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NORTH WARWICKSHIRE
BOROUGH COUNCIL

RECEIVED

06/02/2023

**PLANNING & DEVELOPMENT
DIVISION**

APPENDIX C TRANSYT FUTURE YEAR MODELLING REPORT

1 INTRODUCTION

- 1.1 Tetra Tech (TT) have been appointed by Hodgetts Estates to provide technical support for their outline planning application for a proposed development of up to 100,000sqm of employment uses and 150 space overnight lorry park (including an associated 400sqm amenity block) on land to the northeast of M42 Junction 10. The application is also supported by a Transport Assessment (TA) prepared by Bancroft Consulting, Version C dated November 2021.
- 1.2 A Modelling Strategy Report dated 18th March 2022 was approved by Warwickshire County Council (WCC) and National Highways (NH). The Modelling Strategy identified the opening and future year assessments for Reference Case and Local Plan scenarios. This report follows the agreed strategy.
- 1.3 Traffic surveys to underpin a TRANSYT 16 model were undertaken in April 2022 and a network model was prepared. A 2022 Baseline Validation Report, dated 13th May 2022 sets out the surveys used, the model structure and its validation. The model was reviewed by AECOM, National Highways (NH) consultants. AECOM provided comments to the model and TT made various adjustments to the model and provided further clarifications. On 1st August 2022 the base TRANSYT 16 model was approved by AECOM and is suitable for use in assessing the future year scenarios.

2 AGREED SCOPE OF NETWORK

- 2.1 It has been agreed in the Modelling Strategy Report that in order to test the traffic impacts of the proposed development, the following four junctions require detailed analysis.
1. M42 Junction 10 Interchange (6 arm grade separated signalised roundabout)
 2. A5 Watling Street/ Site Access junction (proposed 3 arm signalised junction)
 3. A5 Watling Street/ Danny Morson Way (4 arm signalised junction, known as Birch Coppice)
 4. A5 Watling Street/ Meridian Drive (3 arm signalised junction, known as Core 42)

- 2.2 The first stage is now complete which has set up a validated 2022 baseline model of the existing operational performance for junctions 1, 3 and 4. This report considers the performance of the network without the proposed development (junctions 1, 3 and 4) and with the addition of the proposed development generated traffic and its associated access junction (junctions 1, 2, 3 and 4).

3 TRAFFIC FLOWS

Reference Case – 2026 Opening & 2031 Future Year Flows

- 3.1 As agreed with NH and WCC, an opening assessment year and future design year assessment is required for the reference case, i.e. without the Local Plan generated traffic and associated highway infrastructure. An opening assessment year of 2026 and future assessment year of 2031 has previously been agreed and will be the years used in this TRANSYT modelling assessment.
- 3.2 The following scenarios have been modelled in the AM peak (08:00 to 09:00) and PM peak (17:00 to 18:00) periods;
- a) 2026 Reference Case - No Development
 - b) 2031 Reference Case - No Development
- 3.3 The traffic flows have been extracted from the demand flows supplied by Vectos from the WCC Atherstone A5 PARAMICS model and for ease of reference Bancroft Consulting Figure 10 shows the AM peak flows for scenario a) and Figure 11 shows the PM peak flows also for scenario a) – both attached in Appendix A. Bancroft Consulting Figure 14 shows the AM peak flows for scenario b) and Figure 15 shows the PM peak flows also for scenario b) – both attached in Appendix A.
- 3.4 The traffic flows from the Bancroft TA did not include the Core 42 junction, therefore these have been added to the network diagram. The 2022 traffic surveys (discussed in the 2022 Baseline Validation Report) have been used to establish the current traffic to/ from Core 42 as well as the turning proportions, refer to TT Figure 1 at Appendix B for the AM peak and TT Figure 2 for the PM peak. Core 42 was not fully built and occupied at the time of the 2022

traffic surveys therefore the approved trip generation from the site has been extracted from the supporting Transport Assessment under the planning reference PAP/2013/0272. The turning proportions have been applied to the total predicted generated traffic at Core 42 and the development was assumed to be fully built and occupied for the 2026 and 2031 assessment years.

- 3.5 The Bancroft Consulting traffic flows show all vehicle movements, plus the HGV vehicle movements. As set out in the agreed LMVR, the flows have been converted to Passenger Car Units (PCU) by adding the HGV flow to the total vehicle movement effectively doubling the HGV flow and is effectively a 2.0 pcu factor. TT Figure 3 attached in Appendix B shows the 2026 Reference Case flows and TT Figure 4 shows the PM peak equivalent. TT Figure 5 attached in Appendix B shows the 2031 Reference Case flows and TT Figure 6 shows the PM peak equivalent.
- 3.6 The proposed site access junction as shown at TT Drawing B033920-TTE-00-ZZ-PL-H-0002 Rev P01 attached at Appendix C (discussed in more detail below) has been coded into the TRANSYT model to assess the following scenarios;
- c) 2026 Reference Case – With Development
 - d) 2031 Reference Case – With Development
- 3.7 Bancroft Consulting Figure 12 shows the AM peak flows for scenario c) and Figure 13 shows the PM peak flows also for scenario c) – both attached in Appendix A. Bancroft Consulting Figure 14 shows the AM peak flows for scenario d) and Figure 15 shows the PM peak flows also for scenario d) – both attached in Appendix A.
- 3.8 For the purpose of the TRANSYT model, the flows have been converted to Passenger Car Units (PCU) as described in para 3.5. TT Figure 7 attached in Appendix B shows the 2026 Reference Case + Development flows and TT Figure 8 shows the PM peak equivalent. TT Figure 9 attached in Appendix B shows the 2031 Reference Case + Development flows and TT Figure 10 shows the PM peak equivalent.

Proposed Site Access Arrangement

- 3.9 The proposed site access junction as shown at TT Drawing B033920-TTE-00-ZZ-PL-H-0002 Rev P01 attached at Appendix C. At the site access it is proposed to develop a 3rd lane from

the Junction 10 eastbound exit upto the site access stop line. The nearside lane is allocated for left turn and head movements, and the middle and offside lanes for ahead movements only. The A5 eastbound exit would facilitate an offside merge to DMRB standard. The site access would provide three lanes at the stop line, the nearside lane for left turning traffic and the middle and offside lanes for traffic turning right. On the A5 westbound movement it is proposed to retain the two ahead lanes and develop a third lane for traffic turning right into the site. On the westbound approach to Junction 10 it is proposed to lengthen the three lane flared section by circa 80m to cater for the additional traffic demands.

- 3.10 It is also proposed to provide a DMRB CD143 compliant 3m shared foot/ cycleway with a 2m separation strip on the north side of the A5 between the site access roundabout heading west to Junction 10. To the east of the site access junction the proposed 3m shared foot/ cycleway will run off carriageway within the development site as shown at TT Drawing B033920-TTE-00-ZZ-PL-H-0002 Rev P01 attached at Appendix C. The foot/ cycleway will connect to the existing foot/ cycleway on the A5 immediately before the A5/ Core 42 access junction.
- 3.11 Pedestrian and cycle controlled facilities are proposed across the site access junction and pedestrian only controlled facilities the A5 on the eastern side of the junction. The crossings can all run during traffic phases, ensuring no unnecessary delays to vehicles.
- 3.12 The proposals will also include diverting the 766/767 bus service into the site. In accordance with DMRB the existing eastbound bus layby is relocated to the west and at the same time the layby length will be increased and a modern bus shelter installed.

Local Plan – 2031 Future Year Flows

- 3.13 As agreed with NH and WCC, and as previously agreed during scoping discussions, a future design year assessment is required for the Local Plan case, which includes all the Local Plan allocations and associated highway infrastructure. A future assessment year of 2031 has been agreed with NH and WCC and will be the year used in this TRANSYT modelling assessment.
- 3.14 The Local Plan highways schemes and PARAMICS model included a mitigation scheme at Junction 10. It was agreed at a meeting held in March 2022 with NH and WCC that when assessing the network including the traffic associated with the Local Plan allocations, the

scheme at Junction 10 must be included. The Junction 10 proposal was supplied by WCC and is attached at Appendix B as Phil Jones Associates Drawing No. 02853-01 Rev A.

3.15 The following scenarios have been modelled in the AM peak (08:00 to 09:00) and PM peak (17:00 to 18:00) periods;

- e) 2031 Local Plan
- f) 2031 Local Plan – With Development

3.16 The traffic flows have been extracted from the demand flows supplied from the strategic PARAMICS model and for ease of reference Bancroft Consulting Figure 18 shows the AM peak flows for scenario e) and Figure 19 shows the PM peak flows also for scenario e) – both attached in Appendix A.

3.17 For the purpose of the TRANSYT model, the flows have been converted to PCU as described in para 3.5. TT Figure 11 attached in Appendix B shows the 2031 Local Plan flows and TT Figure 12 shows the PM peak equivalent.

2031 Reference Case – With Development

3.18 Bancroft Consulting Figure 20 shows the AM peak flows for scenario f) and Figure 21 shows the PM peak flows also for scenario f) – both attached in Appendix A.

3.19 For the purpose of the TRANSYT model, the flows have been converted to PCU as described in para 3.5. TT Figure 13 attached in Appendix B shows the 2031 Local Plan + Development flows and TT Figure 14 shows the PM peak equivalent.

4 REFERENCE CASE MODELLING RESULTS

No Development

4.1 The approved baseline TRANSYT model has been used to assess the predicted performance of the network in 2026 and 2031. The 2022 flows have been replaced by the reference case flows and the 2022 timings were initially used. The model predicted extensive queueing and delays and so improvements to the signal timings were required. The Lane Simulation feature in TRANSYT does not have the capability to optimise the signal timings, therefore the model

was switched to the Platoon Dispersion Model (PDM) with flared approaches and the internal circulatory stop lines on Junction 10 switched to “flared” approaches to model any blocking back effects. The PDM was optimised and an 80 second cycle time for all junctions was considered to provide the lowest Network Performance Index.

4.2 The model was then switched back to Lane Simulation and the signal timings retained. An iterative process was carried out, manually adjusting the signal timings each time to get the network to perform with the lowest queues and delays, similar to how it would operate in the real world under MOVA control. In addition to the manual phase timings, the following changes were also implemented at the A5 Birch Coppice junction;

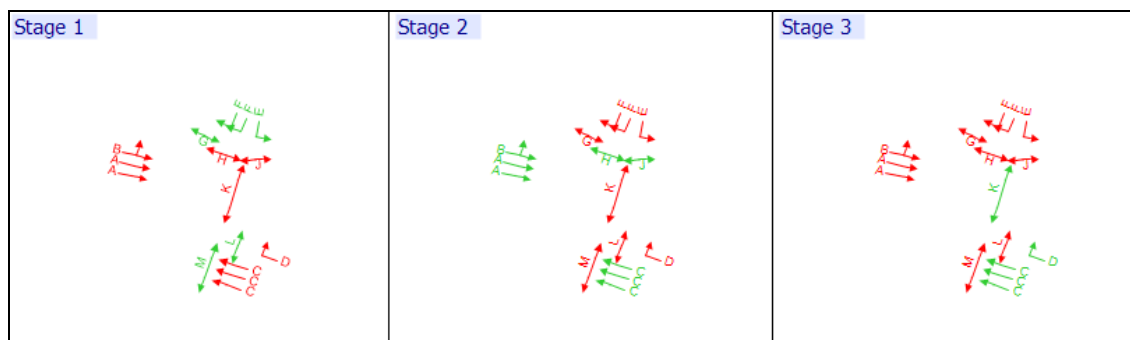
- The pedestrian phase G (across the A5 westbound movement) was removed from stage 4 in order to increase the phase B phase time (A5 westbound traffic stream).
- The pedestrian phase G was extended between stage 2 and 4 to lengthen the time available for pedestrians to cross the road.
- Within the confines of the intergreen timings, phase D (left turn out of Birch Coppice) was adjusted to start 3 seconds earlier.

4.3 The 2026 and 2031 AM Peak No Development results are shown at Table 4.1 in Appendix D. The results are discussed in more detail later on when comparing to the With Development results.

With Development

4.4 The approved baseline TRANSYT model has been updated to incorporate the proposed site access junction arrangement as shown at TT Drawing B033920-TTE-00-ZZ-PL-H-0002 Rev P01 in Appendix C. It should be noted that the proposed westbound flared approach extension to Junction 10 was modelled with a slightly shorter extension of some 50m. The proposed stage sequence of the new site access junction is shown below at Image 4.1. Phases G, H and J across the site access junction are for pedestrians and cyclists, whilst phases M, L and K across the A5 are for pedestrians only.

Image 4.1- Proposed Site Access Stage Sequence



4.5 The volume of traffic departing the site in the AM (148pcu) and PM (216pcu) peaks is relatively low and as such it is unlikely that the site access arm (Stage 1) will be required every cycle. However, for robustness, Stage 1 has been assumed to be activated every cycle. The volume of right turning vehicles into the site is low at 44pcu in the AM peak and 14pcu in the PM peak, therefore Stage 3 which facilitates the phase D right turn has been set up to occur every 2nd cycle.

4.6 It has been assumed for the AM and PM peak scenarios that 20% of traffic travelling eastbound on the A5 at the site access junction will use the offside ahead lane. In the AM peaks it has been assumed that 35% of A5 eastbound ahead traffic will use the nearside lane (+ the left turning traffic) and 45% use the middle lane. The imbalance in ahead flows is to take account of the development generated traffic turning left into the site from the nearside lane. In the PM peaks it has been assumed that 40% of eastbound ahead traffic will use the nearside and middle lanes.

2026 & 2031 AM Peak Existing Arrangement Summary Results

4.7 The 2026 and 2031 AM Peak results are shown at Table 4.1 in Appendix D.

4.8 The results show that in the 2026 No Development scenario in the AM Peak there is a long queue of over 55pcu and nearly 3½ min delay on the A5 Eastbound Lane 1 (stream 8/1 etc.) at Junction 10. The effects of the development generated traffic would increase this queue to 107pcu with a 3 minute increase in delay. The queue in the A5 Eastbound Lane 3 (stream 8/3 etc in the table) increases from 58pcu to 117pcu with a 2½ minute increase in delay. On all of the other lanes on the network the impact of the proposed development is considered

negligible to minor with queue increases of no more than 6pcu and no more than 16 sec increase in delay. The proposed site access junction is predicted to operate well with queues of no more than 15pcu on the A5 eEastbound approach (stream 56/1). Queueing does not extend back to affect the operation of Junction 10. The model predicts a queue of 2pcu with a 1min 5sec delay on the A5 right turn (stream 60/1) into the site.

4.9 In the 2031 AM peak scenario, the effects of the proposed development are similar to 2026 in that the A5Eastbound approach (stream 8/1 etc) to Junction 10 increases from 110pcu queue to 157pcu with a delay increase of 2½ mins in the nearside lane, whilst the A5 Eastboundoffside lane (stream 8/3 etc) increases from 82pcu to 145pcu with a 2½ min delay increase. On all of the other lanes on the network the impact of the proposed development is considered negligible to minor with queue increases of no more than 7pcu and no more than a 22 sec increase in delay. The proposed site access junction is predicted to operate well with queues of no more than 16pcu on the A5 eastbound approach (stream 56/1). Queueing does not extend back to affect the operation of Junction 10. The model predicts a queue of 2pcu with a 1min 4 sec delay on the A5 right turn (stream 60/1) into the site.

4.10 The results demonstrate mitigation is required to reduce the queueing and delays on the A5 eastbound approach to Junction 10, discussed later in this note.

2026 & 2031 PM Peak Existing Arrangement Summary Results

4.11 The 2026 and 2031 PM Peak results are shown at Table 4.2 in Appendix D.

4.12 The results show that in the 2026 No Development scenario in the PM Peak the queuing on the A5 Eastbound Lane 1 approach (stream 8/1 etc) at Junction 10 is significantly less than the AM peak with the longest queue of 14pcu which will increase by 13 pcu to 27pcu and the delay increases by 47 seconds with the proposed development traffic. The M42 Northbound Offslip is predicted to operate with a 16pcu queue and 2 minute 10 sec delay on the busiest lane, Lane 5 (stream 3/2), but would only increase by 7pcu with an additional 59 sec delay with the development generated traffic. On the A5 Westbound approach to Junction 10 the longest queue is predicted to be 24pcu with a 54 sec delay in Lane 3 (stream 23/3 etc), which would increase to a 36pcu queue and a 27 sec delay increase. The A5 Westbound Lane 4 (stream 23/4 etc) has a 15pcu queue in the No development scenario and would increase to 28pcu with a 26 sec delay increase. On all of the other lanes on the network the impact of the proposed

development is considered negligible to minor with queue increases of no more than 3pcu and no more than 10 sec increase in delay.

- 4.13 In the 2031 PM peak scenario the effects of the proposed development are similar to 2026 in that the A5 Eastbound approach (stream 8/1 etc) at Junction 10 is significantly less than the AM peak with the longest queue of 12pcu which would increase by 6 pcu to 18pcu and the delay increases by 40 seconds to 1 minute 10 sec with the proposed development traffic. The M42 Northbound Offslip is predicted to operate with a 15pcu queue and 2 minute 1 sec delay on the busiest lane, Lane 5 (stream 3/2), but would only increase by 1pcu with an additional 14 sec delay with the development generated traffic. On the A5 Westbound approach to Junction 10 the longest queue is in Lane 3 and is predicted to be 34pcu with a 1 minute 10 sec delay, which would increase to a 35pcu queue with development. The A5 Westbound Lane 4 (stream 23/4 etc) has a 18pcu queue in the No development scenario and would increase to 29pcu with a 18 sec delay increase in the With Development scenario. On all of the other lanes on the network the impact of the proposed development is considered negligible to minor with queue increases of no more than 4pcu and no more than 43 sec increase in delay.

Proposed Mitigation Results

- 4.14 It is clear from the AM peak hour results that mitigation is required to reduce the queueing and delays on the A5 Eastbound approach to Junction 10 as a result of the development generated traffic.
- 4.15 There is an opportunity to increase the capacity of the A5 eastbound approach by developing a 4th lane at the stop line and creating a 3-lane section up to the Pennine Way eastbound merge arrangement. In addition, a fourth lane would be added on the circulating lanes adjacent to Green Lane. TT Drawing B033920-TTE-00-ZZ-PL-H-0001 Rev P01 attached at Appendix C shows the proposed improvement works.
- 4.16 Owing to land constraints on the A5 Eastbound approach some 170m west of the stopline the offside and middle lanes have been reduced from 3.5m to 3.0m. The nearside lane width has been retained at 3.5m and 1.0m hard strips have also been retained, both nearside and offside. In addition the foot/cycle way has been reduced from 2.0m to 1.8m and the separation from moving vehicles reduced from 1.5m to 1.0m. In association with the reduction in two lane widths and reduction in the foot/cycleway, it is proposed that the speed limit is reduced on the

eastbound A5 carriageway from national (70mph) to 50mph between the Pennine Way overbridge in the west to the existing 50mph speed limit which commences 500m east of Jn10. It is also proposed that the existing 50mph speed limit on the A5 westbound carriageway is extended by 500m to Jn10.

- 4.17 It is also proposed to install toucan crossing facilities on the M42 north facing slip roads and on Green Lane. This would significantly enhance the safety of the crossing facilities for pedestrians and cyclists. The crossing facilities have been coded into the TRANSYT model to model any queuing back effects. The crossing phase would occur every cycle at the M42 southbound off-slip and on the Green Lane approach to Junction 10, whilst it has been assumed the crossing phase would be called on demand, every other cycle on the exit to the M42 northbound and the exit to Green Lane.
- 4.18 The modelling also replicates the full proposed westbound flared extension to Junction 10 from the site access as shown at TT Drawing B033920-TTE-00-ZZ-PL-H-0002 Rev P01 attached at Appendix C.
- 4.19 The 2026 and 2031 results with the mitigation proposals are shown at Tables 4.1 and 4.2 in Appendix D.
- 4.20 Focusing on the 2031 assessment year, the results show that in the AM peak the A5) Eastbound improvement significantly reduces the queuing and delays. The No Development scenario has a queue of 110pcu in Lane 1 (stream 8/1 etc) and 82pcu in Lane 3 (stream 8/3 etc), whilst with the proposed improvement together with the additional traffic the queue in Lane 1 reduces to 3pcu and the delay reduces from 6¼ minutes to 10 seconds per vehicle (compared to No Development), whilst the queue in Lane 3 reduces from to 18pcu with a 3 minute reduction in delay (compared to No Development). With the mitigation in place, the traffic queues on the A5 would not extend back to beyond the Pennine Way slip road merge, as a result queuing is very unlikely to extend back to affect the operation of the Pennine Way roundabout junction and is a significant betterment to the No Development scenario. The queues and delays on all the other lanes on the network are broadly the same in the No Development and With Development scenarios.
- 4.21 In the 2031 PM peak hour, the queues and delays on the majority of the lanes on the network are broadly the same in the No Development and With Development scenarios, where there

are increases, they are not considered severe. For example, on the M42 northbound off-slip the queue in Lane 5 (stream 3/2) increases from 15pcu to 20pcu and the delays increases by 39 secs. This queue is readily accommodated on the slip road with very low risk of extending back to the M42 mainline.

