan option.

Figure 8-1: Next steps



Appendix A

Baldock Survey Data Analysis – Technical Note

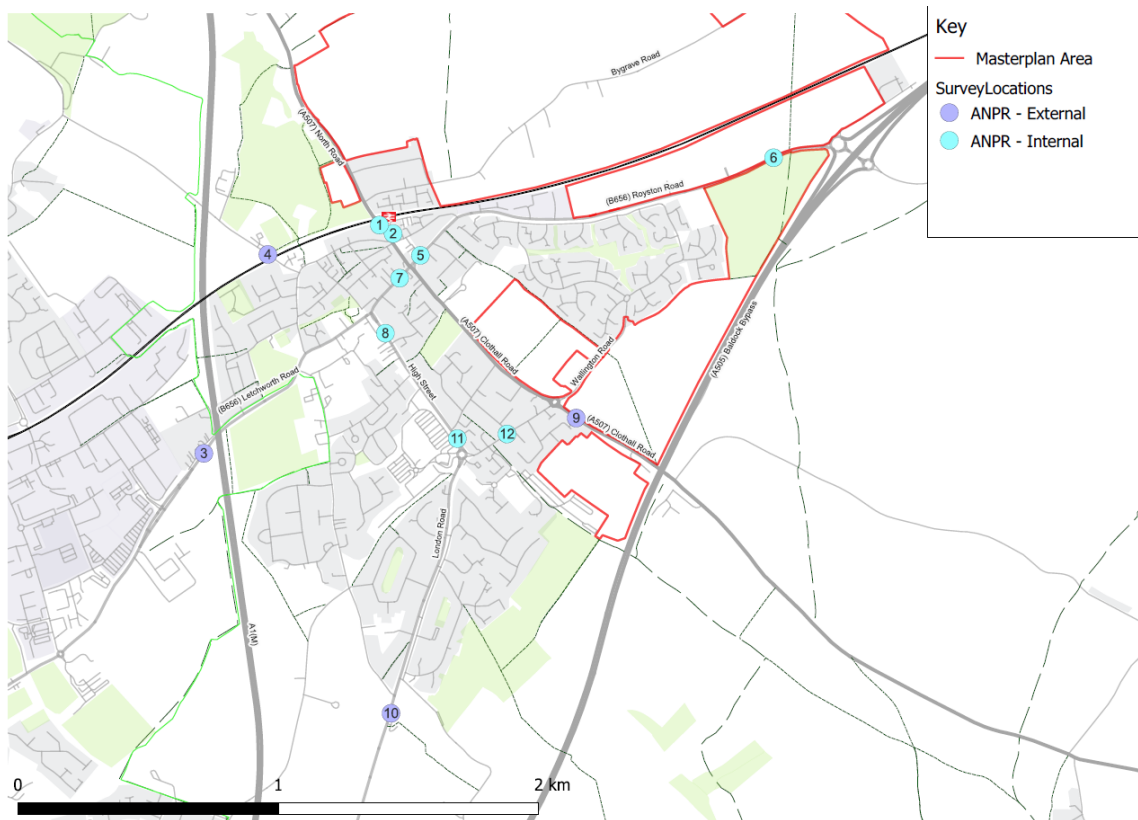
Title	Baldock Transport Survey Data Analysis
Date	23/02/2023
Author(s)	JP, BS, TMF, GB
Project Code	3712
Version	2



1. ANPR movement analysis

- 1.1 An Automatic Number Plate Recognition (ANPR) cordon survey was undertaken to allow a more detailed understanding of traffic movements across the town. The location of the cordon cameras for Baldock are shown in Figure 1-1. The ANPR cameras recorded the vehicle class and direction of travel for each camera, as well as the point and time the vehicle entered and left the cordon.
- 1.2 ANPR sites are either assumed to be 'External' or 'Internal'. This affects the way in which the origin-destination matching process works in relation to each site. The differences between the two types are as follows:
 - External - these are sites which are assumed to be on the periphery of the study area and hence vehicles passing through these sites will be starting or ending their trip. Directions at these sites are set to Inbound and Outbound, and for sites that have vehicles travelling into the study area (i.e. they are not purely a one-way Outbound site).
 - Internal - these are sites that are considered to be possible through movement sites for longer distance origin-destination movements - i.e. they may be an intermediate capture point for vehicles seen entering and exiting the study area elsewhere. In this instance, the origin-destination movement is assigned to the initial and final capture locations. Internal sites can be the origin of a trip (if it is not captured elsewhere before) or the destination of a trip (if it is not captured again after).
- 1.3 This allows an analysis to be undertaken of traffic movements through the town, as well as information such as HGV volumes and movements and proportion of through traffic.

Figure 1-1: ANPR cordon camera locations



Weekday AM + PM cumulative ANPR movements

Two-way

1.4 Figure 1-2 below shows the aggregated total flow from the AM and PM peak periods between 07:00 – 10:00 and 16:00 – 19:00 – all motorised vehicles. The 'top five' two-way movements are (blue arrows in diagram):

- 1219 trips between North Road (1) and Clothall Road (9) – 9% of all trips
- 907 trips between North Road (1) and Royston Road (6) – 7% of all trips
- 830 trips between Letchworth Road (3) and Royston Road (6) – 6% of all trips
- 763 trips between Clothall Road (9) and London Road (10) – 6% of all trips
- 568 trips between Letchworth Road (3) and Clothall Road (9) – 4% of all trips

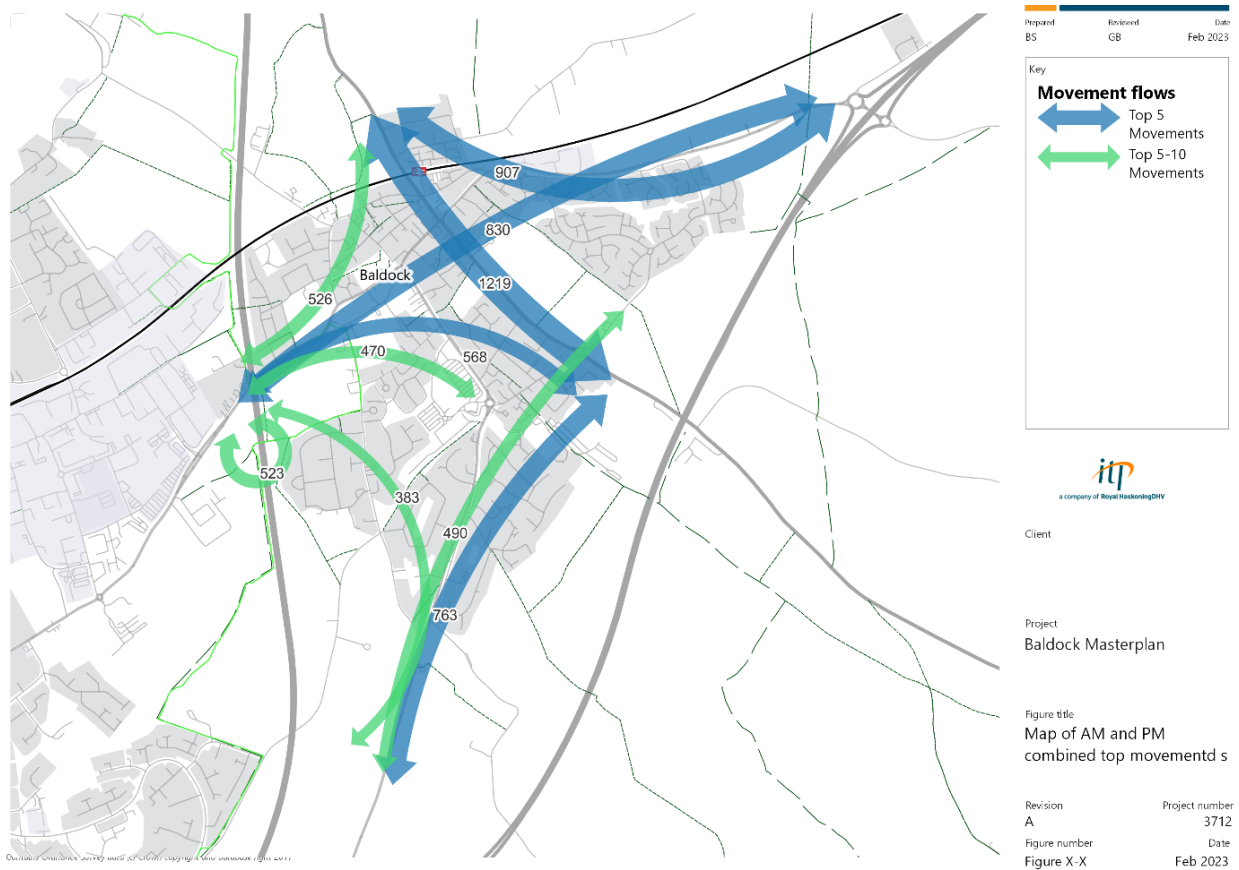
1.5 These represent a total of 33% of all trips. The remaining 'top ten' two-way movements (green arrows in diagram):

- 526 trips between North Road (1) and Letchworth Road (3) – 4% of all trips
- 523 trips between Letchworth Road (3) and Letchworth Road (3) – 4% of all trips
- 490 trips between London Road (10) and Wallington Road (12) – 4% of all trips

- 470 trips between Letchworth Road (3) and High Street (11) – 4% of all trips
- 383 trips between Letchworth Road (3) and London Road (10) – 3% of all trips

1.6 The top ten movements represent 52% of all trips.

Figure 1-2: Aggregated AM and PM weekday movements



Uni-Directional

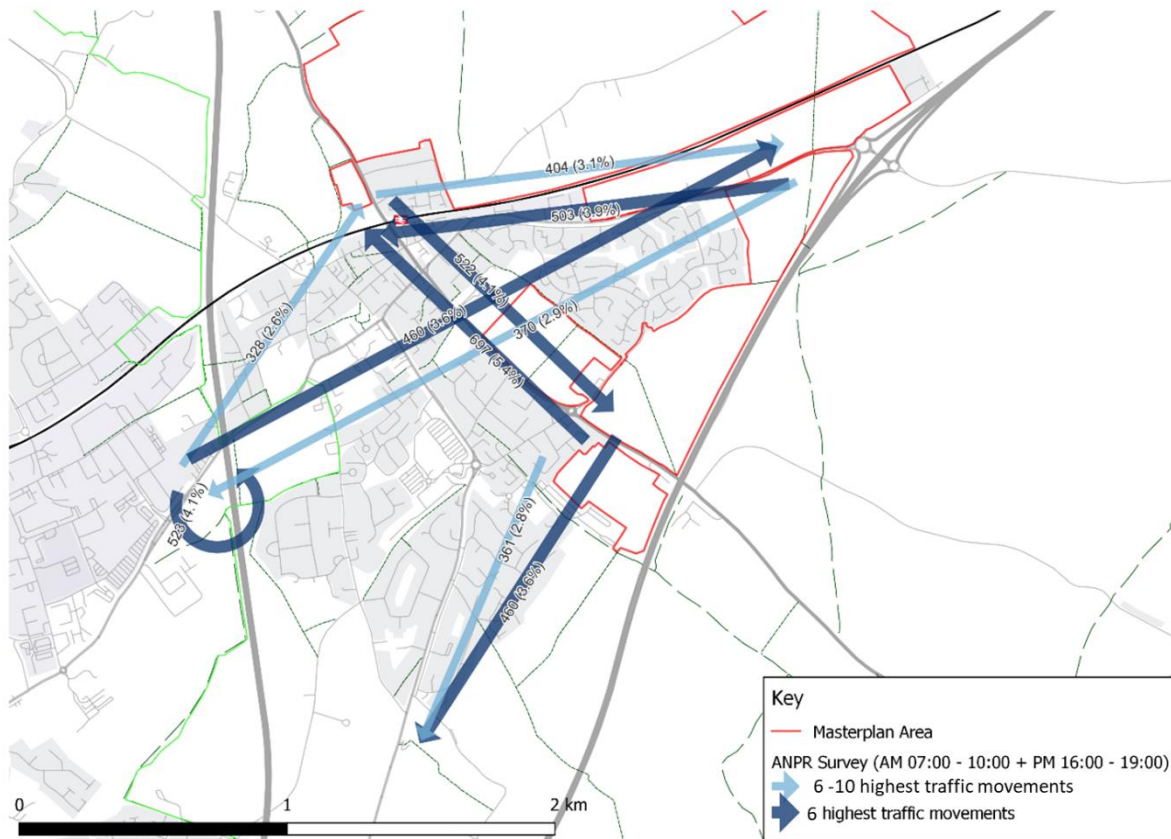
1.7 Figure 1-3 breaks the aggregated traffic flows (AM + PM peak) down by direction. The top 10 movements are shown, along with the total vehicles recorded on that movement and the proportion of total movements this represents. In this diagram the top six movements are shown in dark blue as two movements have an equal number of movements recorded.