Summary

- 4.22 The proposed development generated traffic has a significant impact on the performance and operation of the A5 Eastbound approach to Junction 10 in the AM peak hour, which requires mitigation. With carriageway widening to the A5 Eastbound approach and to the circulating island adjacent to Green Lane, the performance of the Eastbound approach is significantly improved. The proposed mitigation works also provide safety enhancements for pedestrians and cyclists crossing the M42 north facing slip roads and Green Lane, a considerable betterment to the existing crossing facilities.
- 4.23 With the proposed site access junction and mitigation works to Junction 10, it is considered they satisfy all of the components of NPPF paragraph 110; that the site is highly accessible by sustainable modes of travel; that the proposed highway works and alterations constitute “safe, suitable, adequate and cost effective mitigation”, that there would be no unacceptable impact on highway safety, and no residual cumulative highway impacts that could be considered to be severe.

5 LOCAL PLAN MODELLING RESULTS

No Development

- 5.1 Following discussions with NH and WCC, the Local Plan scenario includes an assessment of the M42 Junction 10 indicative scheme as shown at Phil Jones Associates Drawing 02853-01 Rev A attached in Appendix C. The indicative scheme includes the following improvements:
- Re-align the existing A5 eastbound merge taper as a lane gain from Pennine Way;
 - Fourth lane added to the A5 eastbound approach to Junction 10.
 - The central island at Green lane modified to create a 4th lane, facilitating a 2 lane exit to the M42 north.

- Amend the M42 southbound slip road to create a segregated left turn lane with a physical island, the lane then merges into the A5 eastbound carriageway.
- Third Lane added to the Trinity Road approach.
- A new/ widened southern overbridge to facilitate 4 lanes.

5.2 The 2031 AM and PM Peak No Development results are shown at Table 5.1 in Appendix D. The results are discussed in more detail later on when comparing to the With Development results.

With Development

5.3 The No Development model with the Local Plan indicative scheme discussed above has been used as the base and adjusted for the following:

- Site access junction added, operating with the same stage sequence and frequency as per the Reference Case model, see Chapter 4.
- To facilitate the site access junction the segregated left turn slip arrangement from the M42 southbound slip road has been removed, effectively leaving the arrangement as it is.
- Removing the 2 lane exit to the M42 northbound on slip road.
- The inclusion of 4 toucan crossing facilities on the M42 north facing slip roads and Green Lane.

5.4 The 2031 AM and PM Peak With Development results are shown at Table 5.1 in Appendix D. The results are discussed in more detail below.

2031 AM & PM Peak Local Plan Summary Results

5.5 The 2031 AM and PM peak results comparing the Local Plan scenario with and without the proposed development are shown at Table 5.1 in Appendix D.

5.6 In the AM peak the results show the biggest increase in queue and delay at Junction 10 is on the A5 Eastbound approach, Lane 2 (stream 8/2 etc) with the queue increasing from 14pcu to

33pcu and the delay increasing from 32 secs to 1 minute 37 secs. Although the queue increases on this approach, it is significantly less than the No Development scenario in the Reference Case scenario (110pcu) and the queue is unlikely to extend back and affect the performance of the Pennine Way roundabout junction. The proposed development generated traffic has negligible to minor impacts on the other approaches to Junction 10.

- 5.7 The site access junction performs well with manageable queues and delays. The A5 Eastbound, Lane 2 (stream 56/2 etc) queue of 23pcu and 24 secs delay does not extend back and interfere with the performance of Junction 10. The A5 Westbound, Lane 2 (stream 59/3 etc) operates with a queue of 11pcu and 16 sec delay. The site access operates with queues of 1pcu on each lane with delays all under 30 secs.
- 5.8 The queues and delays at the A5/ Birch Coppice junction are very similar in the No Development and With Development scenarios. At the A5/ Core 42 junction the A5 Westbound, Lane 1 (stream 49/2) queue increases from 85pcu to 92pcu with a 23 sec delay increase.
- 5.9 In the PM peak the results show the biggest increase in queue and delay at Junction 10 is on the A5 Eastbound Lane 3 (stream 8/3 etc) approach with the queue increasing from 41pcu to 66pcu and the delay increasing from 2 minutes 27 secs to 3 minutes 59 secs. The queue on Lane 2 (stream 14/2) of the Green Lane approach increases from 19pcu to 26pcu with a 1 minute 19 sec delay increase. The proposed development generated traffic has negligible to minor impacts on the other approaches to Junction 10.
- 5.10 The site access junction performs well with manageable queues and delays. The A5 Eastbound Lane 1 (stream 56/1 queue of 15pcu and 24 secs delay does not extend back and interfere with the performance of Junction 10. The A5 Westbound, Lane 1 (stream 59/2 etc) operates with a queue of 13pcu and 18 sec delay. The site access operates with queues of 1pcu on each lane with delays all under 30 secs.
- 5.11 The queues and delays at the A5/ Birch Coppice junction are broadly similar in the No Development and With Development scenarios. At the A5/ Core 42 junction the A5 Westbound Lane 1 (stream 49/2) queue increases from 39pcu to 46pcu with a 18 sec delay increase.

- 5.12 The residual cumulative impact of the proposed development in the AM and PM peaks on the performance of the indicative the Local Plan scheme for M42Jn10 are not considered severe with reference to NPPF para 111.

6 SUMMARY

- 6.1 TT have been appointed by Hodgetts Estates to provide technical support of their outline planning application for a proposed development of up to 100,000sqm of employment uses and 150 space overnight lorry park (including an associated 400sqm amenity block) on land to the northeast of M42 Junction 10.
- 6.2 To assess the impacts of the proposed development its has been agreed with NH and WCC to assess the M42 Junction 10 interchange, the A5/ Birch Coppice and A5/ Core 42 signalised junctions, and with the site access junction in the With Development scenarios. It was also agreed to assess a Reference Case scenario in 2026 and 2031, whilst a Local Plan scenario in 2031 was also considered necessary.
- 6.3 In the Reference Case scenario mitigation was required to address the impacts of the proposed development particularly on the A5 Eastbound approach to M42 Junction 10 in the AM peak. A scheme has been identified which would considerably reduce the queuing and delays on the A5 Eastbound approach, a significant improvement compared to the No Development scenario. Meanwhile enhanced and widened pedestrian/ cycle provisions around Junction 10 together with toucan crossings on the M42 north facing slips and Green Lane would also provide substantially safer crossing facilities.
- 6.4 In the Local Plan scenario, an indicative improvement scheme provided by WCC has been assessed which shows the proposed development does not have a severe impact when comparing to the No Development scenario. Indeed, the modelling has also shown that a left turn segregated slip from the M42 southbound slip road is not required, whilst, as part of the proposed development, toucan crossing facilities would also be provided on the M42 north facing slips and Green Lane.

- 6.5 This modelling note has demonstrated the proposed signalised site access junction can be readily accommodated on the network which, with mitigation in the Reference Case scenario, achieves the aims set out at para 110 of NPPF. In the indicative Local Plan scenario the proposed development does not have a severe impact with reference to NPPF para 111.

APPENDIX A

BANCROFT CONSULTING FIGURES

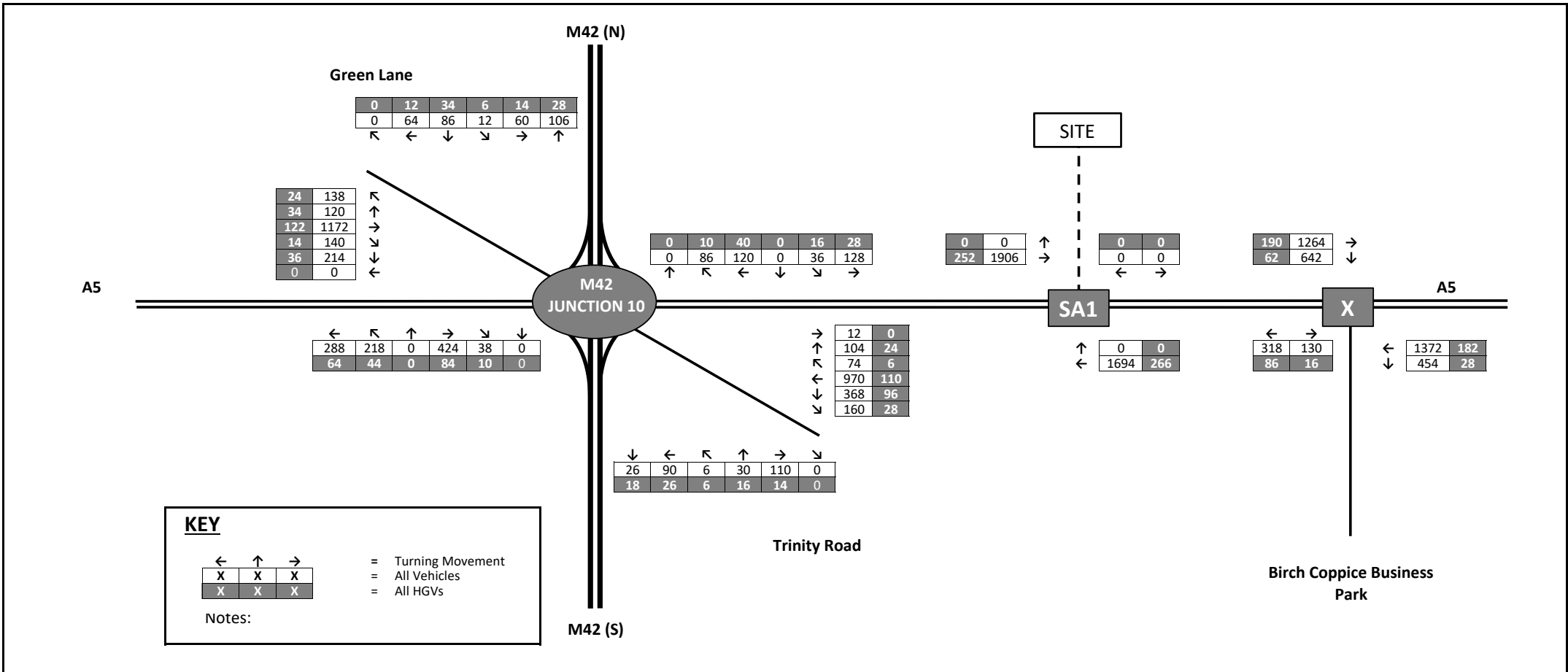


FIGURE 10
 2026 REFERENCE - AM PEAK (0800 TO 0900) - DEMAND FLOWS
 LAND NORTH OF THE A5, DORDON

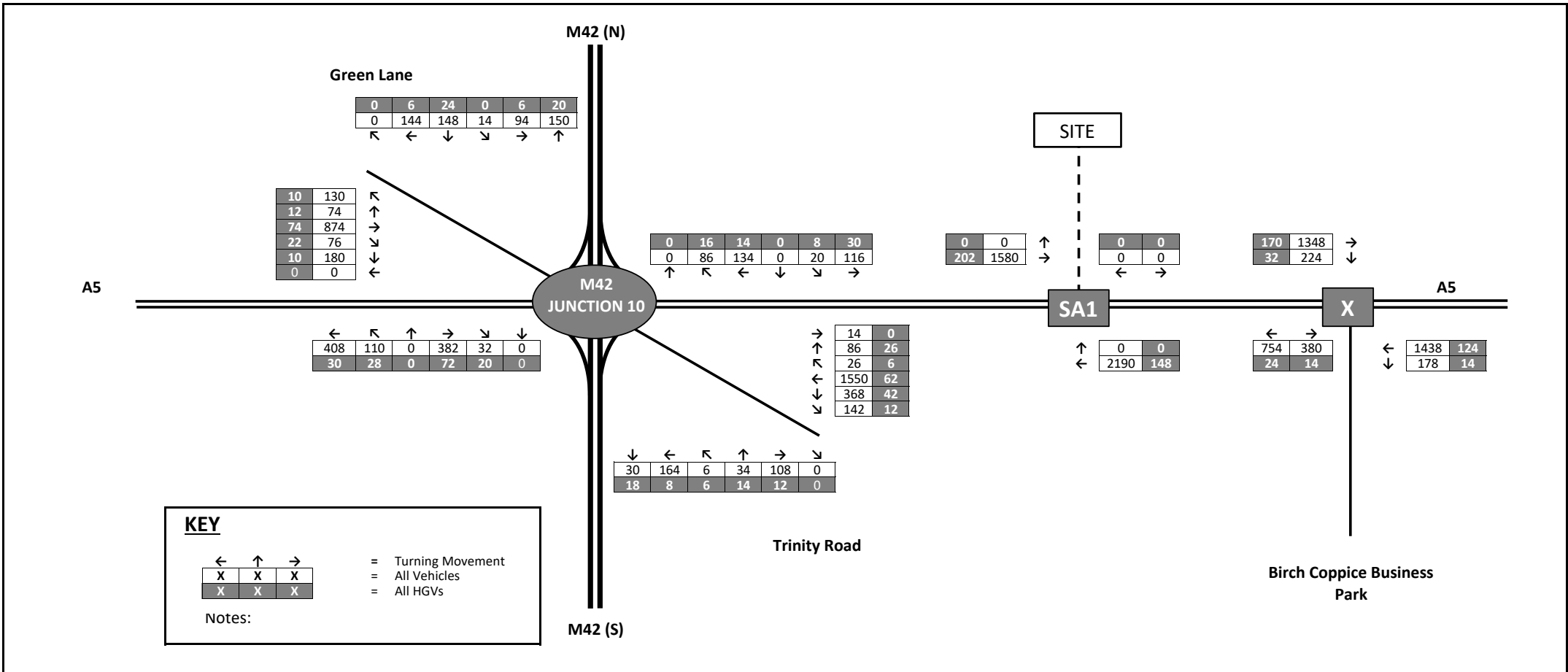


FIGURE 11
 2026 REFERENCE - PM PEAK (1700 TO 1800) - DEMAND FLOWS
 LAND NORTH OF THE A5, DORDON

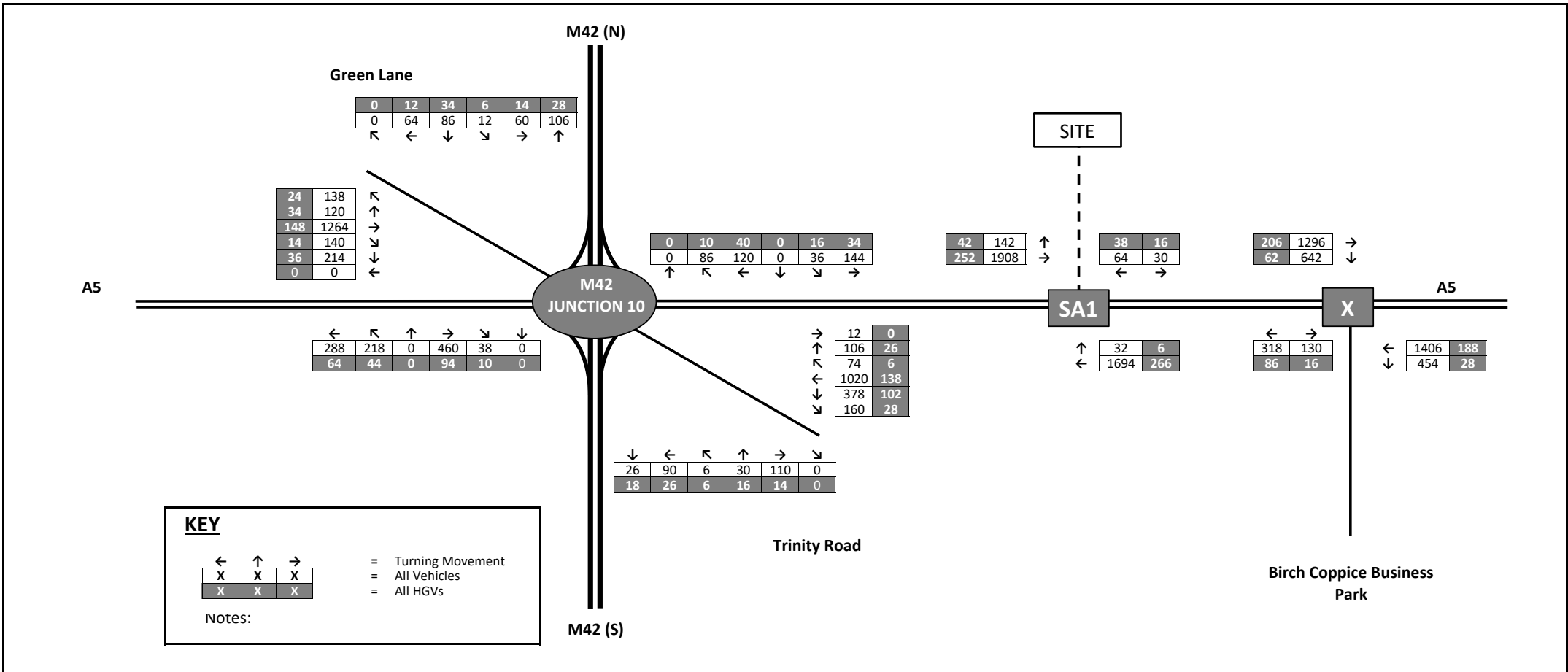


FIGURE 12
 2026 REFERENCE + DEVELOPMENT - AM PEAK (0800 TO 0900) - DEMAND FLOWS
 LAND NORTH OF THE A5, DORDON

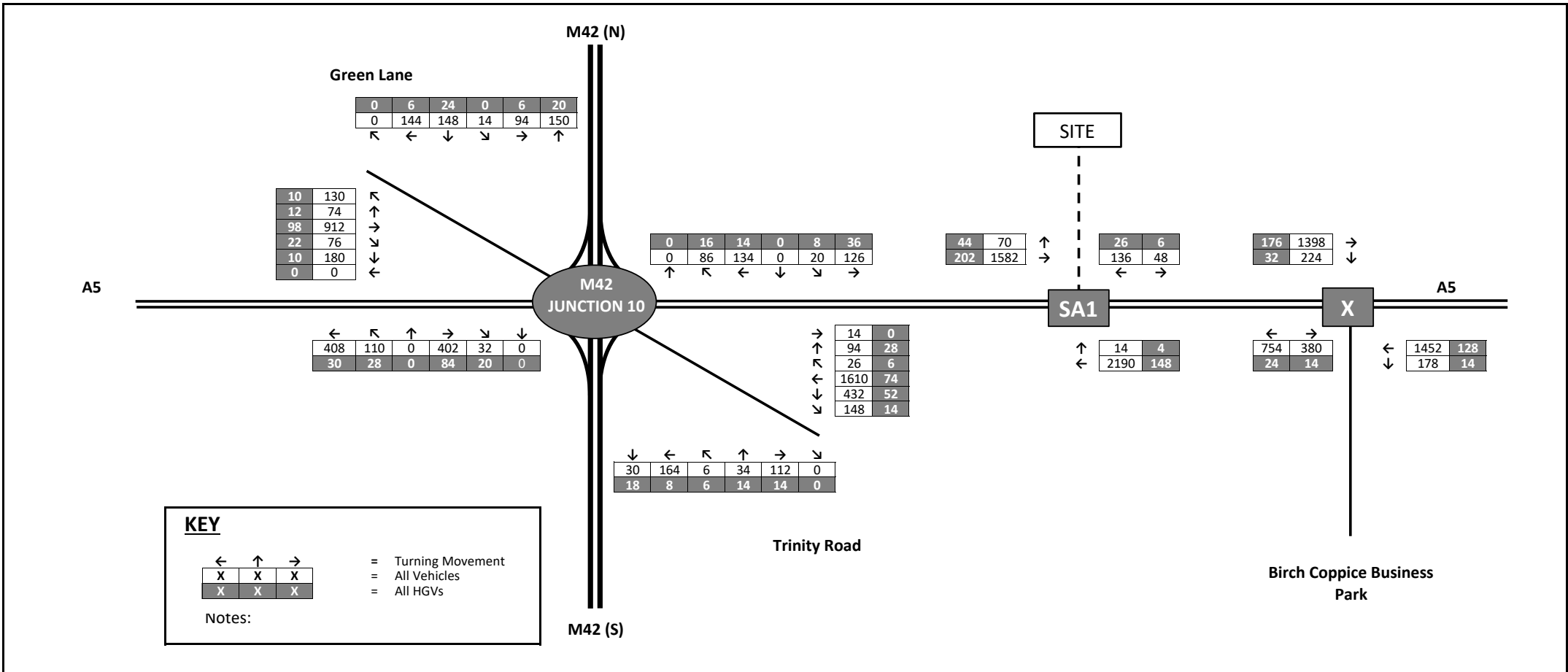


FIGURE 13
 2026 REFERENCE + DEVELOPMENT - PM PEAK (1700 TO 1800) - DEMAND FLOWS
 LAND NORTH OF THE A5, DORDON

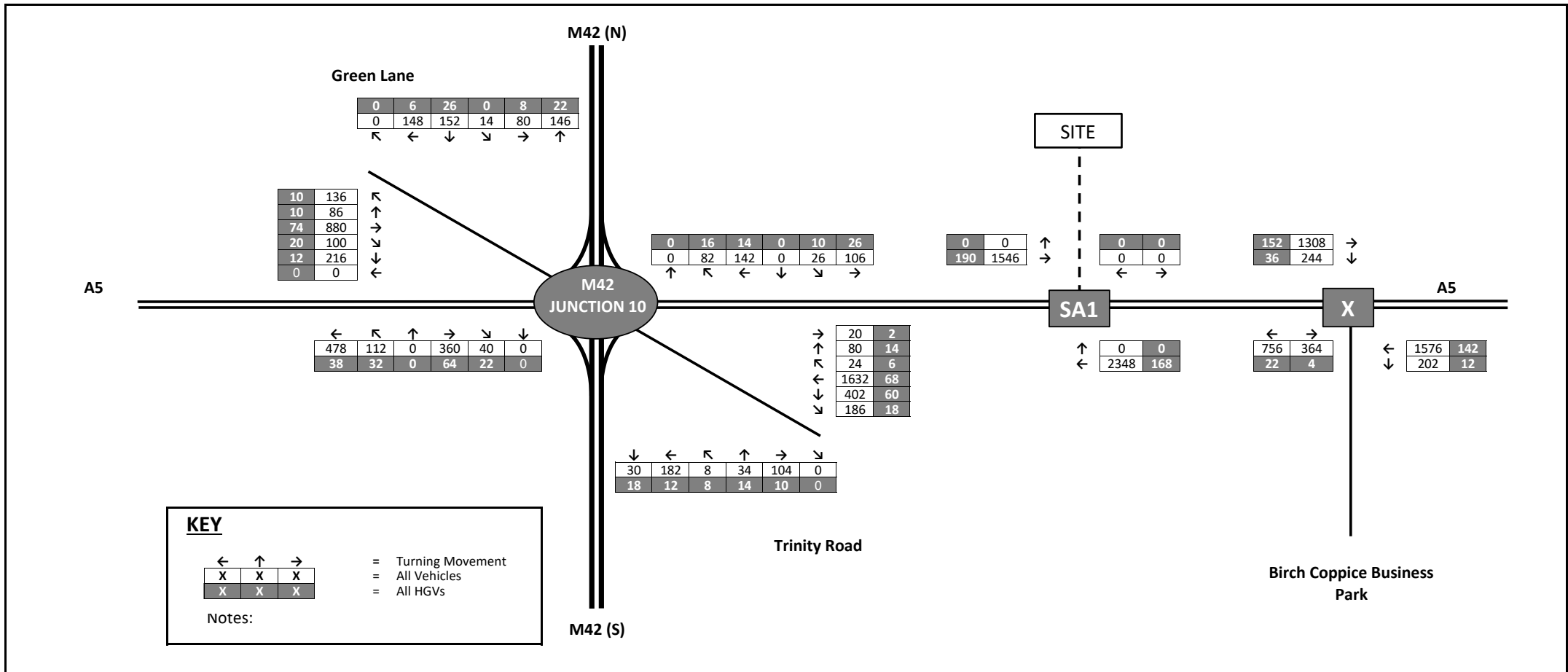


FIGURE 15
 2031 REFERENCE - PM PEAK (1700 TO 1800) - DEMAND FLOWS
 LAND NORTH OF THE A5, DORDON

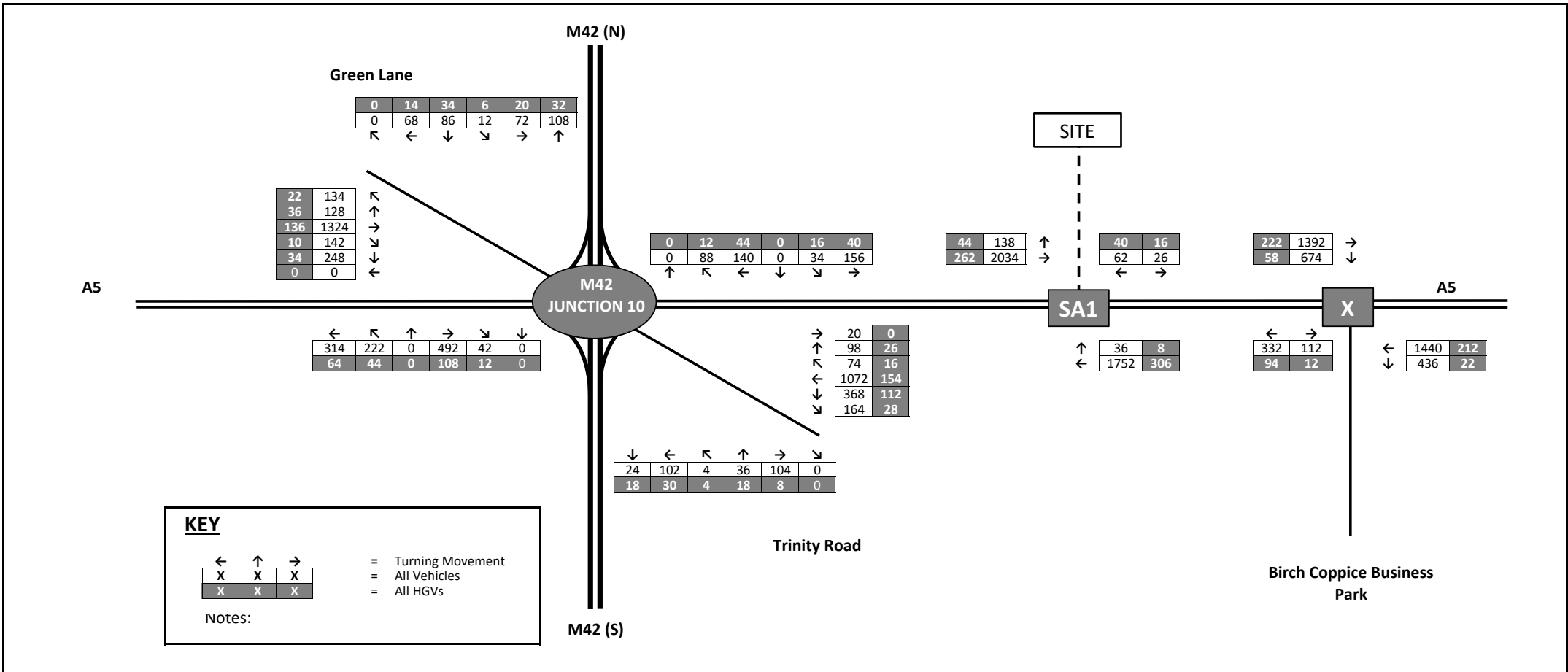
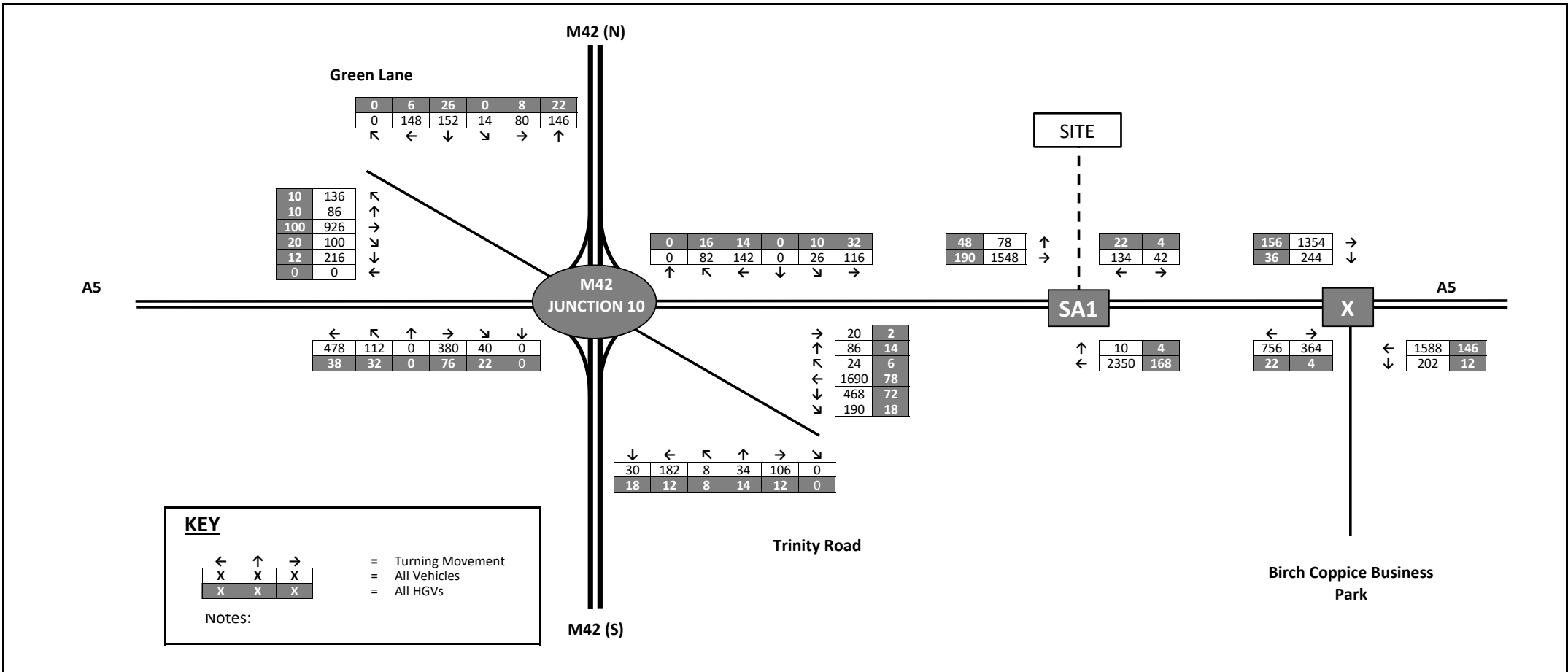