1.8 The 'top six' one-way movements are (dark blue arrows in diagram):

- 697 trips travelling from Clothall Road (9) to North Road (1) – 5% of AM and PM trips
- 523 trips travelling to and from Letchworth Road (3) – 4% of AM and PM trips
- 522 trips travelling from North Road (1) to Clothall Road (9) – 4% of AM and PM trips
- 199 trips travelling from Royston Road (6) to North Road (1) – 4% of AM and PM trips
- 460 trips travelling from Letchworth Road (3) to Royston Road (6) – 4% of AM and PM trips

- 460 trips travelling from Clothall Road (9) to London Road (10) – 4% of AM and PM trips

Figure 1-3: Aggregated AM and PM weekday movements (by direction)



Weekday AM Peak movements

Two-way

- 1.9 Figure 1-4 below shows the weekday AM (07:00-10:00) peak movements – all motorised vehicles. To help identify any tidal differences between AM and PM peaks, the blue arrows represent movements with broadly equal directional flow and are as follows:

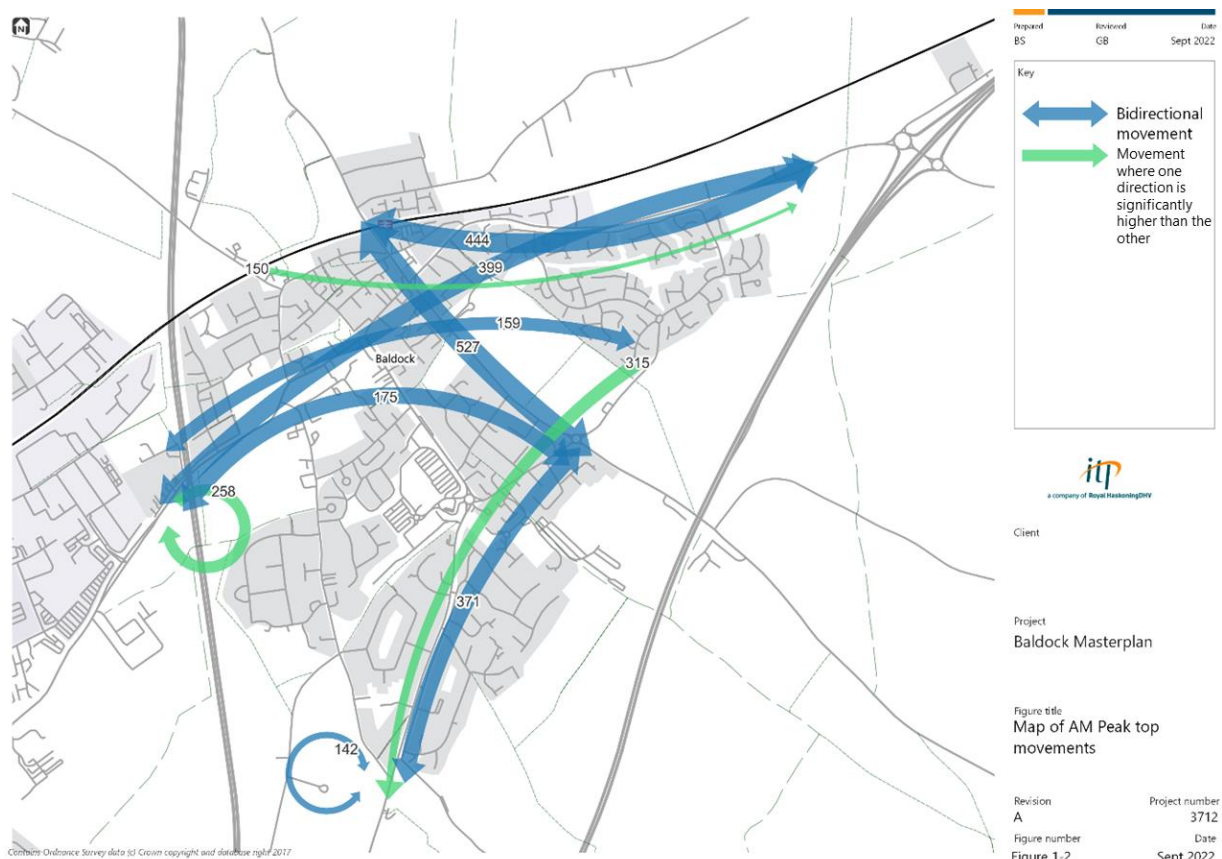
- 527 trips between North Road (1) and Clothall Road (9) – 9% of AM trips
- 444 trips between North Road (1) and Royston Road (6) – 7% of AM trips
- 399 trips between Letchworth Road (3) and Royston Road (6) – 7% of AM trips
- 371 trips between Clothall road (9) and London Road (10) – 6% of AM trips
- 286 trips between Letchworth Road (3) and Clothall Road (9) – 5% of AM trips
- 258 trips between Letchworth Road (3) and Letchworth Road (3) – 4% of AM trips
- 159 trips between Letchworth Road (3) and Wallington Road (12) – 3% of AM trips
- 142 trips between London Road (10) and London Road (10) – 2% of AM trips

1.10 The green arrows represent movements where more than two thirds of trips are in one direction for a singular movement and are as follows:

- 315 trips between Wallington Road (12) and London Road (10) – 5% of AM trips
- 150 trips between Norton Road (4) and Royston Road (6) – 2% of AM trips

1.11 The top five trips represent 34% of total movements and the top ten trips represent 50% of total movements.

Figure 1-4: Total AM weekday movements



Uni-Directional

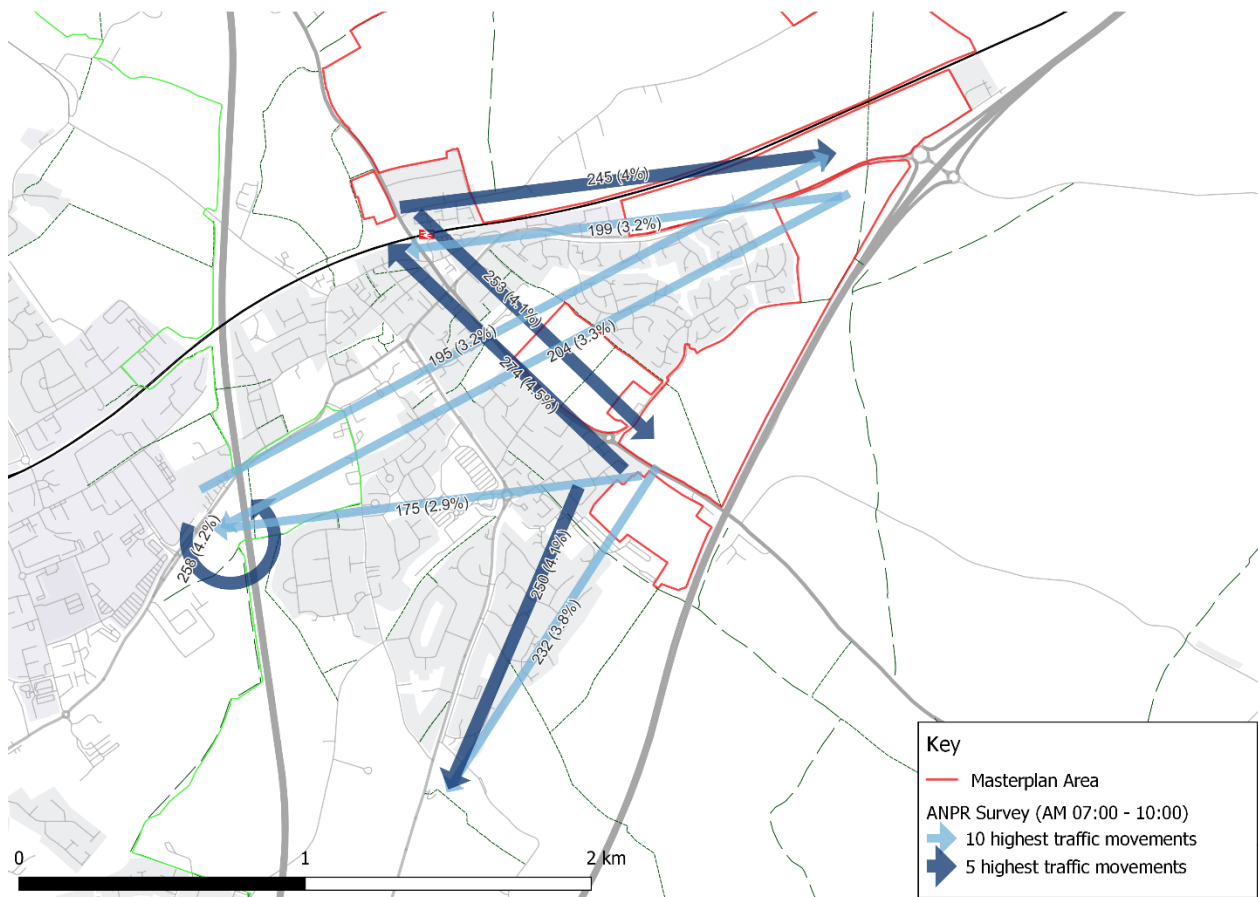
1.12 Figure 1-5 breaks the AM peak period traffic flows down by direction. The top 10 movements are shown, along with the total vehicles recorded on that movement and the proportion of total movements this represents.