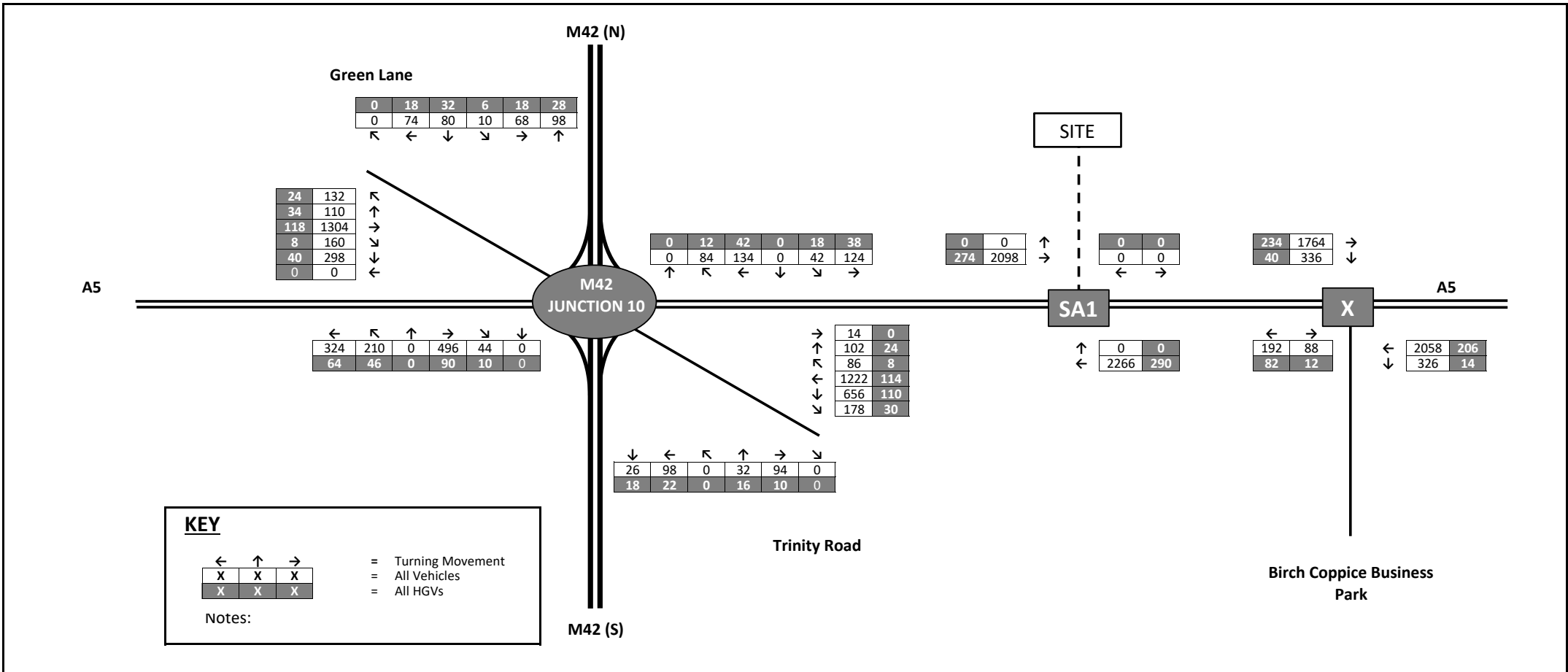
FIGURE 16
2031 REFERENCE + DEVELOPMENT - AM PEAK (0800 TO 0900) - DEMAND FLOWS

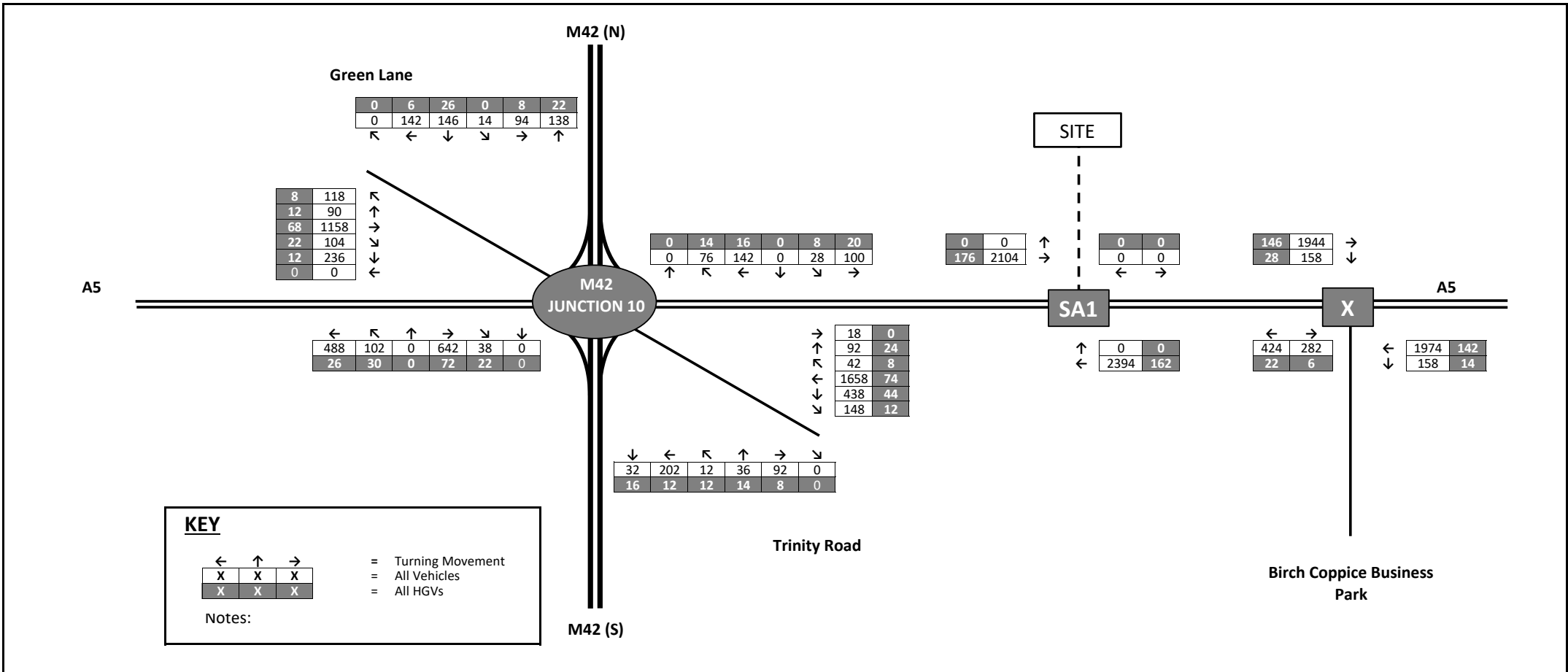
LAND NORTH OF THE A5, DORDON

JOB NUMBER: F19123

DRAWN BY: CAB







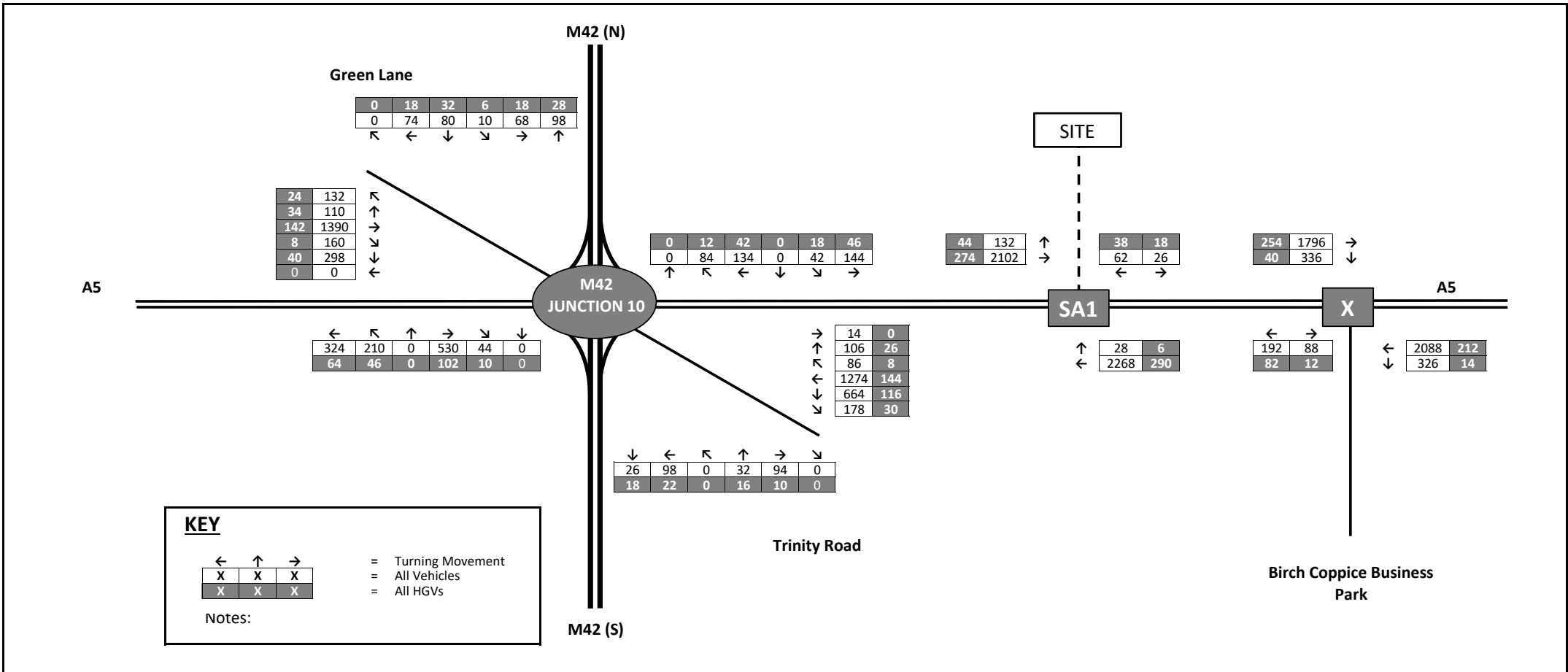


FIGURE 20
2031 LOCAL PLAN + DEVELOPMENT - AM PEAK (0800 TO 0900) - DEMAND FLOWS

LAND NORTH OF THE A5, DORDON

JOB NUMBER: F19123

DRAWN BY: CAB

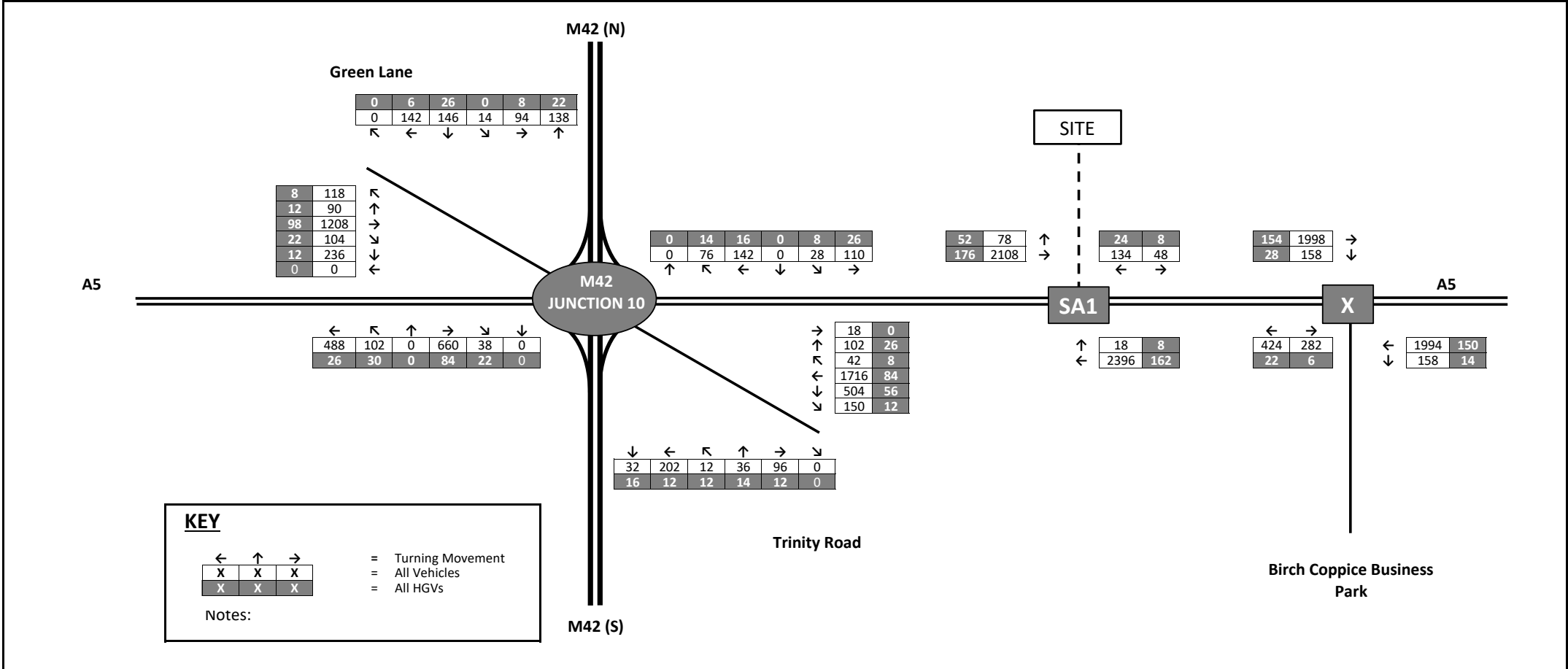
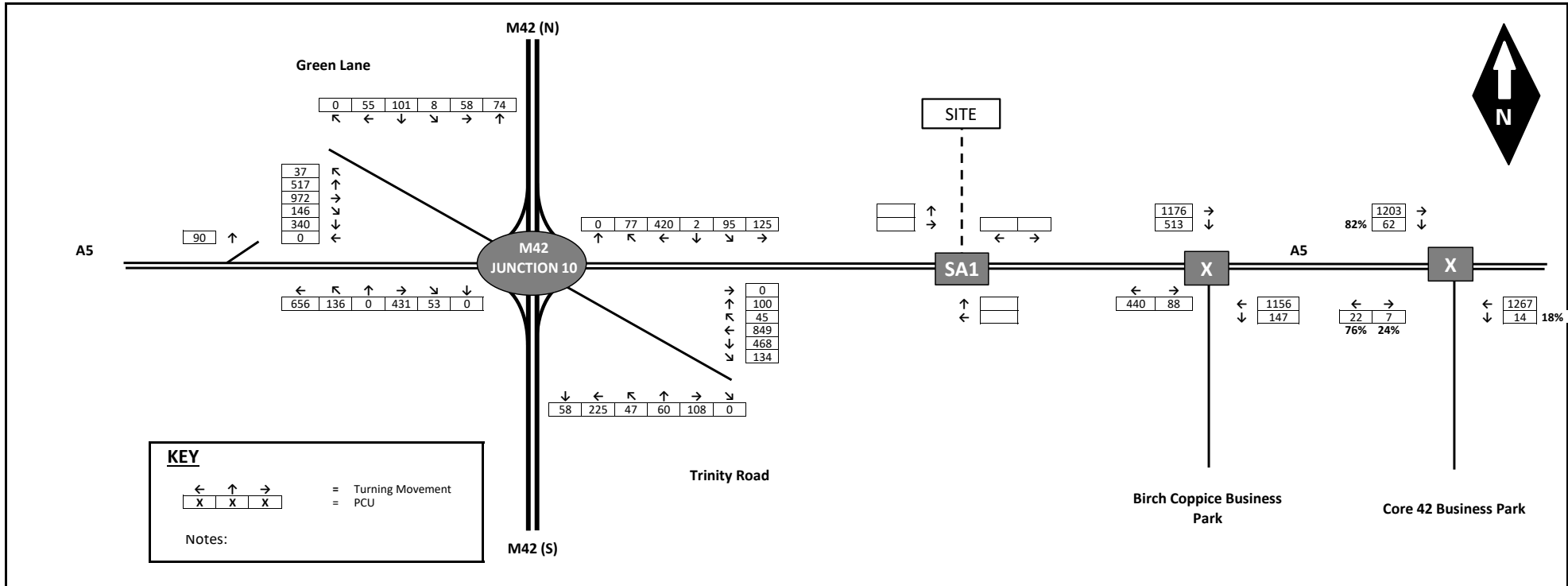
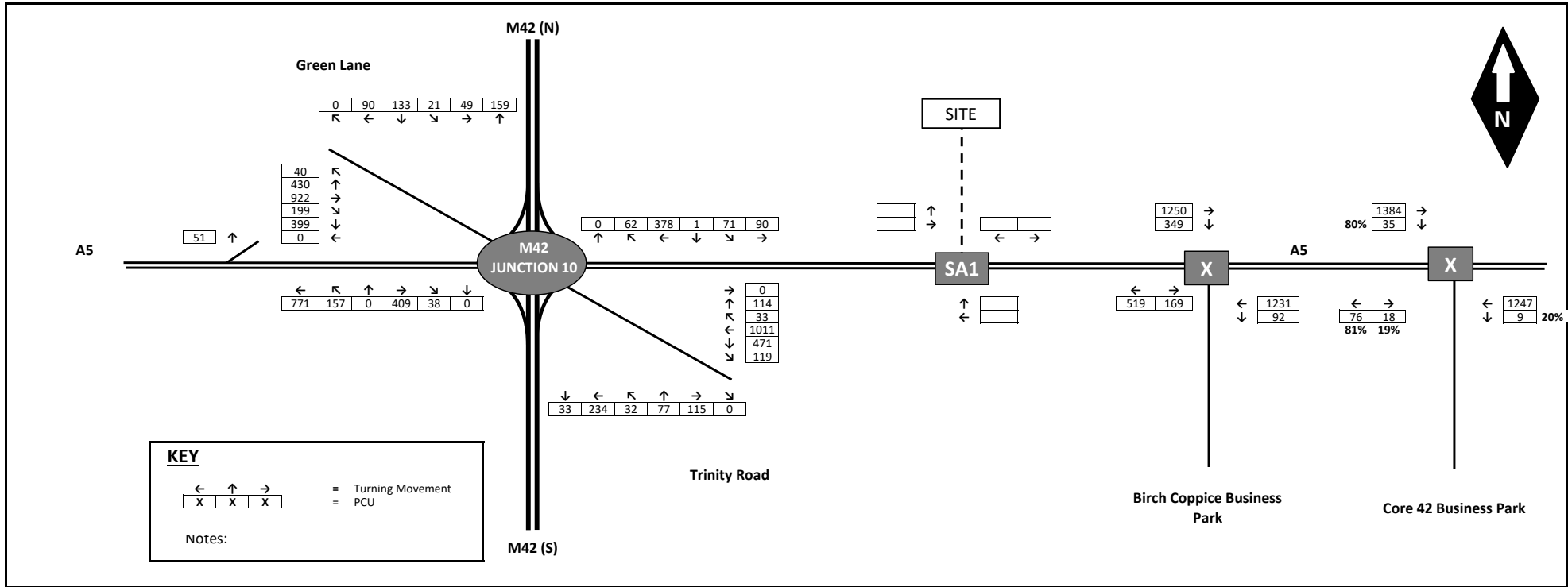


FIGURE 21
 2031 LOCAL PLAN + DEVELOPMENT - PM PEAK (1700 TO 1800) - DEMAND FLOWS
 LAND NORTH OF THE A5, DORDON

APPENDIX B

TT FIGURES



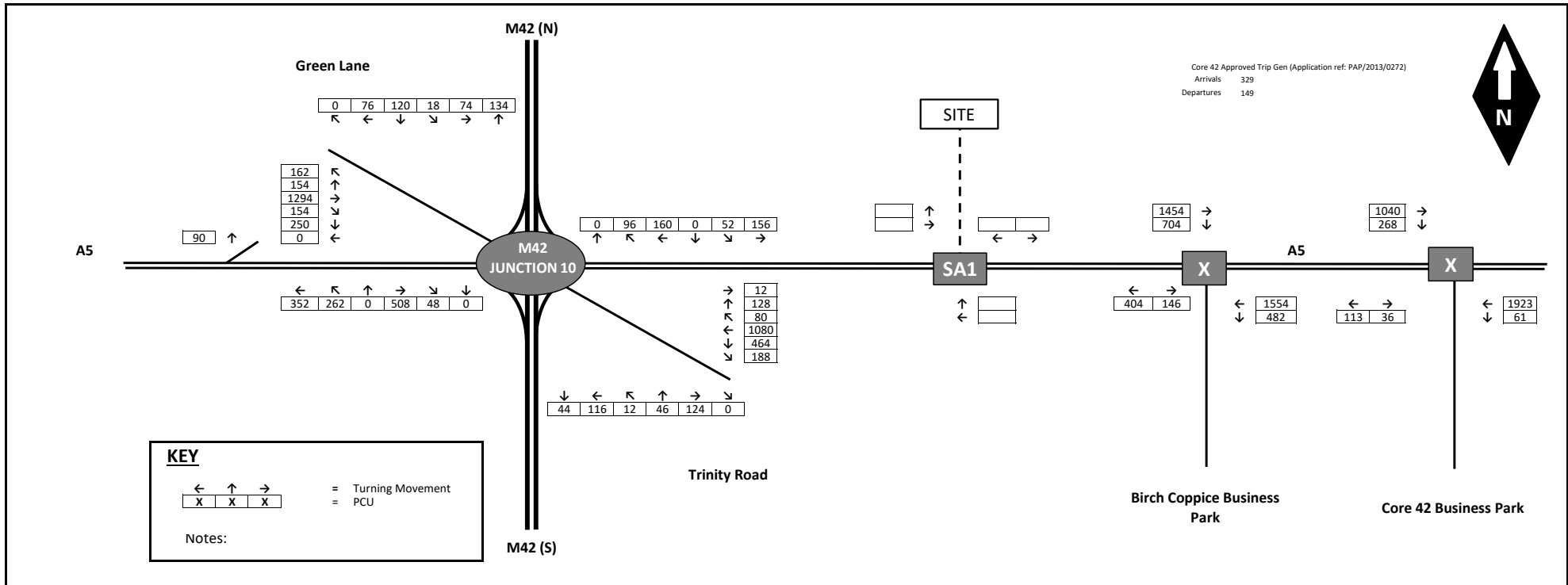


TT FIGURE 2
2022 PM PEAK (1600 TO 1700) - DEMAND FLOWS

Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH



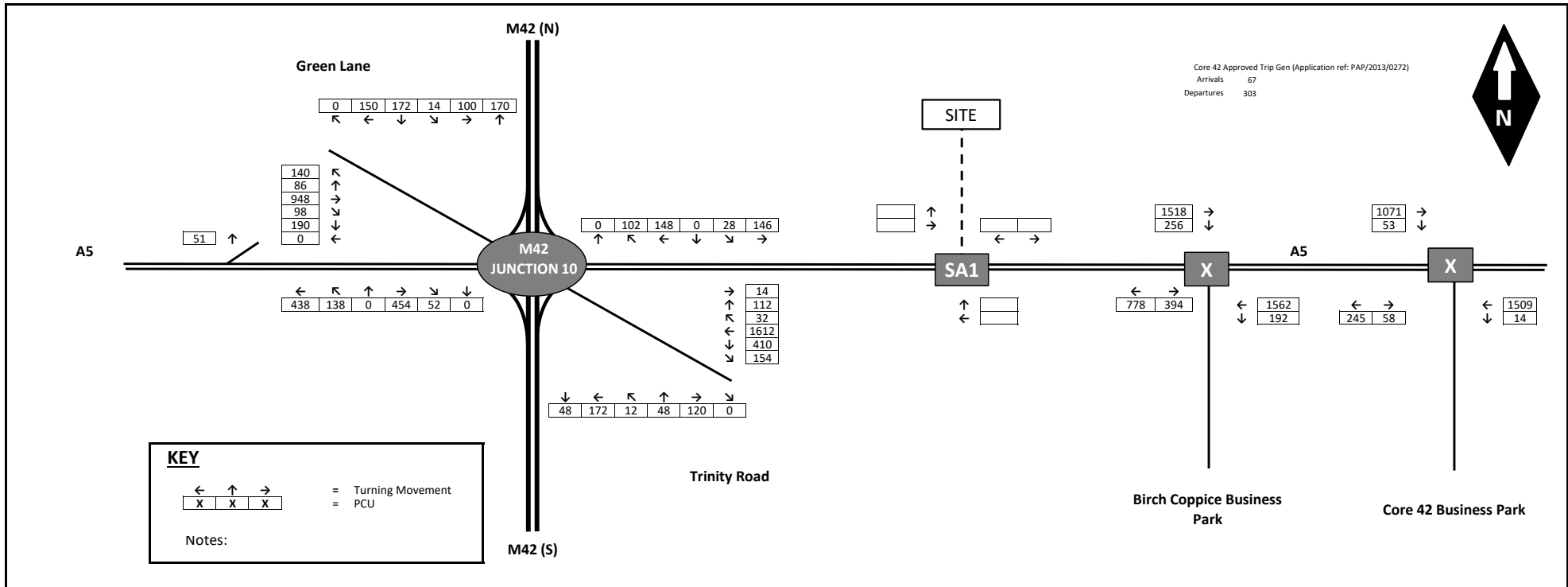
TT FIGURE 3
 2026 Reference Case AM Peak - DEMAND FLOWS

Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH





TT FIGURE 4

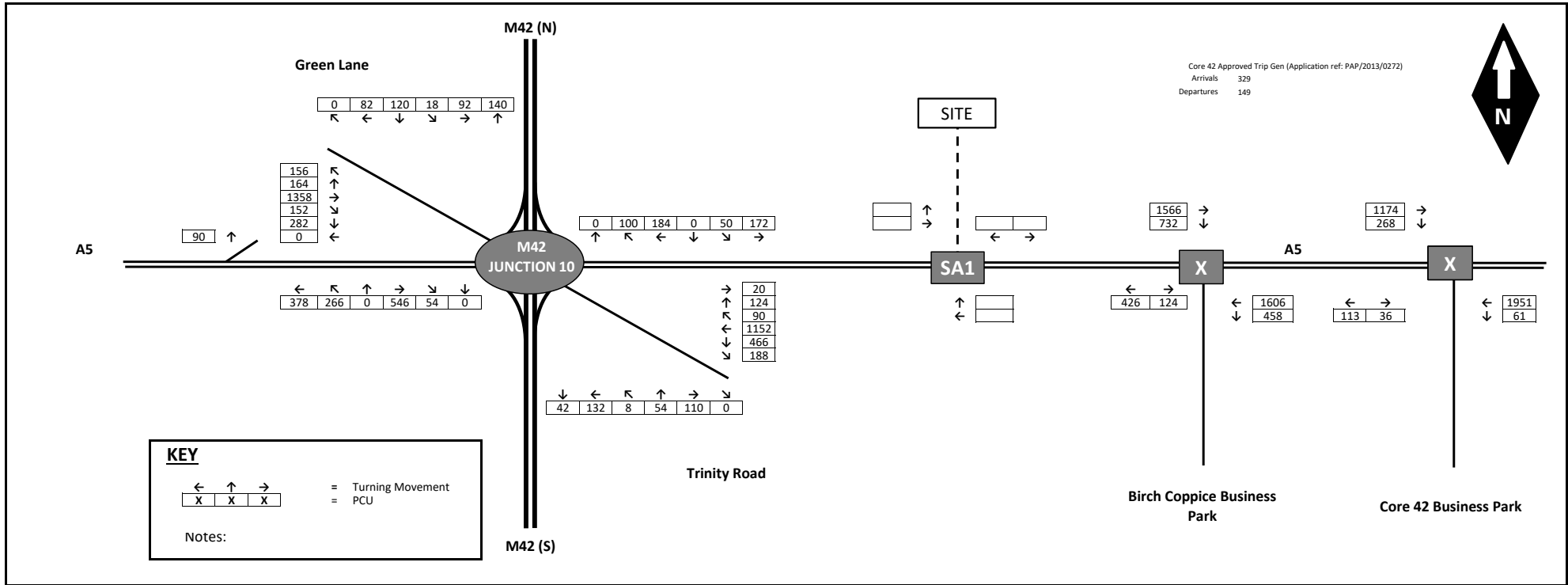
2026 Reference Case PM Peak - DEMAND FLOWS

Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH



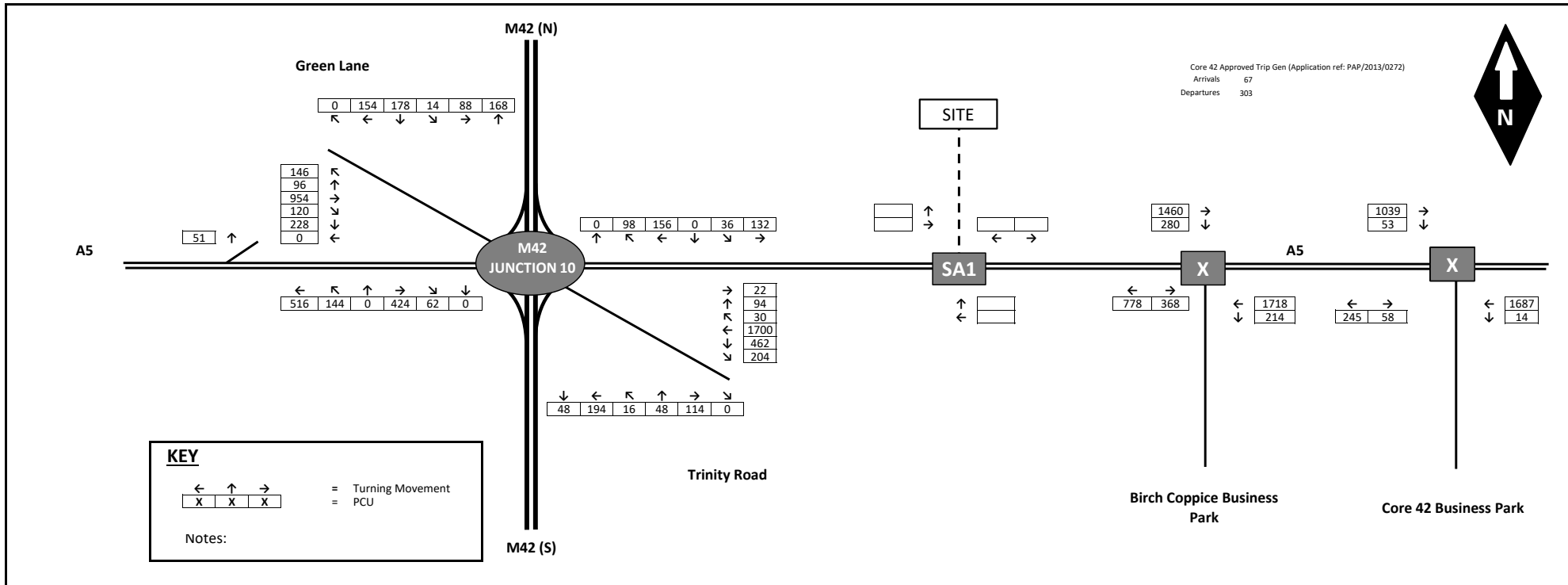


TT FIGURE 5
2031 Reference Case AM Peak - DEMAND FLOWS

Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH



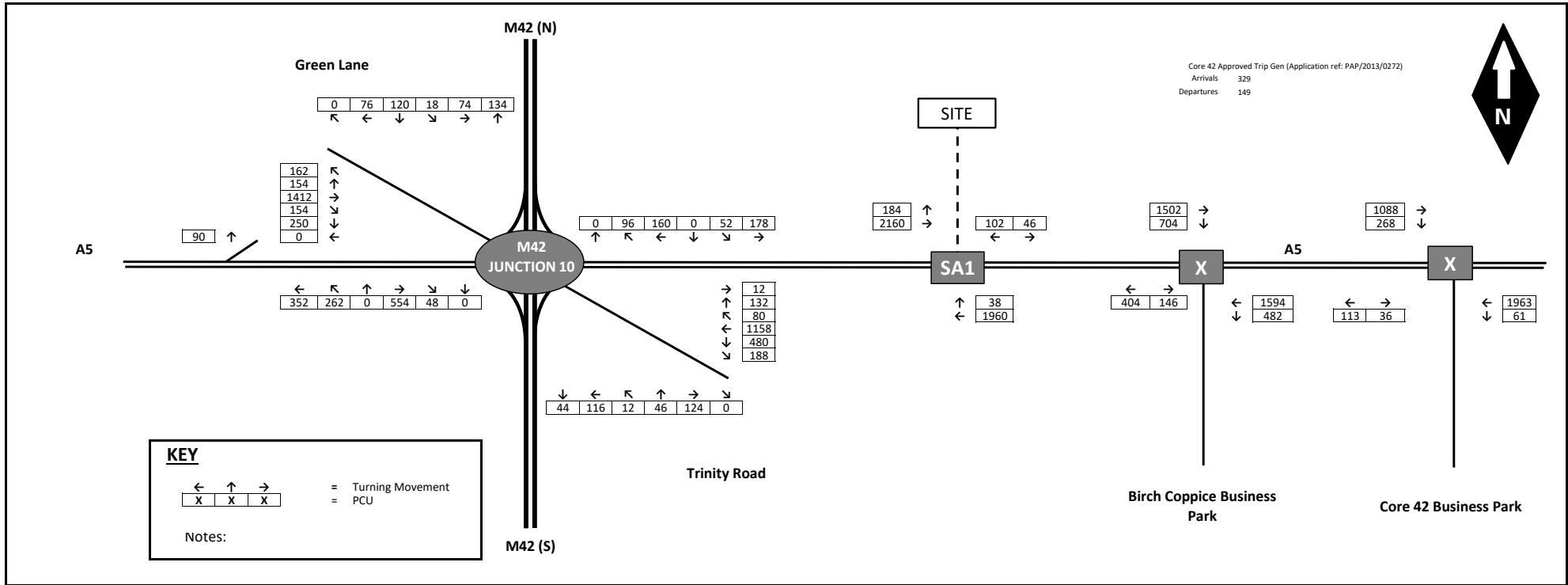
TT FIGURE 6
 2031 Reference Case PM Peak - DEMAND FLOWS



Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH



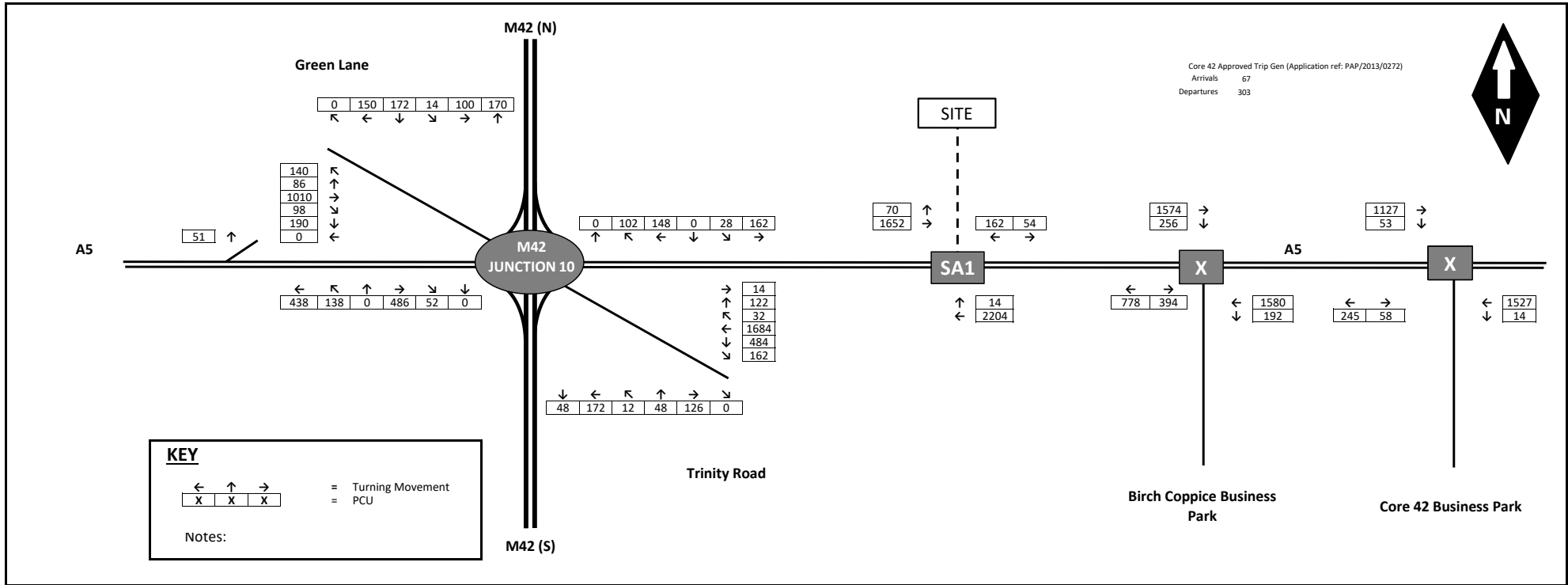
TT FIGURE 7
2026 Reference Case + Development AM Peak - DEMAND FLOWS



Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH

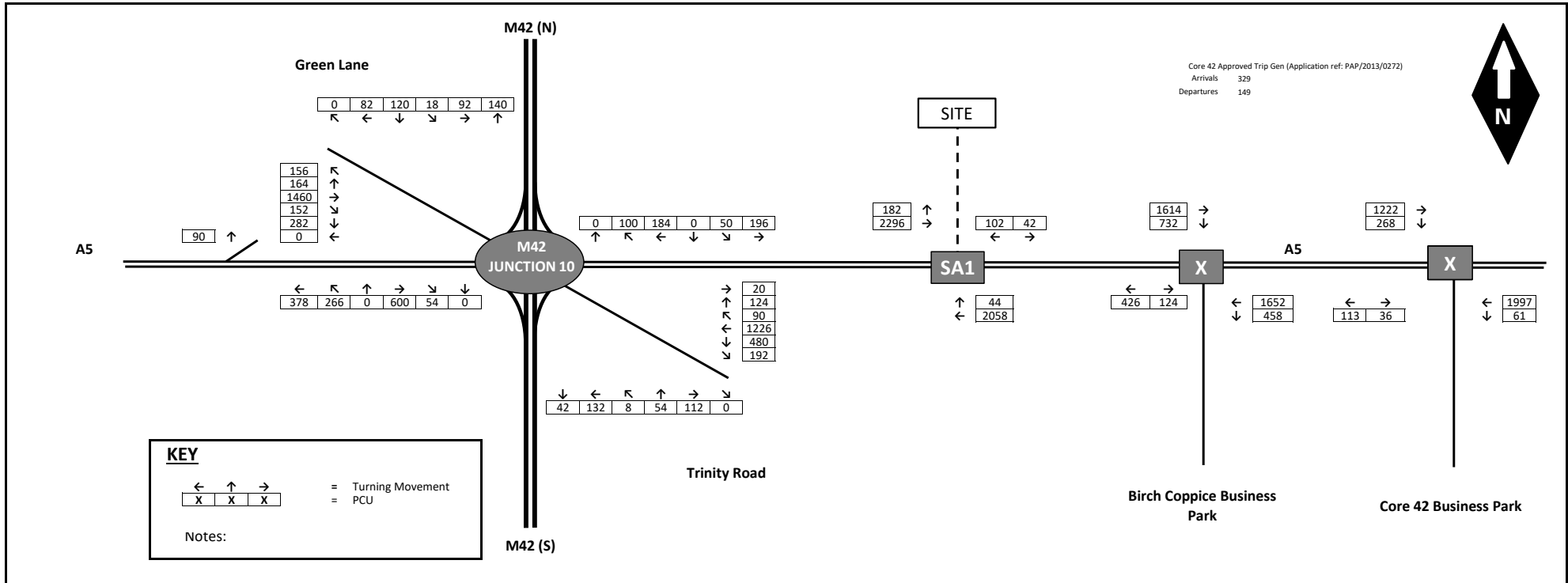


TT FIGURE 8
2026 Reference Case + Development PM Peak - DEMAND FLOWS

Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH



TT FIGURE 9

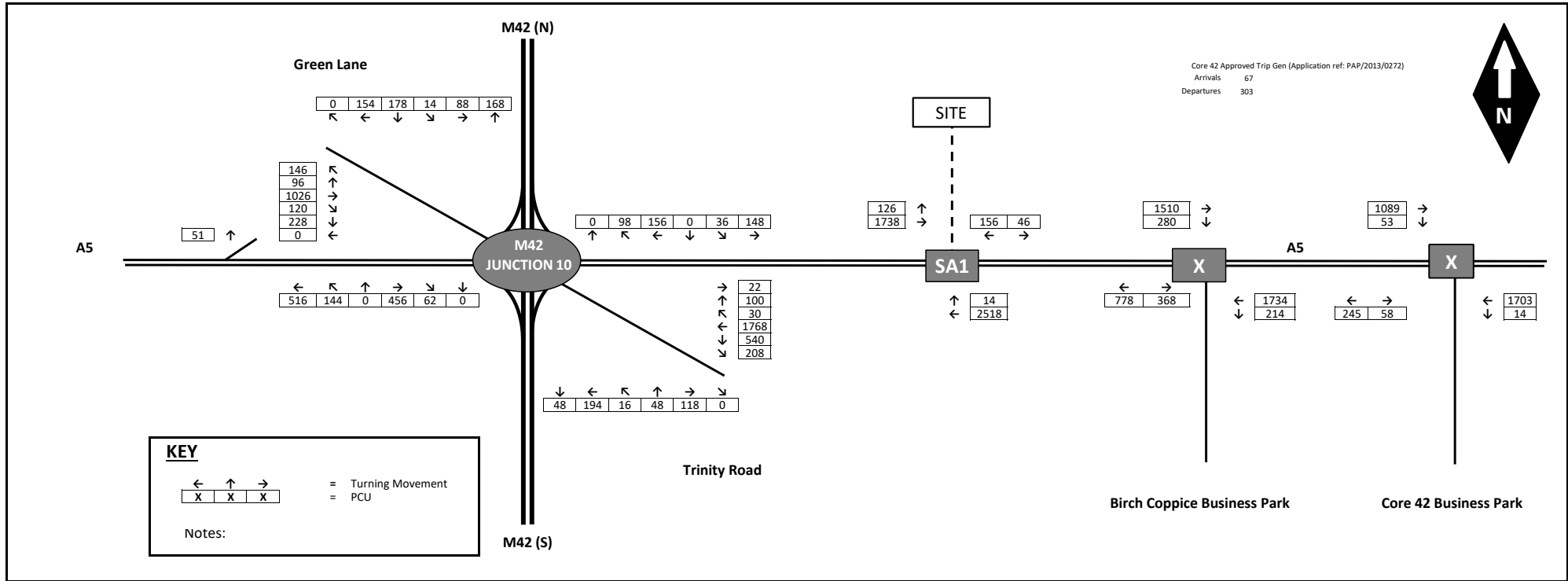
2031 Reference Case + Development AM Peak - DEMAND FLOWS

Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH



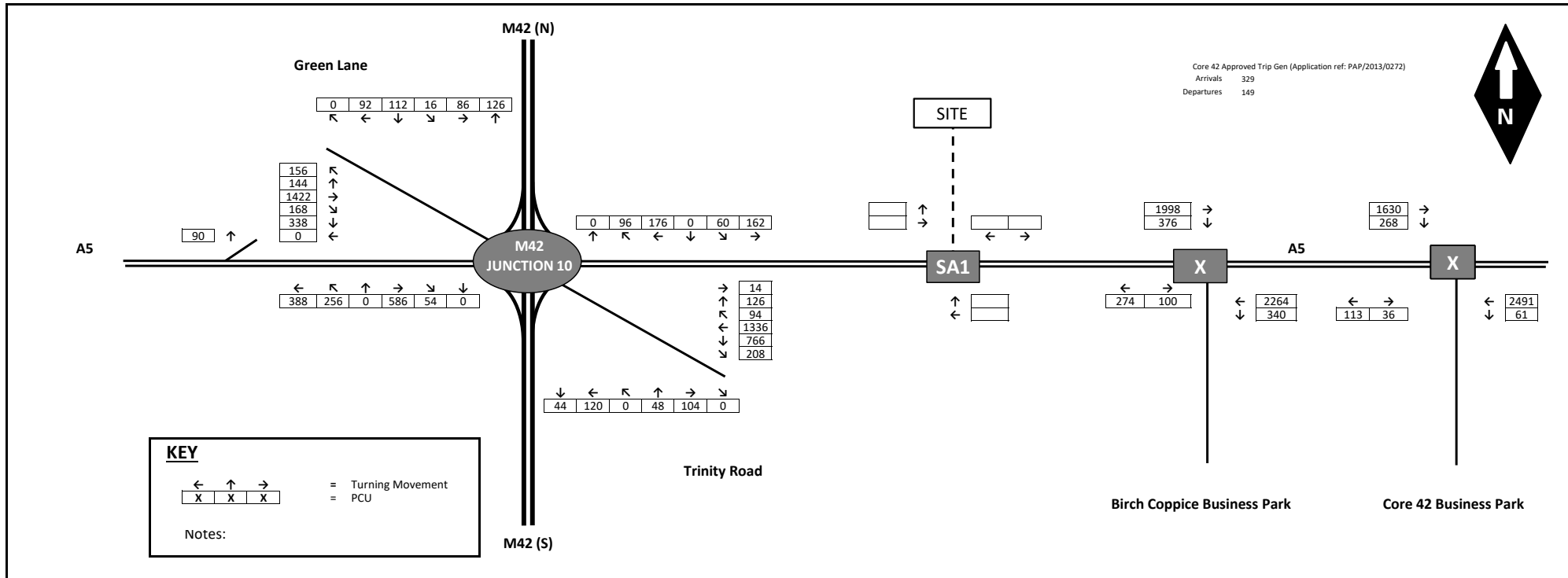


TT FIGURE 10
 2031 Reference + Development PM Peak - DEMAND FLOWS

Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH



TT FIGURE 11

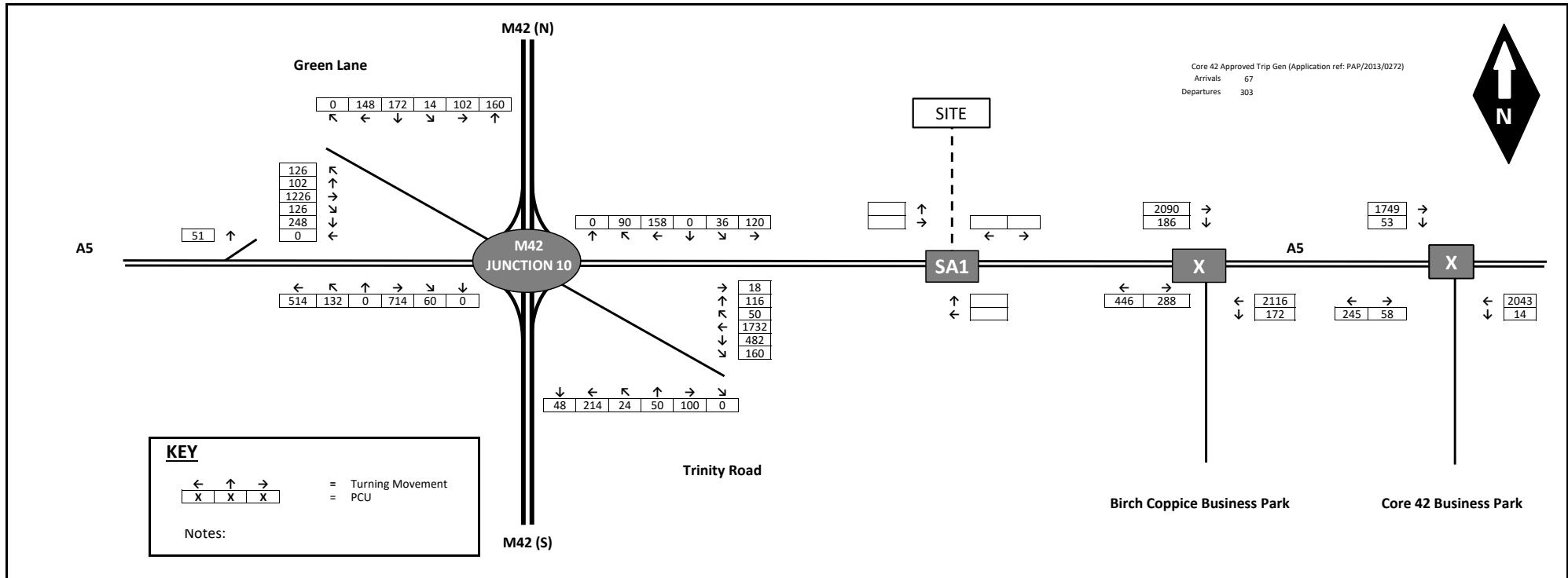
2031 Local Plan AM Peak - DEMAND FLOWS

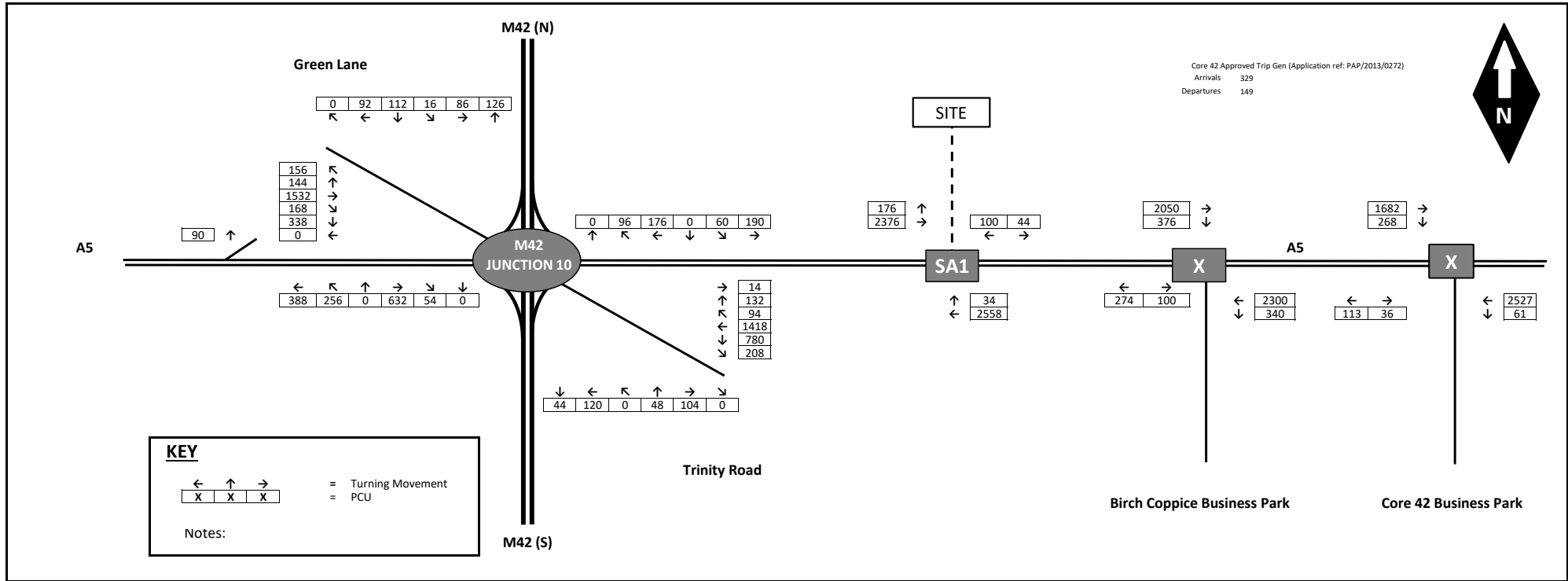
Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