1.13 The 'top five' one-way movements are (dark blue arrows in diagram):

- 274 trips travelling from Clothall Road (9) to North Road (1) – 5% of AM trips
- 258 trips travelling from and to Letchworth Road (3) – 4% of AM trips
- 253 trips travelling from North Road (1) to Clothall Road (9) – 4% of AM trips
- 250 trips travelling from Wallington Road (12) to London Road (10) – 4% of AM trips

- 245 trips travelling from North Road (1) to Royston Road (6) – 4% of AM trips

Figure 1-5: Total AM weekday movements (by direction)



Weekday PM peak Movements

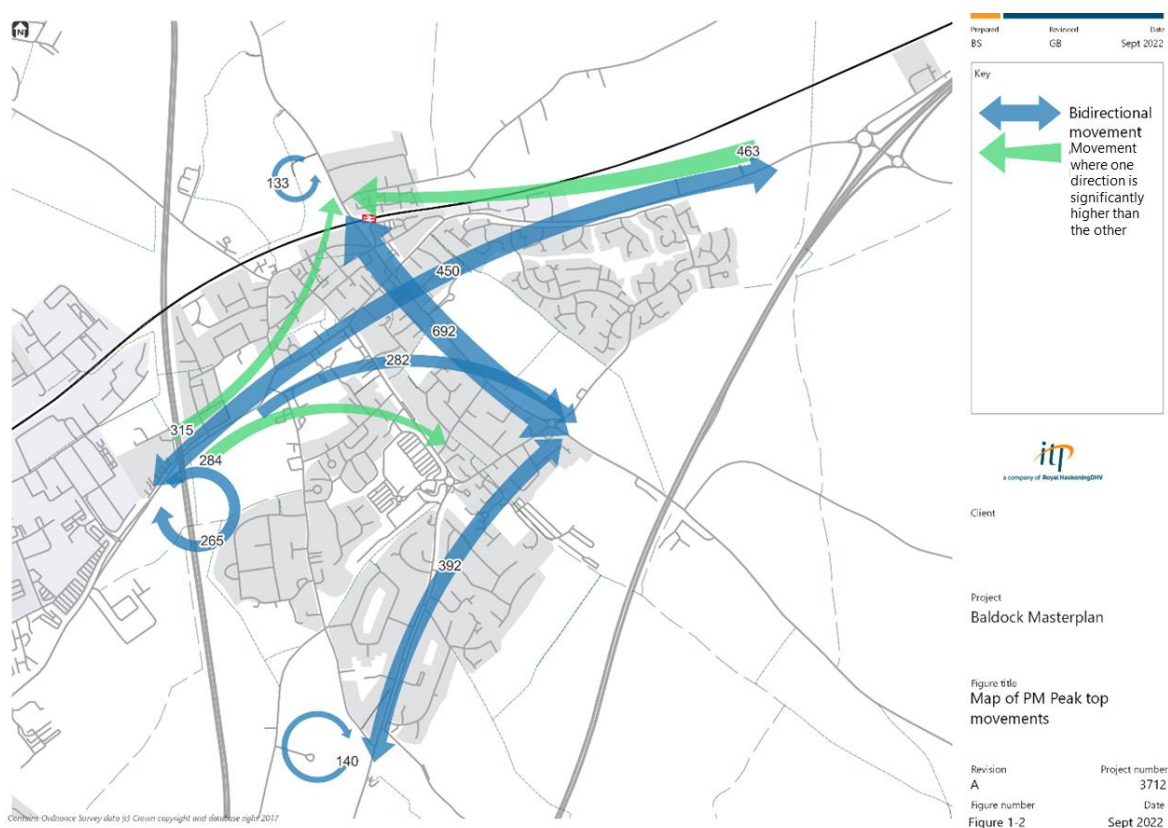
Two-way

1.14 Figure 1-6 below shows the weekday PM (16:00-19:00) peak movements – all motorised vehicles. As above, the movement have been split, reflecting any tidal characteristics. The blue arrows represent movements with equal directional flow and are as follows:

- 692 trips between North Road (1) and Clothall Road (9) – 10% of PM trips
- 450 trips between Letchworth Road (3) and Royston Road (6) – 7% of PM trips
- 392 trips between Clothall Road (9) and London Road (10) – 6% of PM trips
- 282 trips between Letchworth Road (3) and Clothall Road (9) – 4% of PM trips
- 265 trips between Letchworth Road (3) and Letchworth Road (3) – 4% of PM trips
- 140 trips between London Road (10) and London Road (10) – 2% of PM trips

- 133 trips between North Road (1) and North Road (1) – 2% of PM trips
- 1.15 The green arrows represent movements where more than two thirds of trips are in one direction for a singular movement and are as follows:
- 463 trips between Royston Road (6) and North Road (1) - 7% of PM trips
 - 315 trips between Letchworth Road (3) and North Road (1) – 5% of PM trips
 - 284 trips between Letchworth Road (3) and High Street (11) – 4% of PM trips
- 1.16 The top five trips represent 34% of total movements and the top ten trips represent 51% of total movements.

Figure 1-6: Total PM weekday movements

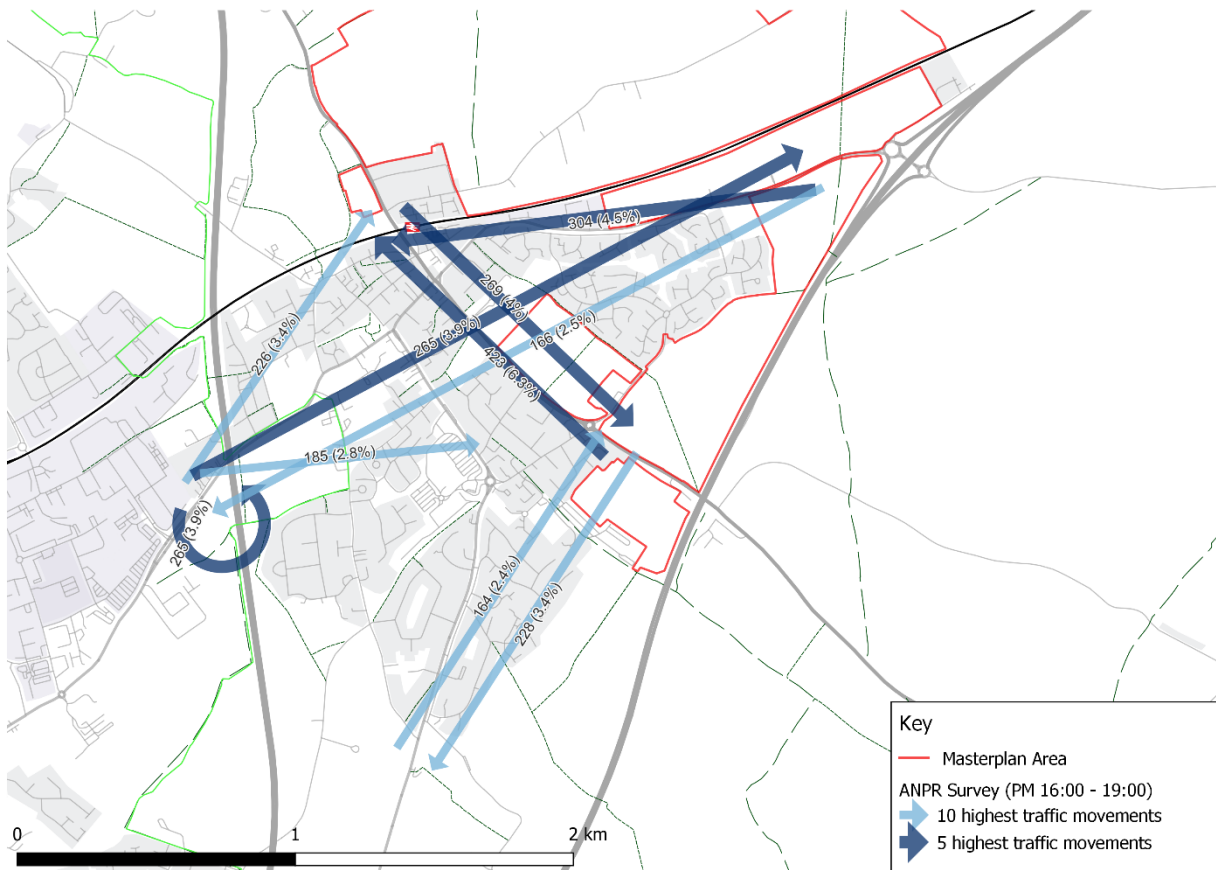


Uni-Directional

- 1.17 Figure 1-7 breaks the PM peak period traffic flows down by direction. The top 10 movements are shown, along with the total vehicles recorded on that movement and the proportion of total movements this represents.
- 1.18 The 'top five' one-way movements are (dark blue arrows in diagram):
- 423 trips travelling from Clothall Road (9) to North Road (1) – 6% of PM trips
 - 304 trips travelling from Royston Road (6) to North Road (1) – 5% of PM trips
 - 269 trips travelling from North Road (1) to Clothall Road (9) – 4% of PM trips

- 265 trips travelling from and to Letchworth Road (3) – 4% of PM trips
- 265 trips travelling from Letchworth Road (3) to Royston Road (6) – 4% of PM trips

Figure 1-7: Total PM weekday movements (by direction)



Weekend Peak Movements

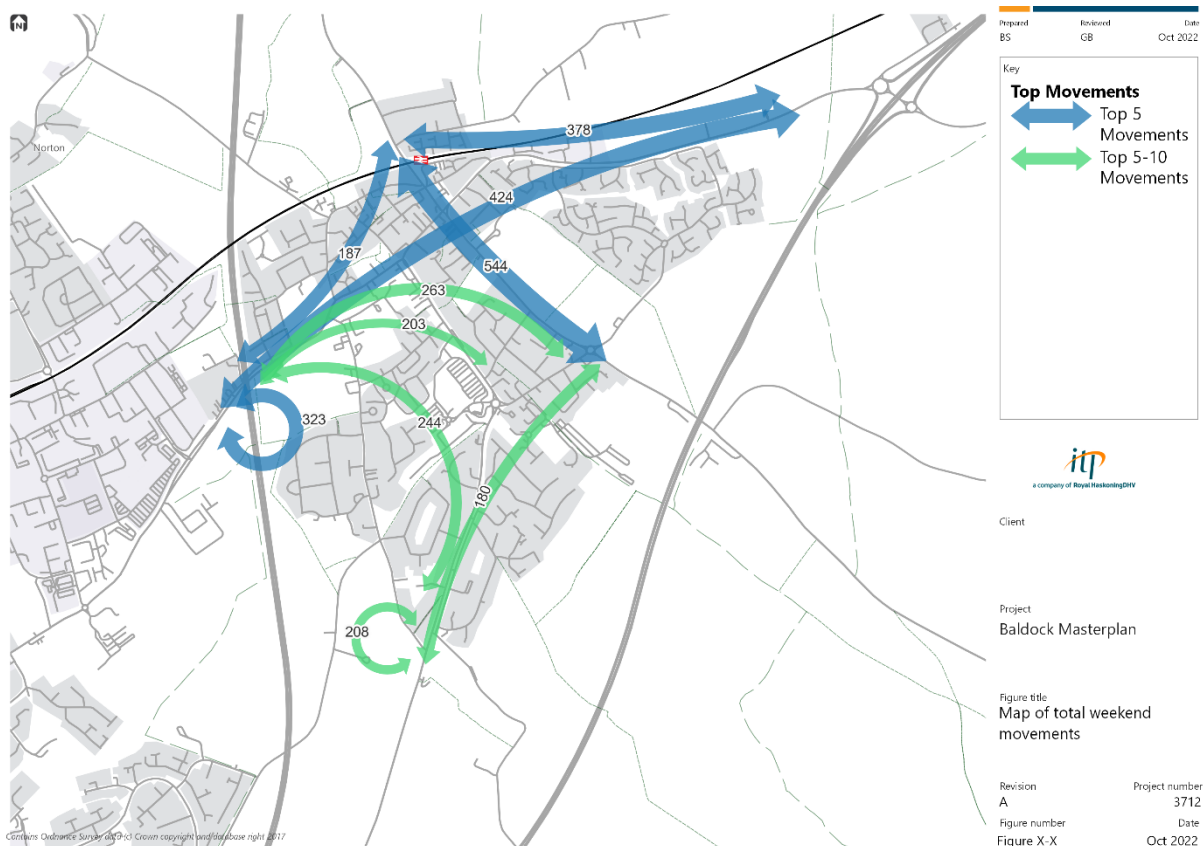
1.19 Figure 1-8 below shows the weekend peak (11:00-14:00) peak movements – all motorised vehicles. The top ten movements all had similar flows in each direction. The Blue arrows are as follows:

- 544 trips between North Road (1) and Clothall Road (9) – 9% of trips
- 424 trips between Letchworth Road (3) and Royston Road (6) – 7% of trips
- 378 trips between North Road (1) and Royston Road (6) – 6% of trips
- 323 trips between Letchworth Road (3) and Letchworth Road (3) – 5% of trips
- 322 trips between Clothall Road (9) and London Road (10) – 5% of trips
- 312 trips between Letchworth Road (3) and North Road (1) – 5 % of trips

- 263 trips between Letchworth Road (3) and Clothall Road (9) – 4% of trips
- 244 trips between Letchworth Road (3) and London Road (10) – 4% of trips
- 208 trips between London Road (10) and London Road (10) – 3% of trips
- 203 trips between Letchworth Road (3) and High Street (11) – 3% of trips

1.20 The top five trips represent 31% of total movements and the top ten trips represent 51% of total movements.

Figure 1-8: Map of total weekend movements

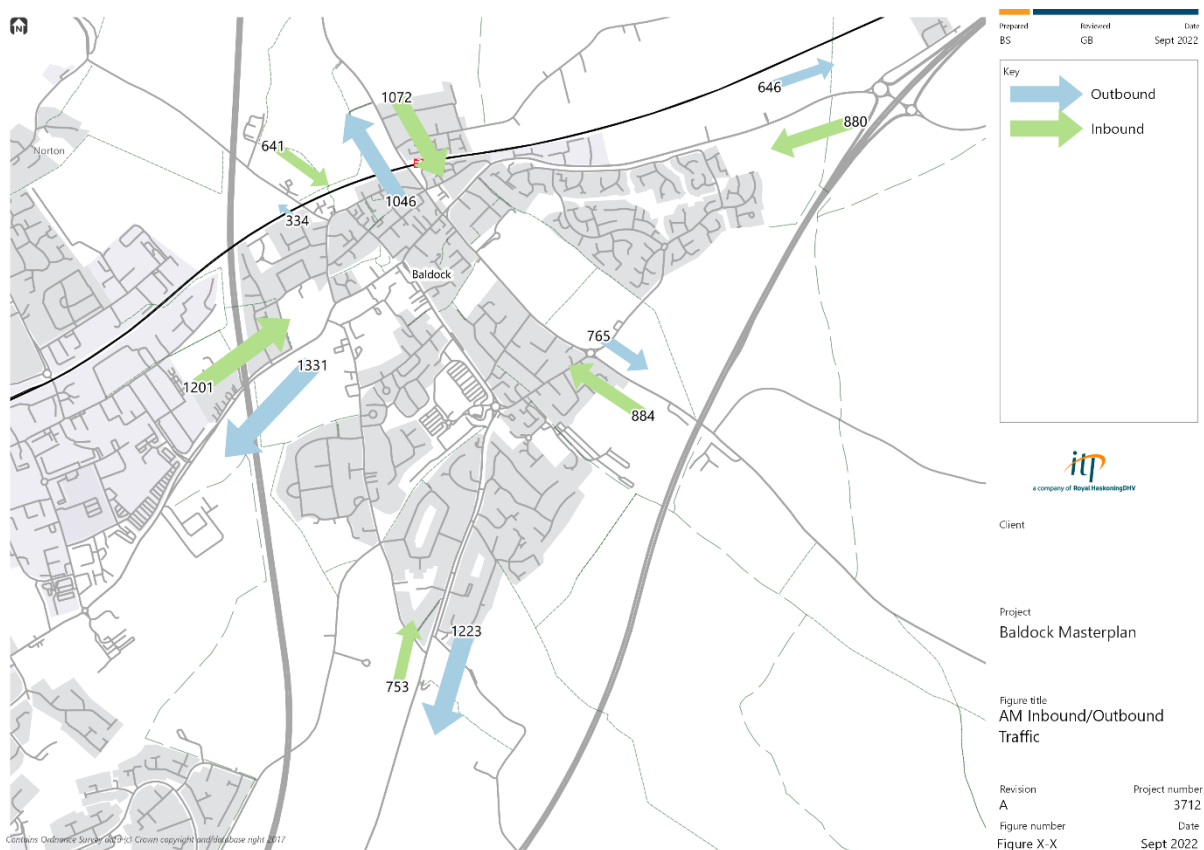


Direction of travel

AM peak

1.21 The AM inbound/outbound all mode traffic flows are broadly evenly matched for each entry/exit camera, with two exceptions. Camera ten (London Road) has significantly more outbound traffic in the AM whereas camera four (Norton Road) has significantly more inbound traffic in the AM.

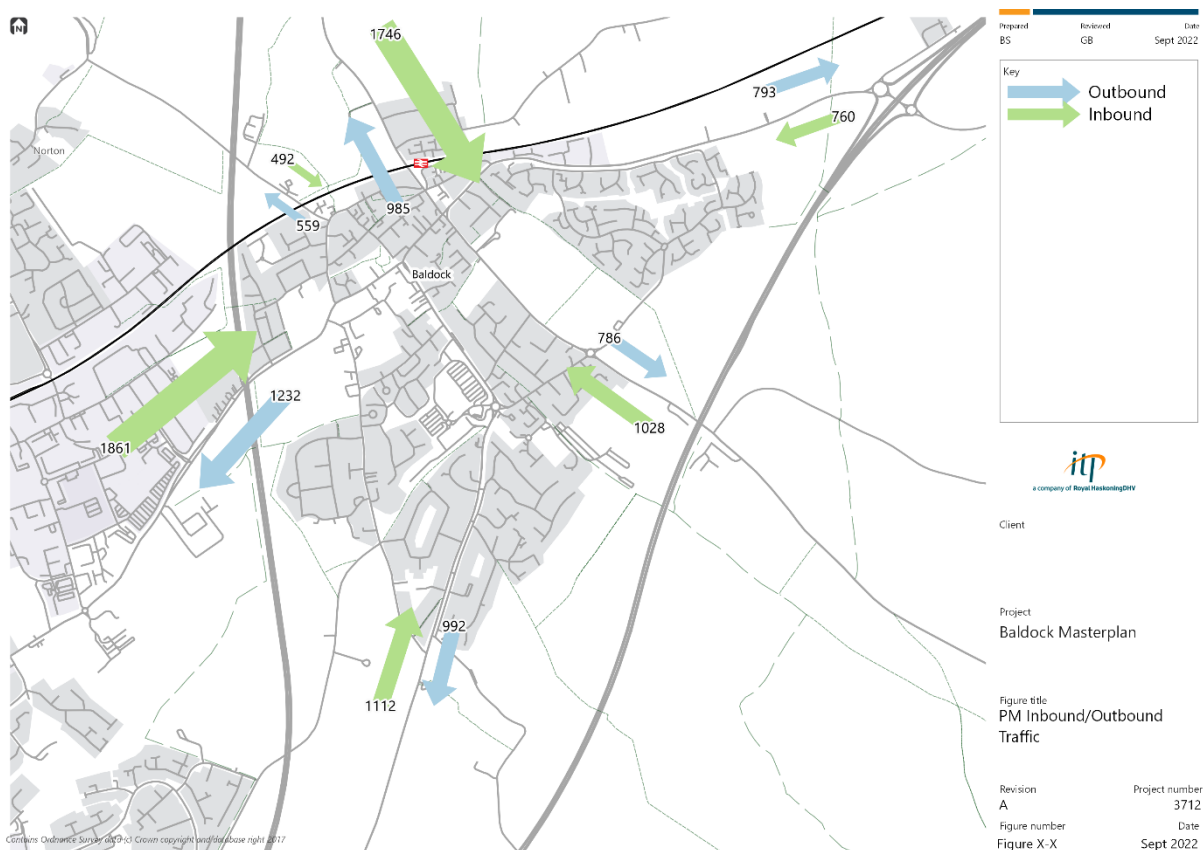
Figure 1-9: Map of AM Inbound vs Outbound traffic



PM peak

- 1.22 The PM total peak movements are much more varied. Camera one (North Road) has significantly more inbound trips than outbound as well as camera three (Letchworth Road). As well as this, camera ten (London Road) and nine (Clothall Road) show similar trends. In total there are more than 1,500 additional inbound trips than outbound which may represent people travelling home and not exiting the cordon again.

Figure 1-10: Map of PM Inbound vs Outbound traffic



Destinations within the cordon

- 1.23 An analysis has been undertaken of movement patterns within the cordon with a particular focus on identifying the main destinations people travel to within the cordon, and where from. The internal cameras are locations 2, 5, 7, 8, 11 and 12 in Figure 1-1.
- 1.24 Movements ending at internal cameras represent 1,074 trips in the AM peak, which is 18% of all moments within the ANPR cordon. In the PM peak this figure is 1,261, which is 19% of all movements.
- 1.25 In both the AM and PM peaks the most popular destination within the cordon are to camera 11, which is on the High Street towards the junction with Tesco. In the AM this represents 5% of all trips and 30% of all internal trips, with the corresponding figures being 7% and 38% in the PM peak. These are likely to be trips made to Tesco predominately, as well as to the High Street. In both the AM and PM peak the most popular origin for these trips is from Letchworth Road (26% and 38% respectively).
- 1.26 In the AM peak the next most popular destination is camera 12 (South Road), representing 26% of internal trips and 4% of all trips. It should be noted that trips 'ending' at camera 12 could be accessing a range of commercial and residential destinations including the areas around London Road, including Tesco, Clothall Common and Clothall Road. The most

popular origin for these trips is London Road (24%), followed by South Road itself (18%), Clothall Road (16%) and Letchworth Road (16%). The high proportion of trips only passing the South Road camera suggest a number of very local trips being made by car.

- 1.27 In the AM peak another popular destination is camera 8 (High Street north), representing 22% of internal trips and 4% of all trips. The most popular origin for these trips is Letchworth Road (19%), followed by London Road (12%), Norton Road (11%) and North Road (11%).
- 1.28 In the PM peak the next most popular destination after the High Street (Tesco end) is camera 8 (High Street north), representing 24% of internal trips and 5% of all trips. The most popular origin for these trips is Letchworth Road (28%), followed by London Road (18%), Norton Road (11%) and High Street (Tesco End) (10%). The proportion of trips only passing a High Street camera suggest a number of very local trips being made by car.
- 1.29 In the PM peak another popular destination is camera 12 (South Road), representing 20% of internal trips and 4% of all trips. As above, it should be noted that trips 'ending' at camera 12 could be accessing a range of commercial and residential destinations. The most popular origin for these trips is London Road (25%), followed by Clothall Road (23%) and Letchworth Road (21%).
- 1.30 Table 1-1 and Table 1-2 provide more detail regarding the data summarised above.

Table 1-1: Internal camera origin destination analysis AM peak

Destination	Camera 02		Camera 05		Camera 07		Camera 08		Camera 11		Camera 12	
Origin	Trips	%	Trips	%	Trips	%	Trips	%	Trips	%	Trips	%
Camera 01	8	30%	21	14%	15	21%	27	11%	21	7%	16	6%
Camera 02	4	15%	0	0%	0	0%	2	1%	0	0%	0	0%
Camera 03	1	4%	32	22%	11	15%	46	19%	83	26%	44	16%
Camera 04	2	7%	26	18%	2	3%	26	11%	45	14%	8	3%
Camera 05	0	0%	9	6%	1	1%	4	2%	3	1%	2	1%
Camera 06	1	4%	24	17%	20	28%	11	5%	6	2%	8	3%
Camera 07	1	4%	4	3%	5	7%	7	3%	2	1%	3	1%
Camera 08	1	4%	5	3%	1	1%	22	9%	40	13%	20	7%
Camera 09	5	19%	12	8%	2	3%	17	7%	18	6%	44	16%
Camera 10	0	0%	6	4%	5	7%	29	12%	40	13%	65	24%
Camera 11	3	11%	5	3%	3	4%	20	8%	34	11%	13	5%
Camera 12	1	4%	1	1%	5	7%	23	10%	24	8%	50	18%
Camera 13	0	0%	0	0%	2	3%	2	1%	0	0%	1	0%
Camera 14	0	0%	0	0%	0	0%	1	0%	3	1%	0	0%
Total trips	27	100%	145	100%	72	100%	237	100%	319	100%	274	100%
% of internal trips	3%	-	14%	-	7%	-	22%	-	30%	-	26%	-
% of all trips	0%	-	2%	-	1%	-	4%	-	5%	-	4%	-

Table 1-2: Internal camera origin destination analysis PM peak

Destination	Camera 02		Camera 05		Camera 07		Camera 08		Camera 11		Camera 12	
Origin	Trips	%	Trips	%	Trips	%	Trips	%	Trips	%	Trips	%
Camera 01	4	40%	7	6%	20	20%	34	11%	37	8%	10	4%
Camera 02	1	10%	0	0%	0	0%	1	0%	3	1%	1	0%
Camera 03	2	20%	14	13%	21	21%	86	28%	185	38%	53	21%
Camera 04	0	0%	1	1%	5	5%	18	6%	42	9%	7	3%
Camera 05	0	0%	15	14%	3	3%	3	1%	2	0%	1	0%
Camera 06	1	10%	51	47%	28	28%	18	6%	13	3%	13	5%
Camera 07	0	0%	4	4%	4	4%	5	2%	3	1%	4	2%
Camera 08	0	0%	3	3%	1	1%	16	5%	51	11%	13	5%
Camera 09	0	0%	4	4%	0	0%	26	8%	11	2%	58	23%
Camera 10	2	20%	5	5%	10	10%	55	18%	65	13%	64	25%
Camera 11	0	0%	2	2%	3	3%	31	10%	41	8%	12	5%
Camera 12	0	0%	3	3%	3	3%	11	4%	29	6%	16	6%
Camera 13	0	0%	0	0%	1	1%	2	1%	1	0%	1	0%
Camera 14	0	0%	0	0%	0	0%	1	0%	0	0%	0	0%
Total trips	10	100%	109	100%	99	100%	307	100%	483	100%	253	100%
% of internal trips	1%	-	9%	-	8%	-	24%	-	38%	-	20%	-
% of all trips	0%	-	2%	-	1%	-	5%	-	7%	-	4%	-

HGV movements

HGV AM peak movements

1.31 Figure 1-11 below shows the weekday AM (07:00-10:00) peak movements – all Heavy Goods Vehicles > 3.5T. The blue arrows represent the top five movements and are as follows:

- 29 trips between North Road (1) and Clothall Road (9)
 - 12% of HGV AM trips
 - 3% of total trips from North Road to Clothall Road
 - 8% of total trips from Clothall Road to North Road
- 22 trips between North Road (1) and Royston Road (6)
 - 9% of HGV AM trips
 - 4% of total trips from North Road to Royston Road
 - 7% of total trips from Royston Road to North Road
- 20 trips between Letchworth Road (3) and Royston Road (6)
 - 9% of HGV AM trips
 - 4% of total trips from Letchworth Road to Royston Road
 - 6% of total trips from Royston Road to Letchworth Road
- 19 trips between Clothall Road (9) and London Road (10)
 - 9% of AM trips
 - 3% of total trips from Clothall Road to London Road
 - 9% of total trips from London Road to Clothall Road
- 17 trips between Letchworth Road (3) and North Road (1)
 - 7% of HGV AM trips
 - 9% of total trips from Letchworth Road to North Road
 - 7% of total trips from North Road to Letchworth Road

1.32 The remaining 'top ten' two-way movements (green arrows in diagram):

- 12 trips between Letchworth Road (3) and Clothall Road (9)
 - 5% of HGV AM trips
 - 4% of total trips from Letchworth Road to Clothall Road
 - 5% of total trips from Clothall Road to Letchworth Road
- 11 trips between Wallington Road (12) and London Road (10)

- 5% of HGV AM trips
- 1% of total trips from Wallington Road to London Road
- 14% of total trips from London Road to Wallington Road
- Nine trips between North Road (1) and Royston Road (west) (5)
 - 4% of HGV AM trips
 - 14% of total trips from North Road and Royston Road (west)
 - 27% of total trips from Royston Road (west) to North Road
- Eight trips between Clothall Road (9) and South Road (12)
 - 3% of HGV AM trips
 - 16% of total trips from Clothall Road and South Road
 - 2% of total trips from South Road to Clothall Road
- Six trips between London Road (10) and London Road (10)
 - 3% of HGV AM trips
 - 4% of total trips from London Road to London Road

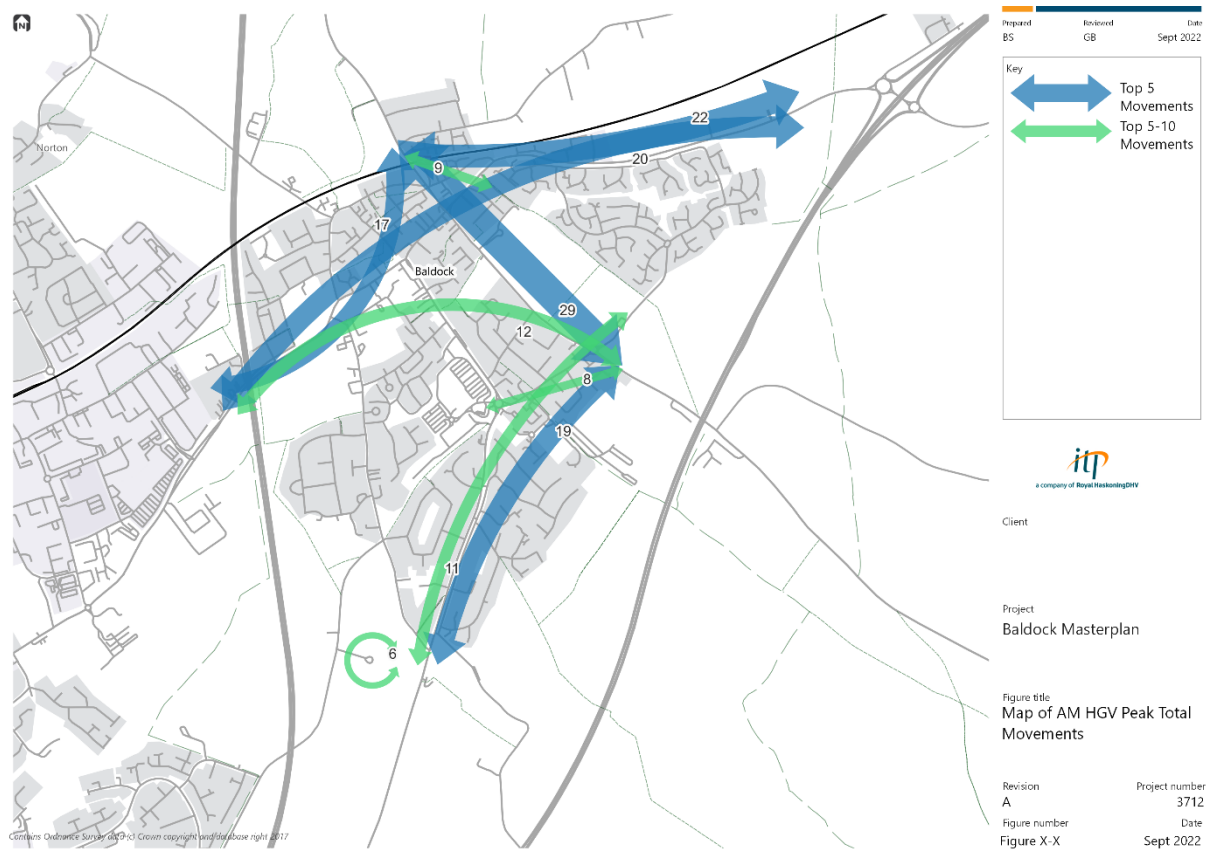
1.33 The top five trips represent 45% of total movements and the top ten trips represent 66% of total movements. The movements largely reflect the same pattern of all vehicles, however the movement from Clothall Road to South Road is new, likely representing HGV movements to Tesco, as well the movement from North Road to Royston Road (west), likely representing HGV movements to commercial premises at the western end of the road.

1.34 HGV movements represent 4% of all movements in the AM peak, although as can be seen above, for many movements, HGVs represent a higher proportion of total traffic. In the absence of cycle infrastructure proportions of HGV traffic greater than 5% will create a hostile environment for cyclists¹. Proportions of HGV traffic above this level are seen in many locations, with particular concern where traffic volumes are also high for example between Clothall Road and North Road, Royston Road to North Road, Royston Road to Letchworth Road and between Letchworth Road and North Road (both directions).