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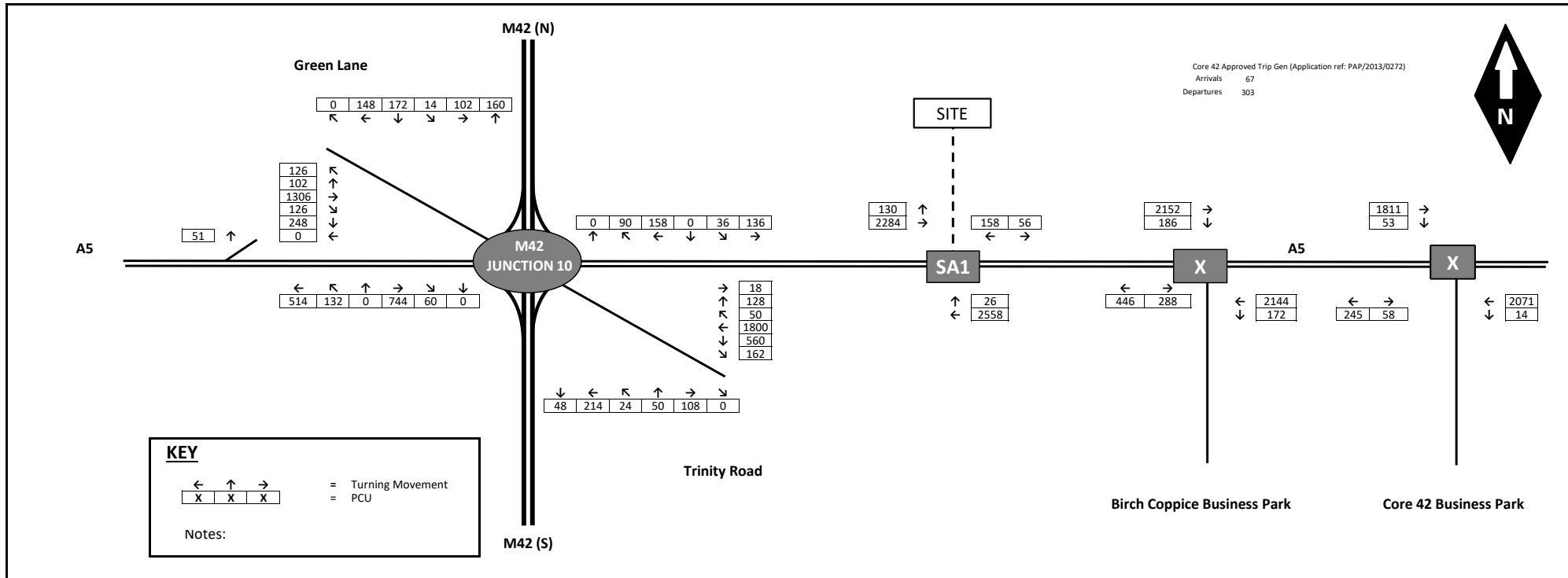


TT FIGURE 13
2031 Local Plan + Development AM Peak - DEMAND FLOWS

Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH



TT FIGURE 14
2031 Local Plan + Development PM Peak - DEMAND FLOWS

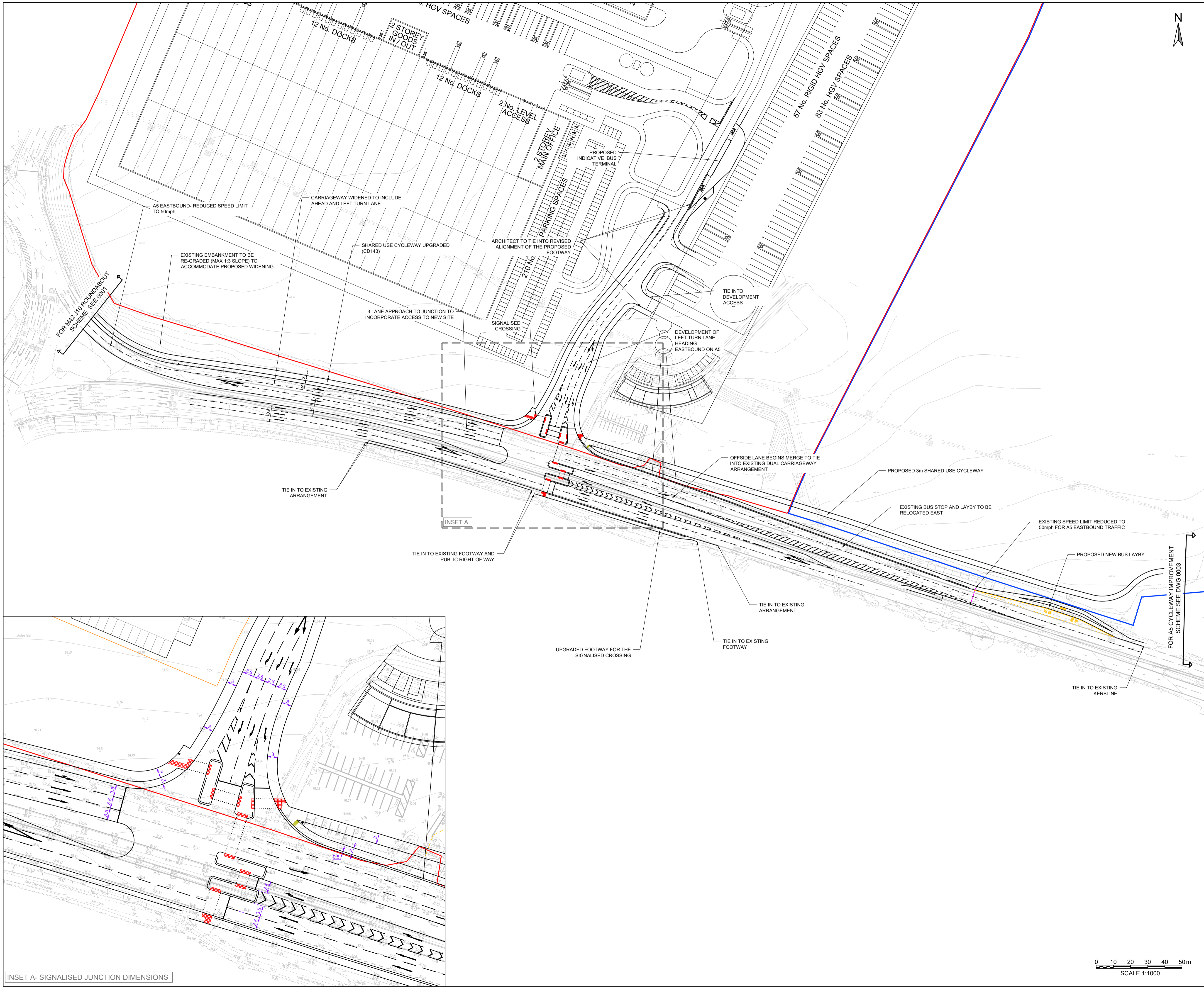
Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

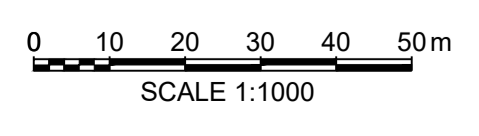
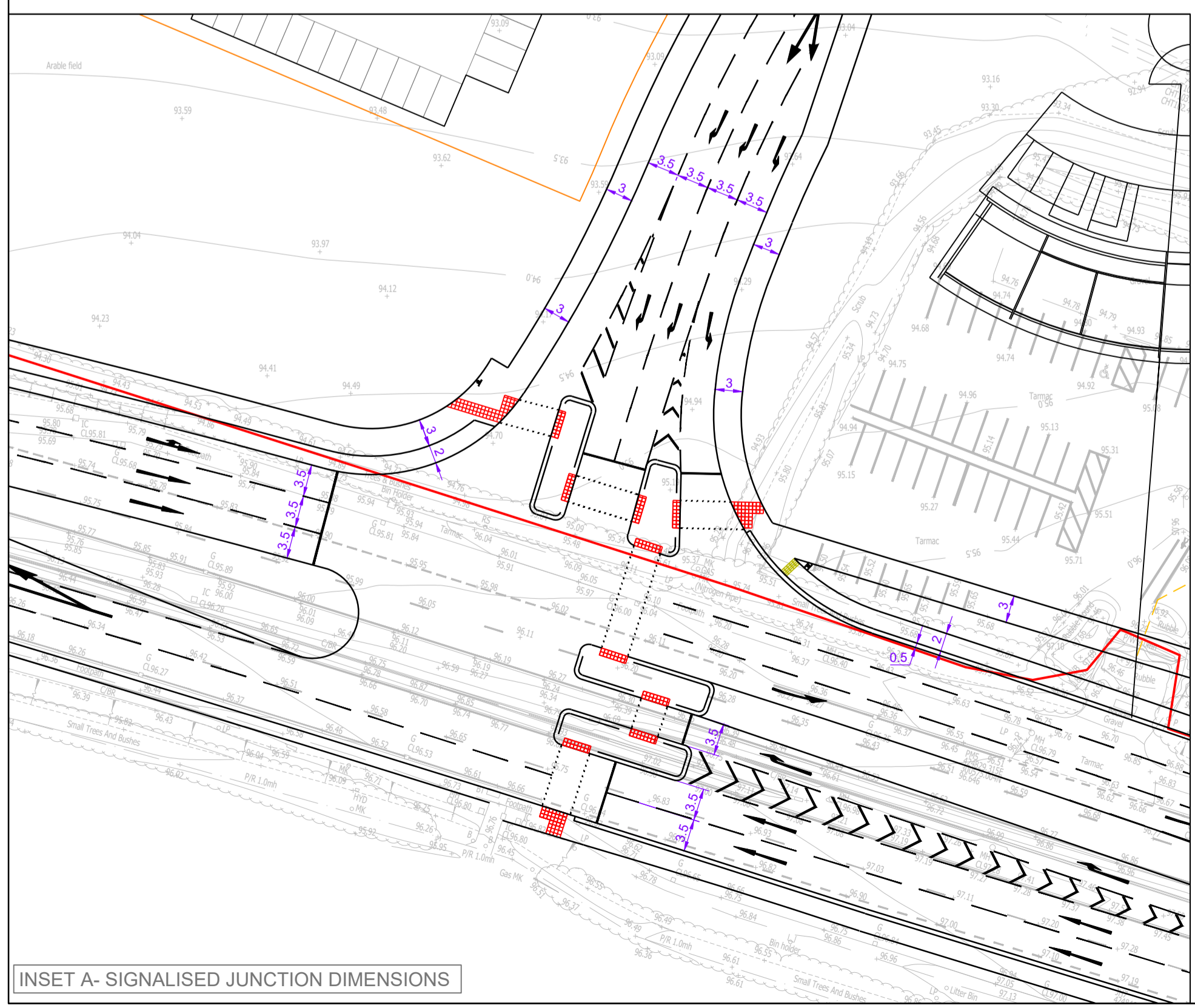
DRAWN BY: JH

APPENDIX C

DRAWINGS



- NOTES -**
- ALL DIMENSIONS IN METRES UNLESS STATED OTHERWISE.
 - THE INFORMATION SHOWN ON THIS DRAWING IS INTENDED TO PROVIDE A GENERAL OUTLINE OF THE HIGHWAY IMPROVEMENT WORKS.
- KEY:**
- SITE BOUNDARY 1
 - SITE BOUNDARY 2



PRELIMINARY ISSUE

Rev	Description	Date	Drn	CHK	App
P01	PRELIMINARY FIRST ISSUE	04.11.2022	LJB	LB	NB

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Tetra Tech Manchester
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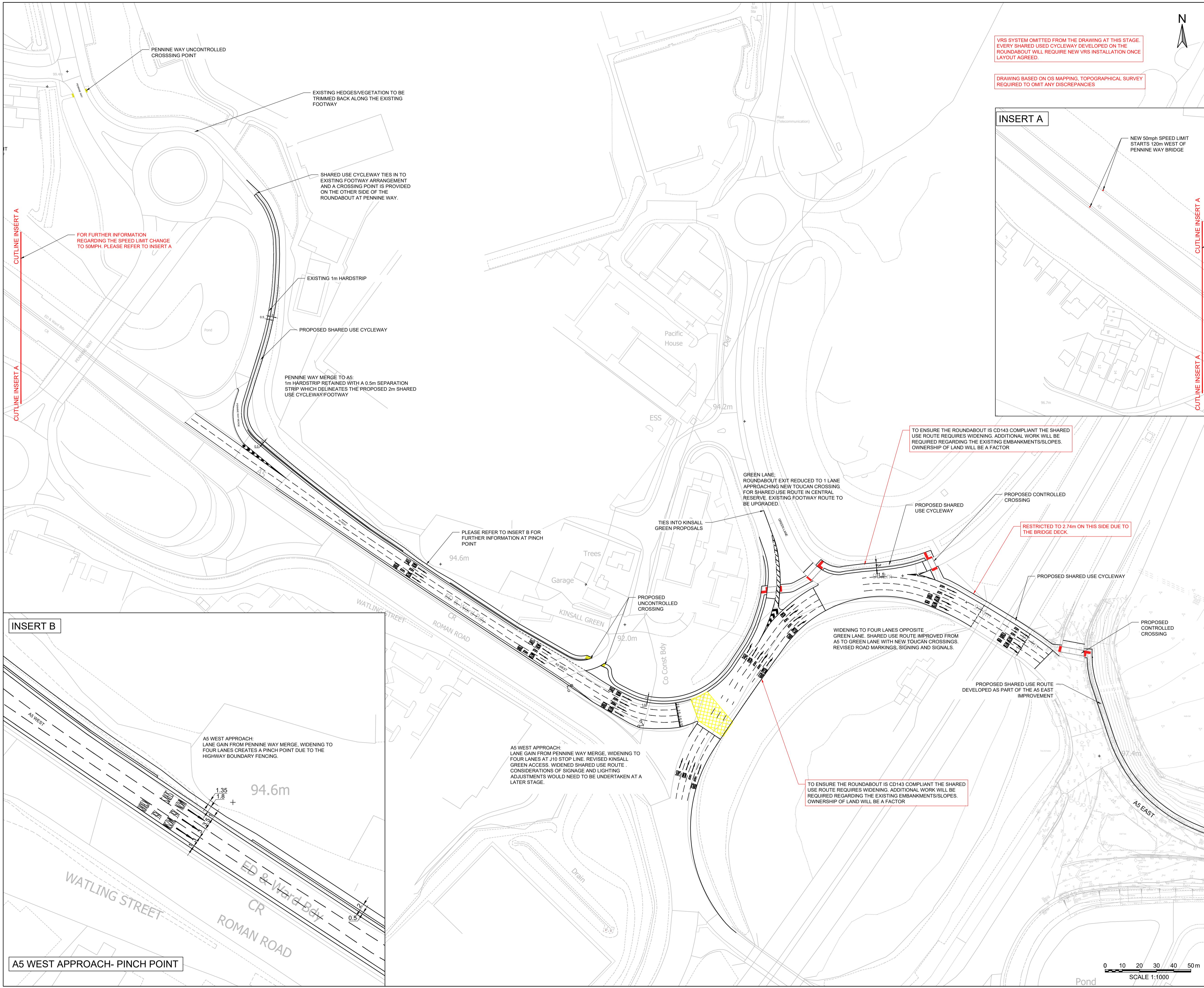


Client
HODGETTS ESTATES

Project Name
**M42 JUNCTION 10
 A5 CYCLEWAY IMPROVEMENT**

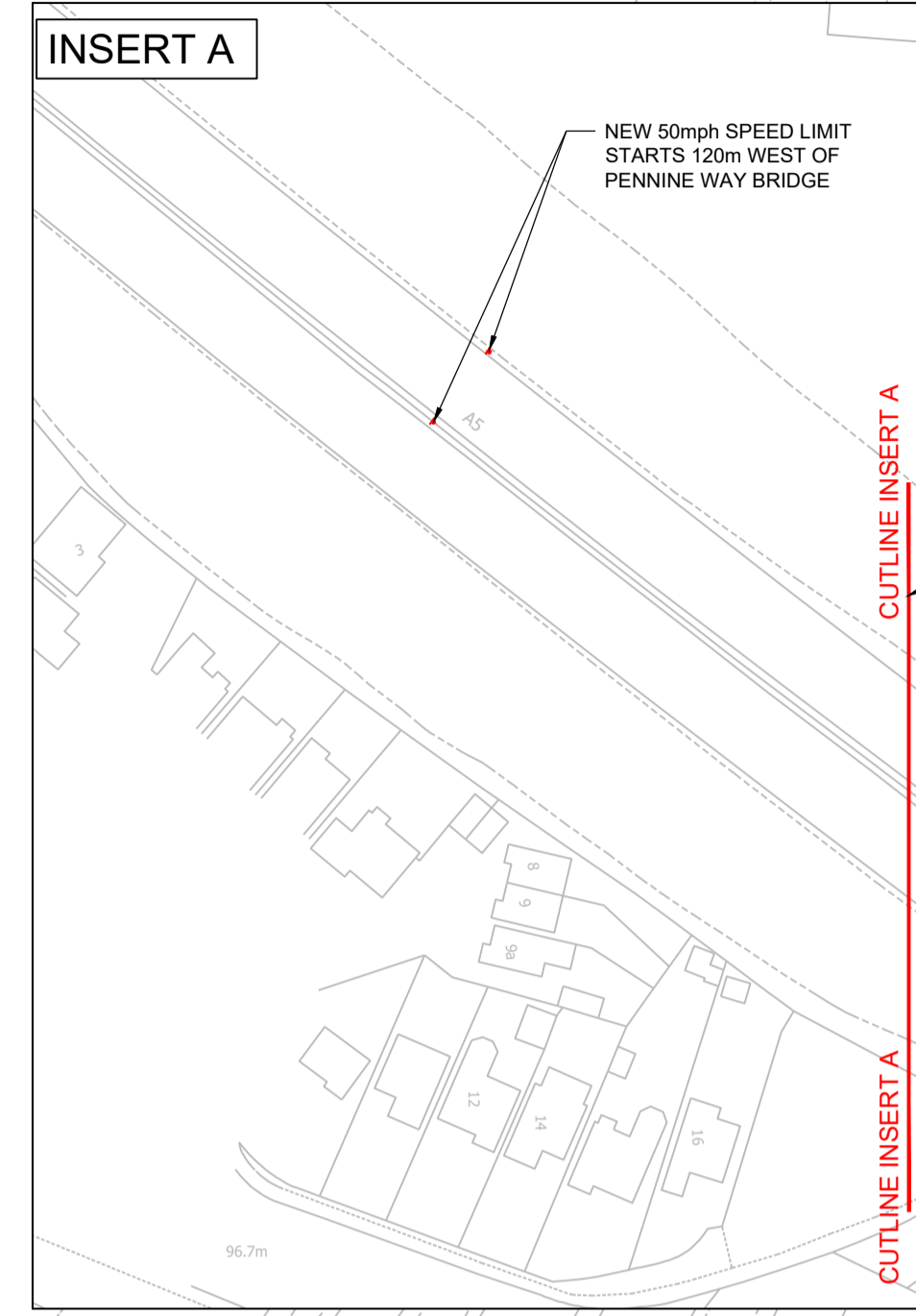
Sheet Title
**PROPOSED LAYOUT FOR A5 AND NEW SITE
 ACCESS**

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A1	Suitability
784-B033920	LJB	Oct'22	LB	Oct '22	NB	Oct '22	1:1000	S3
Client Project Number		Originator	Volume/System Level/Location	Type/Code	Role	Number	Revision	
B033920 - TTE		- 00	- ZZ	- PL	- H	- 0002	P01	



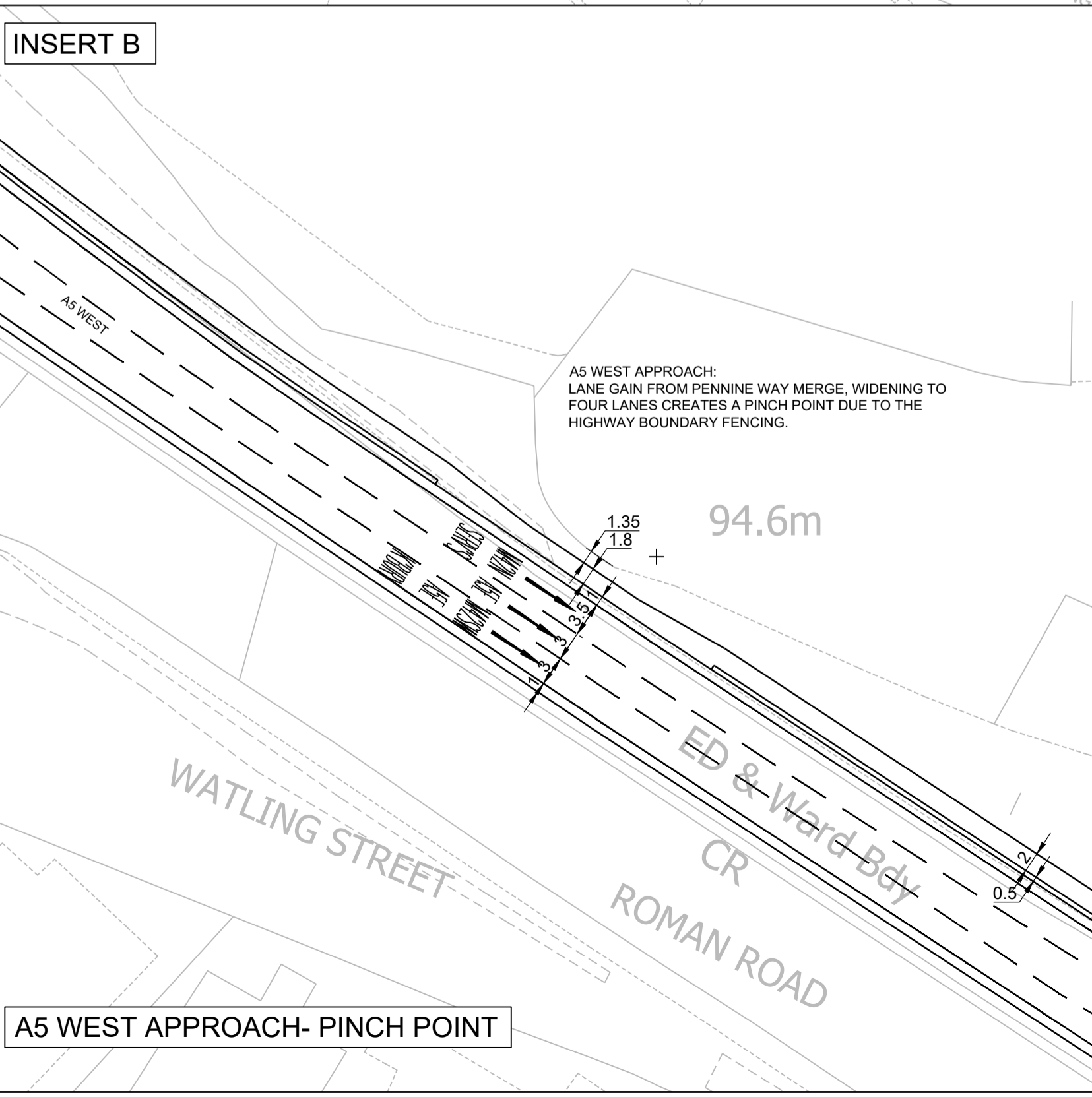
VRS SYSTEM OMITTED FROM THE DRAWING AT THIS STAGE. EVERY SHARED USE CYCLEWAY DEVELOPED ON THE ROUNDABOUT WILL REQUIRE NEW VRS INSTALLATION ONCE LAYOUT AGREED.