1.35 Trips shorter than 30 minutes represent 83% of all movements.

¹ Based on guidance provided in LTN 1/20

Figure 1-11: Map of AM HGV movements



HGV PM Peak movements

1.36 Figure 1-12 below shows the weekday PM (16:00-19:00) peak movements – all Heavy Goods Vehicles > 3.5T. The blue arrows represent the top five movements and are as follows:

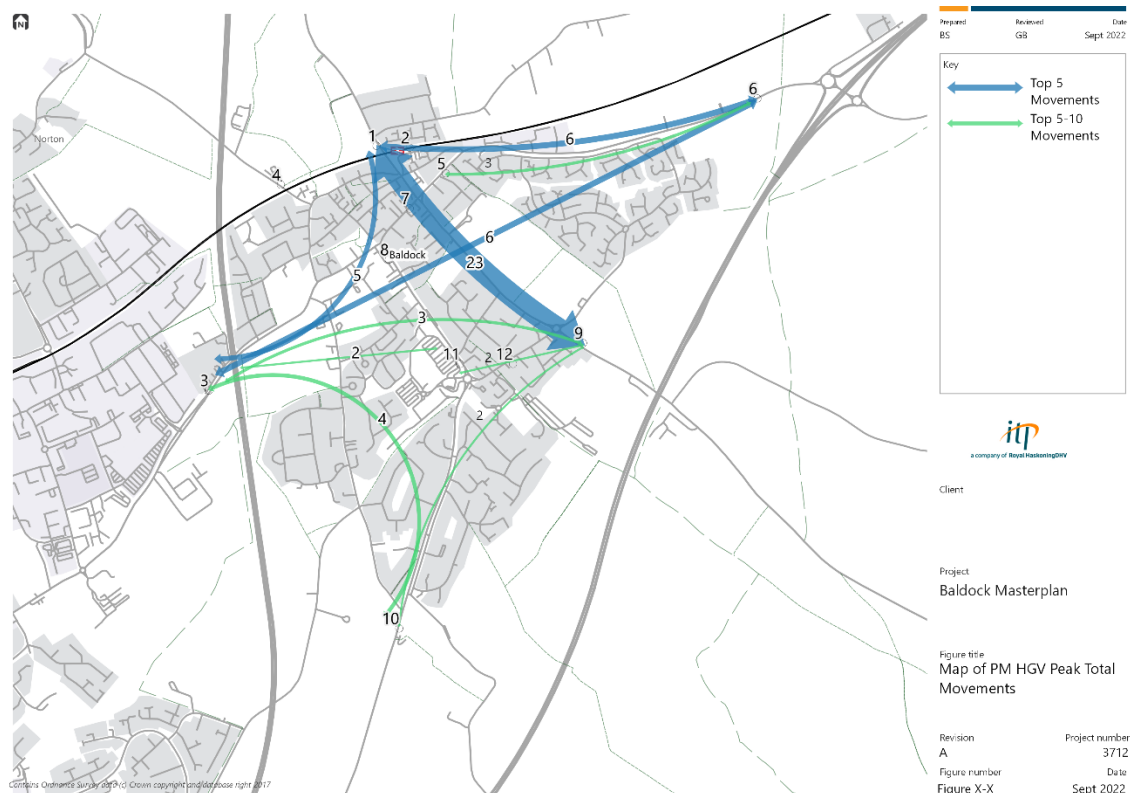
- 23 trips between North Road (1) and Clothall Road (9) – 29% of HGV PM trips
- 6 trips between North Road (1) and Royston Road (6) – 8% of HGV PM trips
- 6 trips between Letchworth Road (3) and Royston Road (6) – 8% of HGV PM trips
- 5 trips between Letchworth Road (3) and North Road (1) – 6% of HGV PM trips
- 4 trips between Letchworth Road (3) and London Road (10) – 5% of HGV PM trips

1.37 The remaining 'top ten' two-way movements (green arrows in diagram):

- 3 trips between Letchworth Road (3) and Clothall Road (9) – 4% of HGV PM trips
- 3 trips between Royston Road Short (5) and Royston Road (6) – 4% of HGV PM trips
- 2 trips between Clothall Road (9) and London Road (10) – 3% of HGV PM trips
- 2 trips between Letchworth Road (3) and Tesco (11) – 3% of HGV PM trips
- 2 trips between Clothall Road (9) and South Road (12) – 3% of HGV PM trips

1.38 The HGV movements in the PM peak are substantially different to the AM peak, and to the general traffic movements recorded. Overall volumes are substantially lower with only one notable movement being recorded, being the movement between Clothall Road and North Road. Trips shorter than 30 minutes represent 90% of all movements, suggesting most of the HGV movement are through movements. The data suggests that there is more servicing activity taking place within the town in the AM peak, as well as movement to surrounding areas.

Figure 1-12: Map of PM HGV movements



Through traffic

Methodology

- 1.39 The cameras used for the analysis of through traffic consist of the outlying perimeter cameras (C1, C3, C4, C6, C9, C10), as seen in Figure 1-1.
- 1.40 The first step was to calculate the transit times from each of the outlying cameras to another. This task used Google Maps to calculate these trips between cameras at peak hours in an AM and PM timetable (midweek). For the AM peak, the longest 'worst case' journey times were seen around 08:30. For the PM peak, the longest 'worst case' journey times were seen around 18:00. The maximum trip duration between cameras was then extracted to avoid having to analyse each individual route each vehicle took. The journey times are show in Table 1-3.

Table 1-3: Trip durations between cameras.

MAX 8:30AM time duration (min)	C1	C3	C4	C6	C9	C10	MAX
C1	0	6	3	6	4	8	8
C3	7	0	3	9	8	6	9
C4	2	3	0	7	6	9	9
C6	6	9	7	0	6	9	9
C9	3	7	6	6	0	3	7
C10	7	6	6	5	3	0	7
MAX 6:00PM time duration (min)	C1	C3	C4	C6	C9	C10	MAX
C1	0	6	2	4	6	7	7
C3	4	0	3	8	7	4	8
C4	2	2	0	6	6	4	6
C6	4	7	6	0	6	9	9
C9	3	6	6	6	0	3	6
C10	8	4	7	9	3	0	9

- 1.41 The values obtained in Table 1-3 then help to discard the trips with a duration that exceeds the maximum value, as it can be assumed that these trips are stopping in the town. The result of this filtering process gives the number of trips that are through trips.

Results

- 1.42 The total number of through trips are shown in Table 1-4, with Table 1-5 setting out the proportion of trips that are represented by through trips.

Table 1-4: Results from the cumulative calculation of through trips

Starting camera	AM through trips	PM through trips	Total through trips
C1	668	558	1226
C3	620	988	1608
C4	360	184	544
C6	468	534	1002
C9	730	825	1555
C10	272	365	637
Total	3118	3454	6572

Table 1-5: Through trips compared to total trips for AM and PM peaks

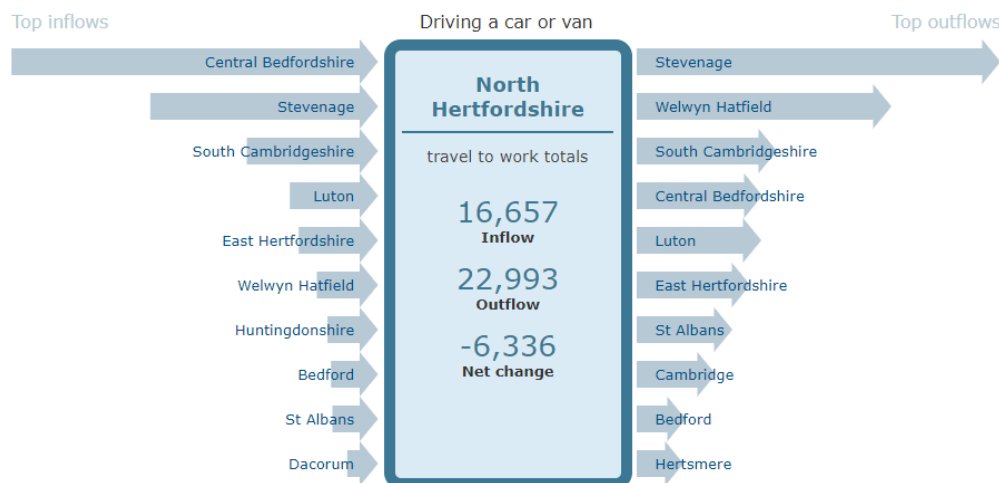
	AM	PM
Total Through trips	3118	3454
Total trips	6132	6715
% Through trips	51%	51%

1.43 The results show a cumulative percentage of 51% through trips in both peaks.

Origins and destinations of through trips

- 1.44 The ANPR survey only shows the points of entry and exit to the cordon and does not provide any data for the ultimate origins or destinations of the through traffic recorded. However, a number of inferences can be made when studying the Strategic Road Network (SRN) in the region.
- 1.45 For locations to the northwest of the town (Biggleswade, Bedford) and potentially further west such as Milton Keynes, trips to the southeast such as to Essex and Stansted are indirectly made via the SRN. Therefore, the connection through Baldock via the A507 is likely to be shorter. Local through trips are also likely to be a factor, for example the villages to the southeast of the town are likely to use the A507 to make trips to access the SRN and locations to the northwest. Many trips are also likely to be made from Letchworth through Baldock to access the SRN, either via North Road (to the A1(M)) or Royston Road (to the A505).
- 1.46 The Census data provides some corroboration of the regional movements described above, with large flows into and out of North Hertfordshire from Central Bedfordshire, as well as East Hertfordshire.

Figure 1-13: Census flow diagram for commuting movements (North Hertfordshire)



Research on through traffic in comparable towns

- 1.47 As set out above, the ANPR cordon data shows 51% of trips within Baldock are through traffic. Directly comparable data for other towns is not easily available. However, Table 1-6 highlights some examples of similar sized towns and data on through trips and HGV's.

Table 1-6: Table of traffic survey data from comparable towns/areas

Town	Data on through trips or HGV movements
Royal Tunbridge Wells A26 and A264	3% of all traffic classed as HGV Of this HGV traffic 28% were identified as through traffic Proportion of motorised vehicle through traffic 14% (through traffic defined as traffic then entered and exited the cordon within 40 minutes) AM peak higher proportion of HGV traffic for all junctions assessed AM peak slightly higher for all motorised vehicles for all junctions assessed
Hertford A414 Hertfordshire Count Council	20% of all A414 corridor movements passing the ANPR cordon classed as 'through trips'
Swaffham A47 and A1065	43% of the total observed "inbound trips" are through traffic Of these through trips 1% to 4% were HGV trips Maximum amount of HGVs on the network is 15%. Around 7% - 15% in the AM peak and 4% - 8% in the PM peak
Esher Traffic Survey	Average of 84% through trips 'taking less than 15 minutes to travel through cordon'. Much smaller cordon area. In the larger cordon area through trips were between 45% - 55% depending on direction of travel

- 1.48 The through trip percentage of 51% for Baldock puts it above most of the examples highlighted. It is also worth noting that the surveys in these locations were undertaken generally because there was a recognition that through traffic was causing negative impacts on the locations. Therefore, it is reasonable to conclude that through traffic levels would be on the high side.

2. Junction analysis

- 2.1 In addition to the ANPR cordon survey a range of junction and other traffic and multi-modal counts were undertaken. The analysis of this data at key locations is set out in the following sections.

Overview of junction performance

- 2.2 As shown below in Figure 2-1 the main congestion points within Baldock are along the B656 travelling through the centre of Baldock. The roundabouts to the south connected to South Road are busy junctions with junction 19 having 9,500+ total movements as seen in Table 2-1. This junction is a roundabout and is able to move the volumes of traffic effectively without causing significant queueing.