DRAWING BASED ON OS MAPPING, TOPOGRAPHICAL SURVEY REQUIRED TO OMIT ANY DISCREPANCIES



CUTLINE INSERT A

CUTLINE INSERT A



- THIS DRAWING SHOULD BE READ IN RELATION TO THE SUBJECT OF THE TITLE ONLY. OTHER INFORMATION SHOWN ON THE DRAWING IS TO BE CONSIDERED INDICATIVE ONLY. REFERENCE SHOULD BE MADE TO APPROPRIATE DRAWING SERIES/SPECIFICATIONS FOR OTHER INFORMATION.
- ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.

TO ENSURE THE ROUNDABOUT IS CD143 COMPLIANT THE SHARED USE ROUTE REQUIRES WIDENING. ADDITIONAL WORK WILL BE REQUIRED REGARDING THE EXISTING EMBANKMENTS/SLOPES. OWNERSHIP OF LAND WILL BE A FACTOR

RESTRICTED TO 2.74m ON THIS SIDE DUE TO THE BRIDGE DECK.

TO ENSURE THE ROUNDABOUT IS CD143 COMPLIANT THE SHARED USE ROUTE REQUIRES WIDENING. ADDITIONAL WORK WILL BE REQUIRED REGARDING THE EXISTING EMBANKMENTS/SLOPES. OWNERSHIP OF LAND WILL BE A FACTOR

PRELIMINARY ISSUE

P01	PRELIMINARY FIRST ISSUE	04.11.2022	LJB	LB	NB
Rev.	Description	Date	Drawn	Checked	Appr.

Issuing Office: Document Control

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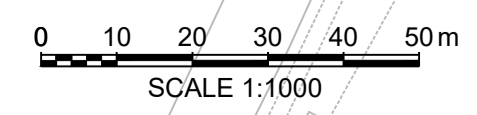
HODGETTS ESTATES

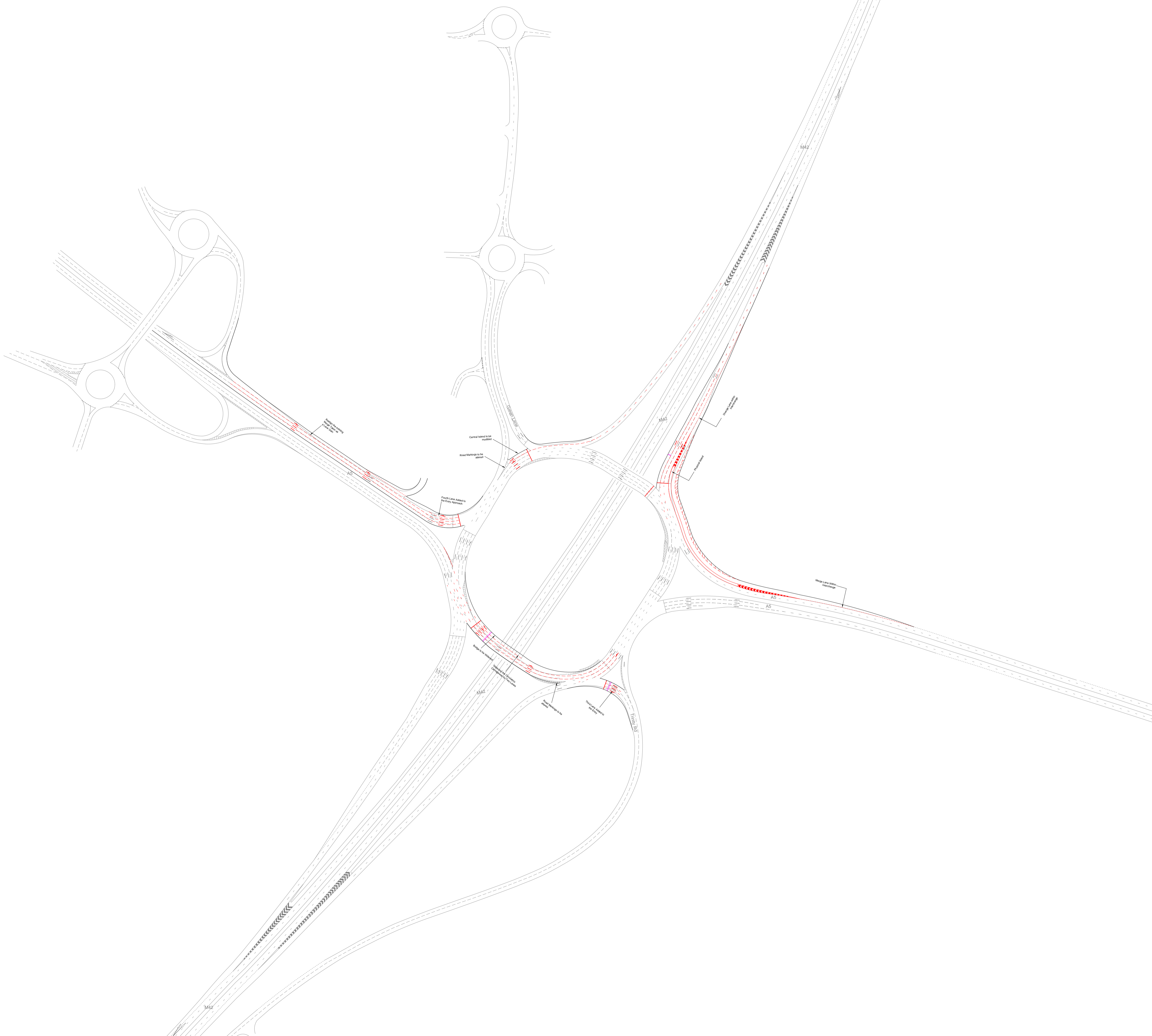
Project Name:
**M42 JUNCTION 10
 ROUNDABOUT IMPROVEMENT**

Sheet Title:
PROPOSED LAYOUT

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A1	Suitability
784-B033920	LJB	Sep'22	LB	Sep '22	NB	Sep '22	1:1000	S3
Client Project Number	Originator	Volume/System Level/Location	Type/Code	Role	Number	Revision		
B033920	TTE	- 00 - ZZ	- PL - H	- 0001	P01			

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Drawing Status:
 These drawings have been produced with reference to the CDM Regulations 2015, Regulation 9.

These Drawings are for planning approvals and are not to be used for construction purposes. It is the responsibility of the contractor and client to identify risks associated with the construction stage and to design appropriate measures to mitigate. The risks identified on the PJA Scheme Design Risk Assessment are based on the information available at the time of the design (drawing date) Where shown on PJA Design Drawings, the position of services is based on information provided by other parties at the time of the design and is for guidance only. It is the responsibility of the Client and Contractor to verify the exact position of any services before commencing works on site.

Client Duties:
 The client is directed to Regulation 4 of the CDM 2015 Regulations: Client duties in relation to managing projects

Rev / Date	Description	Drn	Chck'd
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Client
 Warwickshire County Council
 (WCC)

Project
 02853 M42 Junction 10

Drawing
 Indicative Solution.
 Level Intervention
 2 B+C+D+E+F

Drawn by: AH	24/08/2017	Scale:
Checked by: MN	24/08/2017	1:2000 @ A1

Drawing No.	Revision
02853 - 01	A

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APPENDIX D

TRANSYT SUMMARY RESULTS

Table 4.1: M42/ Junction 10 + A5/ Birch Coppice + A5/ Core 42, 2026 & 2031 Reference Case, AM Peak

				2026 AM Peak			2031 AM Peak		
M42 Junction 10									
Traffic Stream(s)	Lane	Saturation Flow pcu/hr	Model Output	No Dev	With Dev	With Dev Mitigation	No Dev	With Dev	With Dev Mitigation
1/1	M42 Northbound Offslip Lane 1	1740	Queue Aver Delay	3 23 secs	3 23 secs	3 23 secs	3 24 secs	3 24 secs	2 24 secs
1/2	M42 Northbound Offslip Lane 2	1740	Queue Aver Delay	2 23 secs	2 22 secs	2 23 secs	2 23 secs	2 22 secs	2 23 secs
1/3	M42 Northbound Offslip Lane 3	1740	Queue Aver Delay	2 22 secs	2 22 secs	1 22 secs	2 22 secs	2 23 secs	1 22 secs
3/1	M42 Northbound Offslip Lane 4	1849	Queue Aver Delay	10 36 secs	11 42 secs	14 50 secs	11 40 secs	13 47 secs	18 1m 5s
3/2	M42 Northbound Offslip Lane 5	1849	Queue Aver Delay	6 27 secs	7 29 secs	7 30 secs	7 28 secs	8 30 secs	9 33 secs
7/1	M42 Northbound Circulating Lane 1	2039	Queue Aver Delay	9 6 secs	8 6 secs	12 7 secs	10 6 secs	12 7 secs	17 9 secs
7/2	M42 Northbound Circulating Lane 2	1840	Queue Aver Delay	18 14 secs	24 19 secs	24 19 secs	24 19 secs	24 21 secs	27 24 secs
8/1 + 9/1 + 11/1	A5 Eastbound Lane 1	1828	Queue Aver Delay	55 3m 22s	107 6m 30s	3 10 secs	110 6m 14s	157 8m 53s	3 10 secs
8/2 + 9/2 + 11/2 + 63/1	A5 Eastbound Lane 2	1900	Queue Aver Delay	7 29 secs	7 31 secs	13 27 secs	8 31 secs	7 34 secs	18 44 secs
8/3 + 9/2 + 11/2 (9/3 + 11/3) + 63/2	A5 Eastbound Lane 3	1900	Queue Aver Delay	58 2m 36s	117 4m 59s	13 29 secs	82 3m 52s	145 6m 12s	18 43 secs
8/4	A5 Eastbound Lane 4	1900	Queue Aver Delay	N/A	N/A	4 14 secs	N/A	N/A	4 17 secs
12/1	A5 Eastbound Circulating Lane 1	1846	Queue Aver Delay	11 35 secs	11 35 secs	10 32 secs	10 35 secs	11 36 secs	10 32 secs
12/2	A5 Eastbound Circulating Lane 2	1878	Queue Aver Delay	11 32 secs	11 35 secs	2 15 secs	13 35 secs	11 37 secs	2 15 secs
12/3	A5 Eastbound Circulating Lane 3	1878	Queue Aver Delay	7 35 secs	8 35 secs	6 30 secs	9 35 secs	9 36 secs	7 30 secs
12/4	A5 Eastbound Circulating Lane 4	1878	Queue Aver Delay	1 33 secs	1 33 secs	10 39 secs	2 33 secs	2 33 secs	12 43 secs
14/1	Green Lane Lane 1	1602	Queue Aver Delay	11 2m 33s	12 2m 35s	11 2m 26s	21 4m 49s	23 4m 43s	22 4m 45s
14/2	Green Lane Lane 2	1602	Queue Aver Delay	15 3m 22s	15 3m 12s	14 3m 11s	18 3m 54s	15 3m 19s	16 3m 40s
15/1	Green Lane Circulating Lane 1	1950	Queue Aver Delay	12 7 secs	12 8 secs	3 6 secs	14 8 secs	12 8 secs	3 6 secs
15/2	Green Lane Circulating Lane 2	1745	Queue Aver Delay	14 12 secs	15 13 secs	9 8 secs	15 13 secs	15 13 secs	11 9 secs
15/3	Green Lane Circulating Lane 3	1745	Queue Aver Delay	2 4 secs	2 5 secs	14 10 secs	2 5 secs	2 5 secs	16 10 secs
15/4	Green Lane Circulating Lane 4	1745	Queue Aver Delay	N/A	N/A	1 3 secs	N/A	N/A	2 3 secs
13/1	Exit to Green Lane Toucan Crossing	2272	Queue Aver Delay	N/A	N/A	1 2 secs	N/A	N/A	1 2 secs
18/1	M42 Southbound Offslip Lane 1	1804	Queue Aver Delay	3 35 secs	4 38 secs	4 38 secs	3 36 secs	4 43 secs	5 42 secs
18/2	M42 Southbound Offslip Lane 2	1813	Queue Aver Delay	3 33 secs	3 33 secs	3 33 secs	4 35 secs	3 34 secs	3 34 secs
18/3	M42 Southbound Offslip Lane 3	1813	Queue Aver Delay	4 38 secs	4 37 secs	3 37 secs	4 41 secs	4 42 secs	4 40 secs
17/1	M42 Southbound Circulating Lane 1	1956	Queue Aver Delay	3 2 secs	3 2 secs	8 2 secs	3 2 secs	3 2 secs	10 3 secs
17/2	M42 Southbound Circulating Lane 2	1956	Queue Aver Delay	11 3 secs	11 3 secs	11 3 secs	13 3 secs	12 3 secs	12 3 secs
17/3	M42 Southbound Circulating Lane 3	1800	Queue Aver Delay	4 6 secs	5 6 secs	2 4 secs	6 5 secs	4 6 secs	2 4 secs
17/4	M42 Southbound Circulating Lane 4	1800	Queue Aver Delay	2 17 secs	2 17 secs	2 7 secs	2 16 secs	2 17 secs	3 7 secs
16/1	Exit to M42 Northbound Toucan Crossing	2200	Queue Aver Delay	N/A	N/A	1 2 secs	N/A	N/A	1 2 secs
23/1	A5 Westbound Lane 1	1930	Queue Aver Delay	8 14 secs	7 12 secs	6 10 secs	8 15 secs	7 12 secs	6 10 secs
23/2	A5 Westbound Lane 2	1851	Queue Aver Delay	3 12 secs	3 10 secs	4 9 secs	3 12 secs	3 10 secs	3 8 secs
23/3 + 24/2 + 25/2	A5 Westbound Lane 3	1851	Queue Aver Delay	14 48 secs	15 44 secs	12 25 secs	15 50 secs	22 1m 11s	12 28 secs
23/4 + 24/3 + 25/3	A5 Westbound Lane 4	1851	Queue Aver Delay	8 19 secs	14 35 secs	11 25 secs	10 40 secs	16 1m 2s	17 1m 1s
22/1	A5 Westbound Circulating Lane 1	1797	Queue Aver Delay	6 29 secs	6 27 secs	6 30 secs	7 30 secs	6 27 secs	8 39 secs
22/2	A5 Westbound Circulating Lane 2	1797	Queue Aver Delay	3 21 secs	3 20 secs	4 31 secs	3 22 secs	3 21 secs	4 35 secs

22/3	A5 Westbound Circulating Lane 3	1902	Queue Aver Delay	1 0 secs	1 0 secs	1 1 sec	1 0 secs	1 0 secs	1 4 secs
22/4	A5 Westbound Circulating Lane 4	1902	Queue Aver Delay	1 0 secs	1 1 sec	1 1 sec	1 1 sec	1 2 secs	2 3 secs
28/1 + 29/1	Trinity Road Lane 1	1669	Queue Aver Delay	3 29 secs	2 29 secs	3 32 secs	3 29 secs	2 29 secs	3 36 secs
28/2	Trinity Road Lane 2	1669	Queue Aver Delay	4 31 secs	4 31 secs	4 34 secs	3 31 secs	4 31 secs	4 41 secs
27/1	Trinity Road Circulating Lane 1	1846	Queue Aver Delay	6 9 secs	6 7 secs	4 6 secs	5 9 secs	5 8 secs	3 6 secs
27/2	Trinity Road Circulating Lane 2	1846	Queue Aver Delay	5 6 secs	5 5 secs	6 7 secs	5 6 secs	3 5 secs	5 7 secs
27/3	Trinity Road Circulating Lane 3	1878	Queue Aver Delay	9 4 secs	10 4 secs	9 4 secs	10 5 secs	11 5 secs	11 4 secs
27/4	Trinity Road Circulating Lane 4	1878	Queue Aver Delay	8 7 secs	13 9 secs	12 8 secs	11 10 secs	14 11 secs	15 12 secs
A5/ Site Access									
56/1	A5 Eastbound Left Turn Lane 1	1751	Queue Aver Delay	N/A	15 15 secs	18 21 secs	N/A	16 16 secs	20 25 secs
56/2 + 21/1	A5 Eastbound Lane 2	1814	Queue Aver Delay	N/A	14 14 secs	19 19 secs	N/A	15 14 secs	22 23 secs
53/3 + 21/2	A5 Eastbound Lane 3	2082	Queue Aver Delay	N/A	5 7 secs	6 8 secs	N/A	5 7 secs	6 9 secs
59/2 + 62/1 + 61/1 + 39/1	A5 Westbound Lane 1	2015	Queue Aver Delay	N/A	4 15 secs	1 23 secs	N/A	7 20 secs	5 15 secs
59/3 + 62/2 + 61/2 + 39/2	A5 Westbound Lane 2	2015	Queue Aver Delay	N/A	4 15 secs	1 27 secs	N/A	6 22 secs	6 17 secs
60/1	A5 Westbound Right Turn Lane 3	1667	Queue Aver Delay	N/A	2 1m 5s	1 26 secs	N/A	2 1m 4s	2 1m 4s
54/1	Site Access Left Turn Lane 1	1695	Queue Aver Delay	N/A	1 23 secs	3 12 secs	N/A	1 23 secs	1 23 secs
55/1	Site Access Right Turn Lane 2	1690	Queue Aver Delay	N/A	1 28 secs	3 12 secs	N/A	1 30 secs	1 28 secs
55/2	Site Access Right Turn Lane 3	1690	Queue Aver Delay	N/A	1 28 secs	2 1m 4s	N/A	1 30 secs	1 28 secs
A5/ Birch Coppice									
31/1	A5 Eastbound Ahead Lane 1	1814	Queue Aver Delay	7 5 secs	5 7 secs	3 8 secs	7 5 secs	4 8 secs	4 9 secs
31/2	A5 Eastbound Ahead Lane 2	2082	Queue Aver Delay	3 2 secs	1 3 secs	1 4 secs	2 2 secs	2 4 secs	2 4 secs
32/1	A5 Eastbound Right Turn Lane 3	1960	Queue Aver Delay	10 42 secs	9 36 secs	11 47 secs	9 42 secs	8 36 secs	11 51 secs
32/2	A5 Eastbound Right Turn Lane 4	1667	Queue Aver Delay	7 41 secs	7 37 secs	9 48 secs	7 41 secs	5 36 secs	9 46 secs
37/1	A5 Westbound Left Turn Lane 1	1751	Queue Aver Delay	5 16 secs	6 16 secs	5 16 secs	6 16 secs	5 15 secs	4 15 secs
37/2 + 38/1 + 53/1	A5 Westbound Ahead Lane 2	2015	Queue Aver Delay	9 26 secs	9 19 secs	9 20 secs	9 27 secs	9 20 secs	9 21 secs
37/3 + 38/2 + 53/2	A5 Westbound Ahead Lane 3	2015	Queue Aver Delay	9 26 secs	9 20 secs	9 20 secs	9 27 secs	9 21 secs	9 21 secs
42/1	Birch Coppice Left Turn Lane 1	1695	Queue Aver Delay	6 40 secs	5 42 secs	6 40 secs	7 47 secs	6 43 secs	6 44 secs
42/2	Birch Coppice Left Turn Lane 2	1983	Queue Aver Delay	3 30 secs	3 31 secs	3 30 secs	4 31 secs	4 31 secs	3 31 secs
43/1 + 44/2	Birch Coppice Right Turn Lane 3	1690	Queue Aver Delay	5 1m 23s	5 1m 24s	5 1m 16s	3 52 secs	4 57 secs	3 56 secs
A5/ Core 42									
46/1 + 45/1	A5 Eastbound Ahead Lane 1	1833	Queue Aver Delay	1 4 secs	1 4 secs	2 5 secs	1 4 secs	1 4 secs	2 5 secs
46/2 + 45/2	A5 Eastbound Ahead Lane 2	2082	Queue Aver Delay	1 2 secs	1 2 secs	1 2 secs	1 2 secs	1 2 secs	1 2 secs
47/1	A5 Eastbound Right Turn Lane 3	1667	Queue Aver Delay	7 48 secs	6 42 secs	9 1 min	5 41 secs	5 35 secs	8 49 secs
49/1	A5 Westbound Ahead & Left Turn Lane 1	1957	Queue Aver Delay	22 33 secs	25 39 secs	24 3 secs	21 32 secs	27 38 secs	28 47 secs
49/2	A5 Westbound Ahead Lane 2	1909	Queue Aver Delay	27 46 secs	34 58 secs	32 58 secs	30 53 secs	36 1m 5s	35 1m 8s
51/1	Core 42 Left Turn Lane 1	1695	Queue Aver Delay	1 22 secs	1 22 secs	1 22 secs	1 22 secs	1 22 secs	1 21 secs
52/1	Core 42 Right Turn Lane 2	1690	Queue Aver Delay	2 1m 44s	2 1m 45s	2 1m 43s	2 1m 42s	2 1m 45s	2 1m 43s
			Network PI	6195.22	8495.28	5380.73	7840.38	10250.89	6511.17