Figure 2-1: Summary of average queue lengths in Baldock across both AM and PM time periods

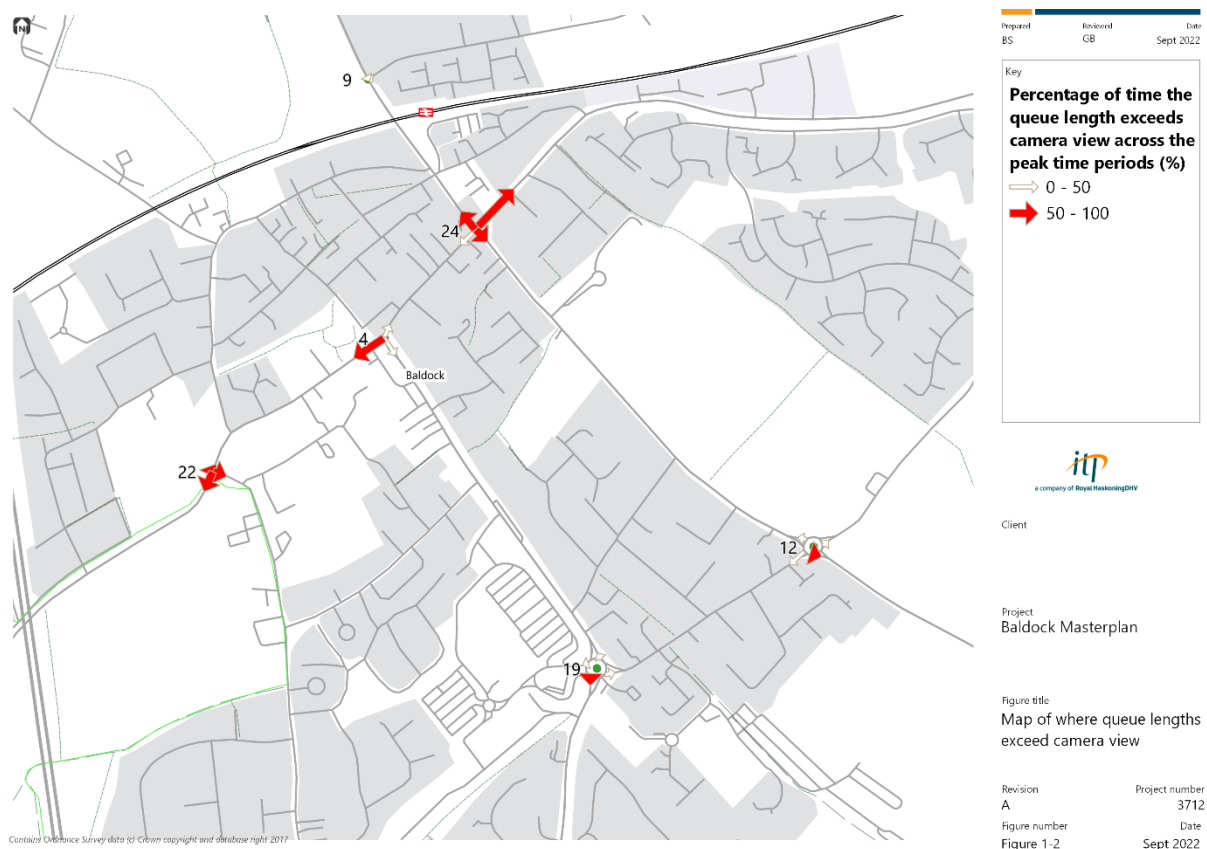


Table 2-1: Total movements and peak 1 hour AM/PM movements for the six junctions

Site	Total movements	Peak AM	Peak PM
24	7955	1,340	1,545
4	7710	1,347	1,530
22	6542	1,236	1,367
9	5480	856	1,090
12	6309	1,147	1,230
19	9549	1,705	1,953
Total	43,545	7,631	8,715

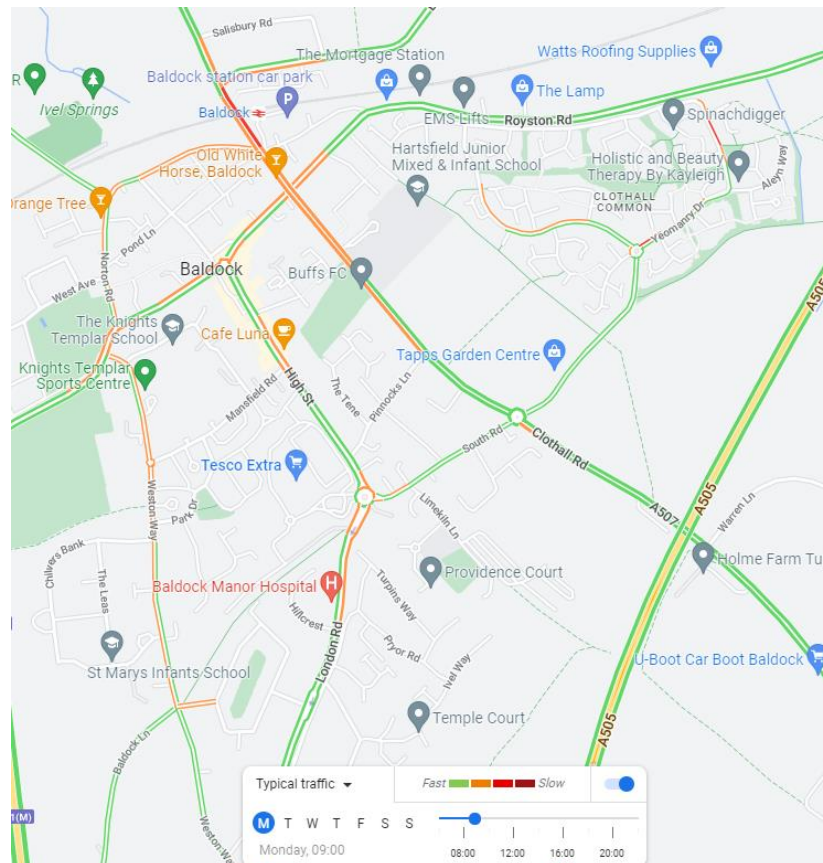
- 2.3 The PM flows were higher than the AM total across the three-hour period.
- 2.4 The data is limited by the extent of queue that is on view to each camera in the survey. The red arrows in Figure 2-2 show which queue lengths are longer than the camera view for more than 50% across both peak time periods. The main cameras affected are the ones along the B656 and therefore the inference can be made that the queue are longer than actually shown. This is less of an issue for the junctions with low queue lengths and therefore the data still captures the key pressure points on the network.

Figure 2-2: Summary of the percentage of time queue length exceeds camera view in Baldock across both AM and PM time periods



- 2.5 For reference, Figure 2-3 shows typical traffic flows recorded on Google maps and shows that the trends spotted are similar to the queue data captured. This additional analysis suggests there is delay from the Whitehorse Street / Station Road junction experienced beyond Bygrave Road. It also shows delay on Icknield Way and Norton Road, suggesting this is a well-used rat run.

Figure 2-3: A screenshot of typical traffic flows in Baldock for Monday 9am

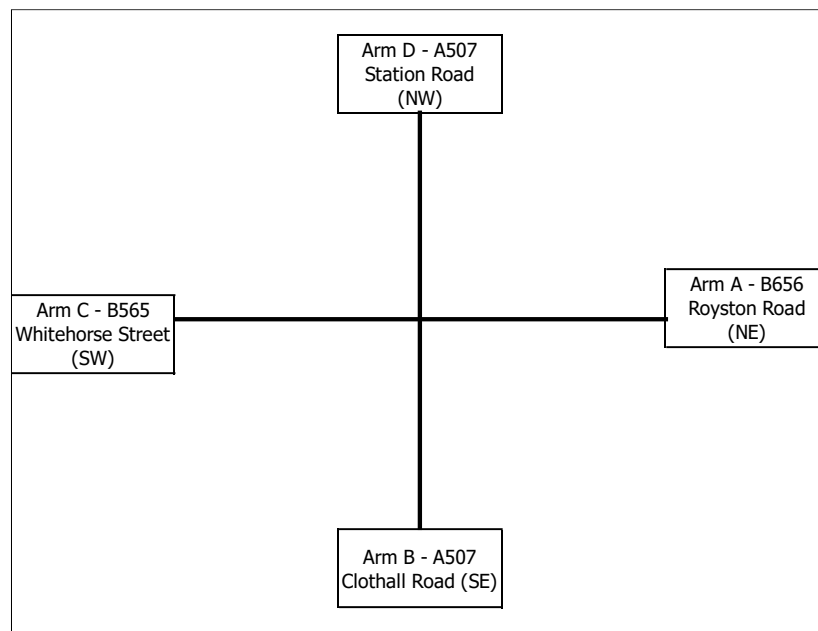


Station Road / Clothall Road

Weekday peak junction flows

- 2.6 This junction is in the centre of Baldock and is one of the most congested junctions in Baldock. In total, the junction recorded 7,955 trips with a split of 3,690 in the AM period and 4,265 trips in the PM period. During the peak hours the highest hourly flow recorded was 1,340 vehicles between 07:45 and 08:45 and 1,545 vehicles between 16:45 and 17:45 for the AM and PM peak respectively.

Figure 2-4- Site 24 junction layout with road names attached



2.7 The tables show the aggregated weekday AM (7:00-10:00) and PM (16:00-19:00) flows – all vehicles (including bicycles). The movements are split evenly with the top 5 flows covering between 10-14% of total flows:

- Whitehorse Street to Station Road (14%)
- Clothall Road to Station Road (14%)
- Whitehorse Street to Royston Road (13%)
- Station Road to Clothall Road (13%)
- Royston Road to Station Road (10%)

Table 2-2- Total weekday AM (07:00 – 10:00) and PM (16:00 – 19:00) counts between different arms of the sites 24

Counts		To				
		A	B	C	D	Total
From	A	0	171	773	826	1770
	B	143	0	164	1083	1390
	C	1068	107	0	1133	2308
	D	744	997	746	0	2487
	Total	1955	1275	1683	3042	7955

Table 2-3- Percentage splits of the weekday total AM and PM counts

Counts		To				
From		A	B	C	D	Total
	A	0%	2%	10%	10%	22%
	B	2%	0%	2%	14%	17%
	C	13%	1%	0%	14%	29%
	D	9%	13%	9%	0%	31%
	Total	25%	16%	21%	38%	100%

- 2.8 The movements most likely to be affected by any strategic route through site BA1 are those between Station Road and Royston Road, representing 19% of trips through the junction.

Weekend peak junction flows

- 2.9 This site also recorded data for the weekend peak between 11am and 2pm. The weekend peak flows were comparative to the weekday peak flows with a total of 3,963 trips being recorded. The peak flow was recorded between the hours 11:30am and 12:30pm at 1,397 trips. Overall the weekend individual movements were similar to the weekday with the top five individual movements were as follows:

- Whitehorse Street to Station Road (16%)
- Clothall Road to Station Road (13%)
- Whitehorse Street to Royston Road (12%)
- Station Road to Clothall Road (12%)
- Station Road to Whitehorse Street (12%)

Table 2-4: Total weekend peak (11:00 – 14:00) count between different arms of the site 24

Counts		To				
From		A	B	C	D	Total
	A	0	77	377	316	770
	B	67	0	91	523	681
	C	469	83	0	639	1191
	D	361	473	487	0	1321
	Total	897	633	955	1478	3963

Table 2-5: Percentage splits of the weekend peak counts

Counts		To				
		A	B	C	D	Total
From	A	0%	2%	10%	8%	19%
	B	2%	0%	2%	13%	17%
	C	12%	2%	0%	16%	30%
	D	9%	12%	12%	0%	33%
	Total	23%	16%	24%	37%	100%

Queue data

- 2.10 The junction layout can be seen in Figure 2-5 and shows two lanes of traffic for Whitehorse Street, three lanes of traffic for Royston Road and one lane of traffic each for Station and Clothall Road. The dataset is constrained by the length of queue that is visible to a camera. This means that for at least one of the five-minute timeslots, five out of the six lanes on show have the queue length exceeding camera view.

Figure 2-5: Station Road / Clothall Road junction layout



- 2.11 The data shows that the longest queue on average is lane A1 which is the right-hand lane travelling to Station Road from Royston Road. The other queue lengths vary between four to six vehicles, however lanes D1 and B1 will be longer than suggested as the length of queue exceeds camera view for the majority of the survey period. Lanes A2 and C1 represent the flow between Whitehorse Street and Royston Road and show

an average queue length of five vehicles. Lane A3 has minimal queuing time with cars heading from Royston Road onto Clothall Road here.

Table 2-6: Queue data for the seven lanes around Station Road / Clothall Road junction

Queue Name	% of time queue exceeds camera view	Average Number Of Vehicles Queuing	Average Queue Length (M)
Lane A1*	63%	15	92.9
Lane A2*	4%	5	32.5
Lane A3*	0%	0	0.3
Lane B1	98%	5	31.1
Lane C1**	50%	5	34.4
Lane C2**	29%	4	24.2
Lane D1	100%	6	38.3

*No AM data available

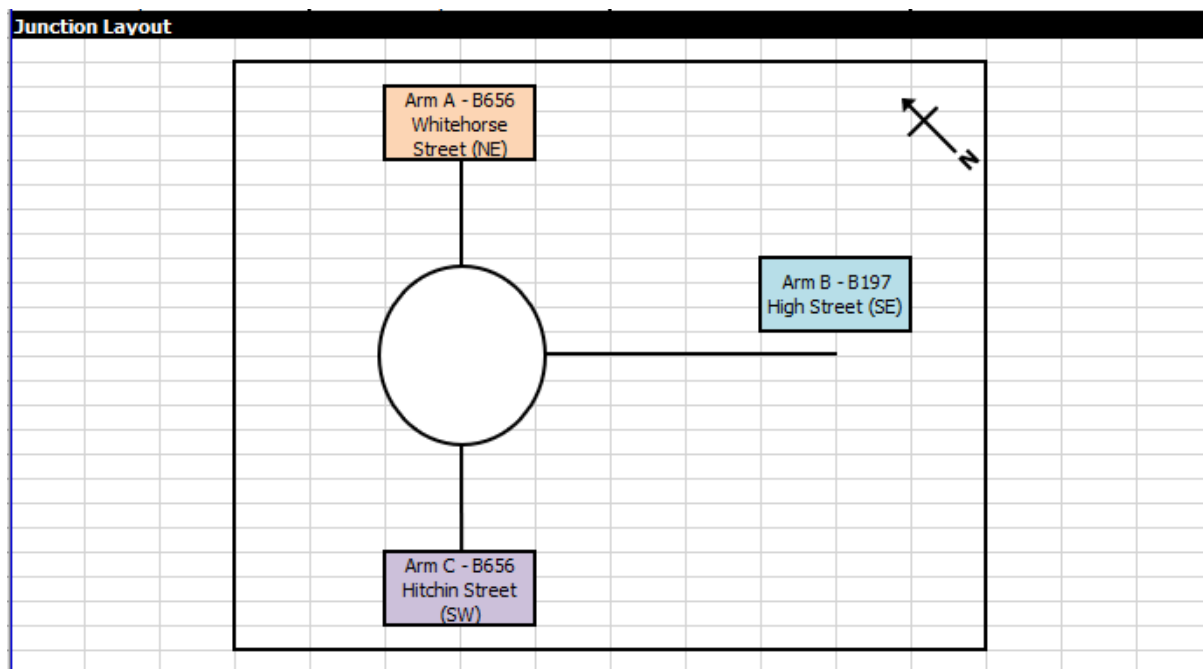
** Maximum queue length visible to camera was 2 for the AM

Hitchin Street / Whitehorse Street / High Street

Turning counts

- 2.12 The junction is a roundabout near Baldock high street between three roads. In total, the junction recorded 7,710 trips with a split of 3,523 in the AM period and 4,187 in the PM period. During the peak hours the highest hourly flow recorded was 1,347 vehicles between 08:15 and 09:15 and 1,530 vehicles between 17:00 and 18:00 for the AM and PM peak respectively.

Figure 2-6: Site 4 junction layout with road names attached



2.13 The tables show the aggregated weekday AM (7:00-10:00) and PM (16:00-19:00) flows – all vehicles (including bicycles). The movements are spread out with the top 5 flows covering between 12-25% of total flows:

- Hitchin Street to High Street (25%)
- High Street to Hitchin Street (20%)
- Hitchin Street to Whitehorse Street (18%)
- High Street to Whitehorse Street (15%)
- Whitehorse Street to Hitchin Street (12%)

Table 2-7: Total AM (07:00 – 10:00) and PM (16:00 – 19:00) counts between different arms of site 4

Counts		To			
From	A	A	B	C	Total
	B	7	760	926	1693
	C	1118	16	1551	2685
	Total	1371	1952	9	3332
		2496	2728	2486	7710

Table 2-8: Percentage splits of the Total AM and PM counts

Counts		To			
From	A	0%	10%	12%	22%
	B	15%	0%	20%	35%
	C	18%	25%	0%	43%
	Total	32%	35%	32%	100%

- 2.14 In total 45% of are between Hitchin Street and High Street (in both directions), with 30% of two-way trips between Hitchin Street and Whitehorse Street (in both directions). The high proportion of movements between Hitchin Street and High Street suggests traffic is seeking to avoid congestion at the Whitehorse Street junction, as well as avoiding congestion at J9 of the A1(M) when accessing Letchworth. Tesco is also likely to be drawing traffic along the High Street.

Queue data

- 2.15 The junction layout for queueing can be seen in Figure 2-7 and shows one lane of traffic for each of the roads.

Figure 2-7: Hitchin Street / Whitehorse Street / High Street junction layout



- 2.16 The data shows that on average the longest queue was for C1 with an average of ten cars in the queue across both peak time periods. Lanes A1 and B1 queue lengths have around half the number of vehicles queuing suggesting there is less congestion along these lanes. The high vehicular queue on lane C1 is explained by the turning count

analyses which showed 43% of traffic was coming from arm C (Hitchin Street). The queue in lane C1 exceeds the camera view for 71% which means the actual queue is likely to be longer than the lengths displayed.

Table 2-9: Queue data for the 3 lanes around Hitchin Street / Whitehorse Street / High Street junction

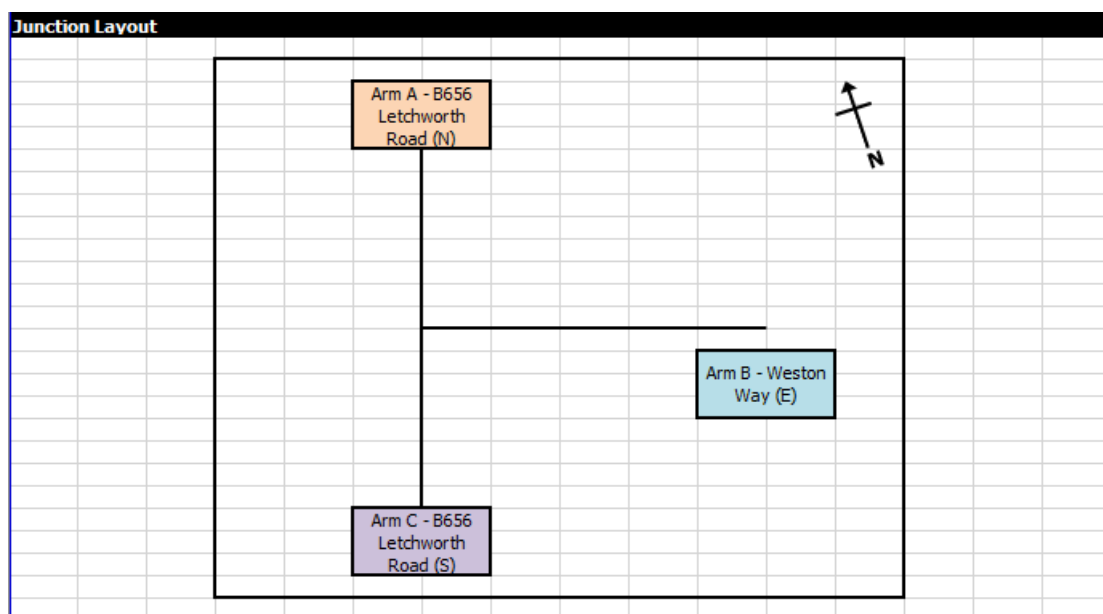
Queue Name	% of time queue exceeds camera view	Average Number Of Vehicles Queuing	Average Queue Length (M)
Lane A1	13%	4	22.8
Lane B1	0%	6	37.8
Lane C1	71%	10	62.1

Letchworth Road / Weston Way

Turning counts

- 2.17 This junction is in West Baldock and looks at traffic from Weston Way either leaving or joining Letchworth Road. In total, the junction recorded 6,542 trips with a split of 2,977 in the AM period and 3,565 in the PM period. During the peak hours the highest hourly flow recorded was 1,236 vehicles between 08:15 and 09:15 and 1,367 vehicles between 17:00 and 18:00 for the AM and PM peak respectively.

Figure 2-8: Site 22 junction layout with road names attached



- 2.18 The tables show the aggregated weekday AM (7:00-10:00) and PM (16:00-19:00) flows – all vehicles (including bicycles). The movements are spread out with the top 5 flows covering between 6-40% of total flows:

- Letchworth Road (S) to Letchworth Road (N) (40%)
- Letchworth Road (N) to Letchworth Road (S) (31%)
- Letchworth Road (S) to Weston Way (9%)
- Weston Way to Letchworth Road (S) (9%)
- Letchworth Road (N) to Weston Way (6%)

Table 2-10: Total AM (07:00 – 10:00) and PM (16:00 – 19:00) counts between different arms of site 22

Counts		To			
From		A	B	C	Total
	A	0	366	2036	2402
	B	354	0	561	915
	C	2622	603	0	3225
	Total	2976	969	2597	6542

Table 2-11: Percentage splits of the total AM and PM counts

Counts		To			
From	A	0%	6%	31%	37%
	B	5%	0%	9%	14%
	C	40%	9%	0%	49%
	Total	45%	15%	40%	100%

- 2.19 This shows that 71% of the traffic flow is running between Letchworth Road (N) and (S). Only 18% of the traffic flow is travelling between Letchworth Road (S) and Weston Way.

Queue data

- 2.20 The junction layout for queueing can be seen in Figure 2-9 and shows 1 lanes of traffic for traffic each of the roads.

Figure 2-9: Letchworth Road (N)/(S) / Weston Way junction layout



- 2.21 Three of the four lanes are heavily restricted by the camera view with the queue exceeding the cameras view for more than 60% of the time. For lanes A1, B1 and C2 the average number of vehicles queueing are very close to the maximum queue number. This means an interpretation is difficult to make. Lane C1 is not affected by this and shows an average number of three cars queueing to turn right into Weston

Way. Overall, it shows lane C1 to have the highest average of vehicles queuing which are motorists travelling from Letchworth into Baldock.

Table 2-12: Queue data for the four lanes around Letchworth Road (N)/(S) / Weston Way junction

Queue Name	% of time queue exceeds camera view	Average Number Of Vehicles Queuing	Maximum queue length in view of camera	Average Queue Length (M)
Lane A1	100%	2	2	13.3
Lane B1	63%	4	5	22.6
Lane C1	0%	3	N/A	16.3
Lane C2	71%	6	7	35.9

Bygrave Road / North Road

Turning counts

- 2.22 This junction is near the proposed development site with Bygrave Road currently running through the site up to Bygrave. This junction is important as traffic from the development will directly affect this junction. As well as this, the current traffic along Bygrave Road will need to be accommodated through the development.
- 2.23 In total, the junction recorded 5,480 trips with a split of 2,451 in the AM period and 3,029 in the PM period. During the peak hours the highest hourly flow recorded was 856 vehicles between 07:15 and 08:15 and 1,090 vehicles between 16:45 and 17:45 for the AM and PM peak respectively.

Figure 2-10: Site 9 junction layout with road names attached