= new traffic streams as a result of the proposed development site access junction

= new traffic streams as a result of proposed off-site mitigation improvements

Table 4.2: M42/ Junction 10 + A5/ Birch Coppice + A5/ Core 42, 2026 & 2031 Reference Case, PM Peak

				2026 PM Peak			2031 PM Peak		
M42 Junction 10									
Traffic Stream(s)	Lane	Saturation Flow pcu/hr	Model Output	No Dev	With Dev	With Dev Mitigation	No Dev	With Dev	With Dev Mitigation
1/1	M42 Northbound Offslip Lane 1	1740	Queue Aver Delay	4 36 secs	4 36 secs	4 37 secs	6 45 secs	6 42 secs	6 45 secs
1/2	M42 Northbound Offslip Lane 2	1740	Queue Aver Delay	3 32 secs	3 32 secs	3 33 secs	4 34 secs	4 35 secs	4 34 secs
1/3	M42 Northbound Offslip Lane 3	1740	Queue Aver Delay	2 30 secs	2 30 secs	2 30 secs	2 30 secs	3 31 secs	2 30 secs
3/1	M42 Northbound Offslip Lane 4	1849	Queue Aver Delay	15 2mins	18 2m 20s	18 2m 35s	14 1m 37s	14 2m 6s	16 2m 16s
3/2	M42 Northbound Offslip Lane 5	1849	Queue Aver Delay	16 2m 10s	23 3m 9s	21 2m 54s	15 2m 1s	16 2m 15s	20 2m 40s
7/1	M42 Northbound Circulating Lane 1	2039	Queue Aver Delay	23 8 secs	22 7 secs	23 7 secs	25 9 secs	23 8 secs	24 8 secs
7/2	M42 Northbound Circulating Lane 2	1840	Queue Aver Delay	25 10 secs	27 11 secs	27 11 secs	25 10 secs	26 10 secs	26 11 secs
8/1 + 9/1 + 11/1	A5 Eastbound Lane 1	1828	Queue Aver Delay	14 45 secs	27 1m 32s	3 12 secs	12 30 secs	18 1m 10s	3 12 secs
8/2 + 9/2 + 11/2	A5 Eastbound Lane 2	1900	Queue Aver Delay	6 22 secs	12 49 secs	8 16 secs	6 19 secs	7 26 secs	8 16 secs
8/3 + 9/2 + 11/2 (9/3 + 11/3)	A5 Eastbound Lane 3	1900	Queue Aver Delay	6 22 secs	4 17 secs	6 15 secs	9 20 secs	8 35 secs	6 15 secs
8/4	A5 Eastbound Lane 4	1900	Queue Aver Delay	N/A	N/A	4 12 secs	N/A	N/A	5 13 secs
12/1	A5 Eastbound Circulating Lane 1	1846	Queue Aver Delay	5 23 secs	5 23 secs	5 23 secs	5 24 secs	6 24 secs	5 24 secs
12/2	A5 Eastbound Circulating Lane 2	1878	Queue Aver Delay	7 31 secs	8 32 secs	3 14 secs	7 32 secs	7 32 secs	2 15 secs
12/3	A5 Eastbound Circulating Lane 3	1878	Queue Aver Delay	7 40 secs	7 40 secs	6 37 secs	7 39 secs	7 40 secs	5 37 secs
12/4	A5 Eastbound Circulating Lane 4	1878	Queue Aver Delay	1 36 secs	1 36 secs	8 41 secs	1 37 secs	1 36 secs	9 41 secs
14/1	Green Lane Lane 1	1602	Queue Aver Delay	7 36 secs	7 37 secs	7 38 secs	4 34 secs	6 34 secs	6 35 secs
14/2	Green Lane Lane 2	1602	Queue Aver Delay	12 1m 16s	12 1m 11s	12 1m 19s	13 1m 33s	14 1m 35s	14 1m 30s
15/1	Green Lane Circulating Lane 1	1950	Queue Aver Delay	12 11 secs	12 12 secs	4 10 secs	10 10 secs	12 11 secs	3 9 secs
15/2	Green Lane Circulating Lane 2	1745	Queue Aver Delay	15 14 secs	16 16 secs	9 10 secs	13 13 secs	16 15 secs	8 10 secs
15/3	Green Lane Circulating Lane 3	1745	Queue Aver Delay	2 6 secs	2 8 secs	12 12 secs	2 6 secs	3 8 secs	11 11 secs
15/4	Green Lane Circulating Lane 4	1745	Queue Aver Delay	N/A	N/A	2 4 secs	N/A	N/A	2 5 secs
13/1	Exit to Green Lane Toucan Crossing	2272	Queue Aver Delay	N/A	N/A	1 10 secs	N/A	N/A	1 10 secs
18/1	M42 Southbound Offslip Lane 1	1804	Queue Aver Delay	2 19 secs	3 19 secs	3 20 secs	2 20 secs	2 19 secs	2 19 secs
18/2	M42 Southbound Offslip Lane 2	1813	Queue Aver Delay	2 18 secs	2 19 secs	2 19 secs	2 19 secs	2 21 secs	2 19 secs
18/3	M42 Southbound Offslip Lane 3	1813	Queue Aver Delay	3 20 secs	3 20 secs	3 20 secs	3 20 secs	3 20 secs	3 20 secs
17/1	M42 Southbound Circulating Lane 1	1956	Queue Aver Delay	11 11 secs	12 12 secs	16 11 secs	10 10 secs	11 11 secs	17 10 secs
17/2	M42 Southbound Circulating Lane 2	1956	Queue Aver Delay	18 8 secs	18 8 secs	18 11 secs	16 8 secs	18 8 secs	17 11 secs
17/3	M42 Southbound Circulating Lane 3	1800	Queue Aver Delay	7 16 secs	8 16 secs	6 17 secs	8 16 secs	9 16 secs	6 17 secs
17/4	M42 Southbound Circulating Lane 4	1800	Queue Aver Delay	3 30 secs	3 30 secs	4 18 secs	3 30 secs	4 30 secs	4 17 secs
16/1	Exit to M42 Northbound Toucan Crossing	2200	Queue Aver Delay	N/A	N/A	1 2 secs	N/A	N/A	1 1 sec
23/1 + 25/1	A5 Westbound Lane 1	1930	Queue Aver Delay	3 8 secs	3 8 secs	4 8 secs	3 12 secs	4 9 secs	4 8 secs
23/2	A5 Westbound Lane 2	1851	Queue Aver Delay	2 6 secs	2 7 secs	3 7 secs	2 8 secs	2 7 secs	3 7 secs
23/3 + 24/2 + 25/2	A5 Westbound Lane 3	1851	Queue Aver Delay	24 54 secs	36 1m 21s	33 1m 18s	34 1m 10s	35 1m 20s	39 1m 35s
23/4 + 24/3 + 25/3	A5 Westbound Lane 4	1851	Queue Aver Delay	15 46 secs	28 1m 12s	30 1m 19s	18 52 secs	29 1m 10s	31 1m 28s
22/1	A5 Westbound Circulating Lane 1	1797	Queue Aver Delay	8 53 secs	8 53 secs	6 47 secs	8 55 secs	11 1m 13s	8 55 secs

22/2	A5 Westbound Circulating Lane 2	1797	Queue Aver Delay	6 53 secs	7 52 secs	7 58 secs	7 51 secs	7 54 secs	8 1m 4s
22/3	A5 Westbound Circulating Lane 3	1902	Queue Aver Delay	3 37 secs	4 37 secs	3 37 secs	4 37 secs	4 37 secs	4 36 secs
22/4	A5 Westbound Circulating Lane 4	1902	Queue Aver Delay	5 22 secs	5 22 secs	5 22 secs	5 22 secs	5 22 secs	4 23 secs
28/1 + 29/1	Trinity Road Lane 1	1669	Queue Aver Delay	7 1m 7s	12 1m 45s	10 1m 38s	8 1m 15s	12 1m 58s	12 1m 57s
28/2	Trinity Road Lane 2	1669	Queue Aver Delay	5 1m 4s	6 1m 17s	5 1m 19s	4 1m 1s	5 1m 11s	6 1m 14s
27/1	Trinity Road Circulating Lane 1	1846	Queue Aver Delay	3 6 secs	4 8 secs	2 6 secs	4 7 secs	4 8 secs	3 7 secs
27/2	Trinity Road Circulating Lane 2	1846	Queue Aver Delay	7 8 secs	7 10 secs	8 8 secs	9 9 secs	8 10 secs	8 8 secs
27/3	Trinity Road Circulating Lane 3	1878	Queue Aver Delay	13 13 secs	16 14 secs	16 14 secs	15 14 secs	16 14 secs	16 14 secs
27/4	Trinity Road Circulating Lane 4	1878	Queue Aver Delay	15 15 secs	16 15 secs	16 15 secs	15 15 secs	16 115 secs	16 15 secs
A5/ Site Access									
56/1	A5 Eastbound Left Turn Lane 1	1751	Queue Aver Delay	N/A	14 16 secs	14 16 secs	N/A	14 17 secs	14 17 secs
56/2 + 21/1	A5 Eastbound Lane 2	1814	Queue Aver Delay	N/A	14 13 secs	14 14 secs	N/A	12 13 secs	13 13 secs
53/3 + 21/2	A5 Eastbound Lane 3	2082	Queue Aver Delay	N/A	5 8 secs	5 8 secs	N/A	5 8 secs	5 8 secs
59/2 + 62/1 + 61/1 + 39/1	A5 Westbound Lane 1	2015	Queue Aver Delay	N/A	97 56 secs	20 44 secs	N/A	43 1m 36s	32 1m 15s
59/3 + 62/2 + 61/2 + 39/2	A5 Westbound Lane 2	2015	Queue Aver Delay	N/A	23 56 secs	20 44 secs	N/A	42 1m 37s	30 1m 14s
60/1	A5 Westbound Right Turn Lane 3	1667	Queue Aver Delay	N/A	1 1m 5s	1 1 min	N/A	1 53 secs	1 1 min
54/1	Site Access Left Turn Lane 1	1695	Queue Aver Delay	N/A	1 23 secs	1 23 secs	N/A	1 23 secs	1 23 secs
55/1	Site Access Right Turn Lane 2	1690	Queue Aver Delay	N/A	2 32 secs	1 34 secs	N/A	1 32 secs	1 37 secs
55/2	Site Access Right Turn Lane 3	1690	Queue Aver Delay	N/A	2 33 secs	2 35 secs	N/A	2 31 secs	2 37 secs
A5/ Birch Coppice									
31/1	A5 Eastbound Ahead Lane 1	1814	Queue Aver Delay	10 13 secs	5 14 secs	4 14 secs	13 12 secs	5 12 secs	4 13 secs
31/2	A5 Eastbound Ahead Lane 2	2082	Queue Aver Delay	11 11 secs	4 10 secs	3 9 secs	8 10 secs	3 9 secs	3 9 secs
32/1	A5 Eastbound Right Turn Lane 3	1960	Queue Aver Delay	4 1m 3s	5 59 secs	5 1m 1s	7 1m 25s	5 1m 5s	6 1m 18s
32/2	A5 Eastbound Right Turn Lane 4	1667	Queue Aver Delay	2 52 secs	2 43 secs	3 44 secs	3 51 secs	2 45 secs	2 44 secs
37/1	A5 Westbound Ahead Lane 1	1751	Queue Aver Delay	2 12 secs	2 13 secs	2 12 secs	2 11 secs	2 10 secs	2 11 secs
37/2 + 38/1	A5 Westbound Ahead Lane 2	2015	Queue Aver Delay	9 29 secs	9 32 secs	9 29 secs	10 39 secs	10 45 secs	10 43 secs
37/3 + 38/2	A5 Westbound Ahead Lane 3	2015	Queue Aver Delay	9 31 secs	9 32 secs	9 29 secs	11 40 secs	10 45 secs	10 44 secs
42/1	Birch Coppice Left Turn Lane 1	1695	Queue Aver Delay	8 27 secs	7 29 secs	8 30 secs	9 30 secs	8 33 secs	8 32 secs
42/2	Birch Coppice Left Turn Lane 2	1983	Queue Aver Delay	8 35 secs	7 34 secs	8 42 secs	9 33 secs	8 36 secs	8 37 secs
43/1 + 44/2	Birch Coppice Right Turn Lane 3	1690	Queue Aver Delay	19 1m 39s	16 1m 33s	16 1m 36s	15 1m 23s	15 1m 29s	16 1m 37s
A5/ Core 42									
46/1	A5 Eastbound Ahead Lane 1	1833	Queue Aver Delay	1 9 secs	1 9 secs	2 9 secs	3 9 secs	2 8 secs	1 8 secs
46/2	A5 Eastbound Ahead Lane 2	2082	Queue Aver Delay	1 5 secs	1 5 secs	1 5 secs	1 5 secs	1 4 secs	1 4 secs
47/1	A5 Eastbound Right Turn Lane 3	1667	Queue Aver Delay	1 21 secs	1 19 secs	1 22 secs	1 21 secs	1 22 secs	1 22 secs
49/1	A5 Westbound Ahead & Left Turn Lane 1	1957	Queue Aver Delay	21 52 secs	18 49 secs	12 26 secs	21 46 secs	20 52 secs	22 57 secs
49/2	A5 Westbound Ahead Lane 2	1909	Queue Aver Delay	21 43 secs	17 45 secs	12 26 secs	24 53 secs	22 1m 3s	24 58 secs
51/1	Core 42 Left Turn Lane 1	1695	Queue Aver Delay	3 17 secs	3 17 secs	4 20 secs	3 20 secs	4 25 secs	3 23 secs
52/1	Core 42 Right Turn Lane 2	1690	Queue Aver Delay	3 1m 22s	3 1m 22s	3 1m 19s	3 1m 20s	3 1m 22s	3 1m 22s
			Network PI	5805.88	7376.85	6651.73	6456.33	8194.02	7585.32

= new traffic streams as a result of the proposed development site access junction

= new traffic streams as a result of proposed off-site mitigation improvements

Table 5.1: M42/ Junction 10 + A5/ Birch Coppice + A5/ Core 42, 2031 Local Plan

				2031			
M42 Junction 10							
Traffic Stream(s)	Lane	Saturation Flow pcu/hr	Model Output	AM Peak No Dev	AM Peak With Dev	PM Peak No Dev	PM Peak With Dev
1/1	M42 Northbound Offslip Lane 1	1740	Queue Aver Delay	3 24 secs	3 24 secs	4 23 secs	4 23 secs
1/2	M42 Northbound Offslip Lane 2	1740	Queue Aver Delay	2 23 secs	2 23 secs	3 22 secs	3 22 secs
1/3	M42 Northbound Offslip Lane 3	1740	Queue Aver Delay	3 23 secs	1 21 secs	3 22 secs	2 21 secs
3/1	M42 Northbound Offslip Lane 4	1849	Queue Aver Delay	6 28 secs	13 52 secs	8 27 secs	10 33 secs
3/2	M42 Northbound Offslip Lane 5	1849	Queue Aver Delay	10 36 secs	12 40 secs	10 32 secs	10 32 sec
7/1	M42 Northbound Circulating Lane 1	2039	Queue Aver Delay	3 5 secs	3 6 secs	7 8 secs	8 7 secs
7/2	M42 Northbound Circulating Lane 2	1840	Queue Aver Delay	6 4 secs	6 4 secs	22 20 secs	15 18 secs
7/3	M42 Northbound Circulating Lane 3	1840	Queue Aver Delay	6 7 secs	9 7 secs	15 16 secs	21 18 secs
7/4	M42 Northbound Circulating Lane 4	1840	Queue Aver Delay	3 4 secs	3 7 secs	4 17 secs	5 21 secs
8/1 + 9/1 + 11/1	A5 Eastbound Lane 1	1828	Queue Aver Delay	3 10 secs	3 11 secs	3 15 secs	3 16 secs
8/2 + 9/2 + 11/2 + 63/1	A5 Eastbound Lane 2	1900	Queue Aver Delay	14 32 secs	33 1m 37s	34 2m 34s	46 3m 11s
8/3 + 9/2 + 11/2 (9/3 + 11/3) + 63/2	A5 Eastbound Lane 3	1900	Queue Aver Delay	11 27 secs	24 1m 4s	41 2m 27s	66 3m 59s
8/4	A5 Eastbound Lane 4	1900	Queue Aver Delay	5 16 secs	5 21 secs	6 29 secs	6 30 secs
12/1	A5 Eastbound Circulating Lane 1	1846	Queue Aver Delay	10 35 secs	10 31 secs	4 20 secs	5 22 secs
12/2	A5 Eastbound Circulating Lane 2	1878	Queue Aver Delay	2 9 secs	2 12 secs	1 3 secs	2 4 secs
12/3	A5 Eastbound Circulating Lane 3	1878	Queue Aver Delay	6 32 secs	6 31 secs	8 36 secs	9 37 secs
12/4	A5 Eastbound Circulating Lane 4	1878	Queue Aver Delay	12 43 secs	12 47 secs	11 40 secs	12 46 secs
14/1	Green Lane Lane 1	1602	Queue Aver Delay	12 2m 35s	15 3m 3s	7 47 secs	6 53 secs
14/2	Green Lane Lane 2	1602	Queue Aver Delay	18 3m 54s	18 4m 5s	19 2m 47s	26 4m 6s
15/1	Green Lane Circulating Lane 1	1950	Queue Aver Delay	3 6 secs	3 6 secs	4 10 secs	3 9 secs
15/2	Green Lane Circulating Lane 2	1745	Queue Aver Delay	7 8 secs	11 9 secs	16 15 secs	19 16 secs
15/3	Green Lane Circulating Lane 3	1745	Queue Aver Delay	16 10 secs	18 11 secs	18 16 secs	19 17 secs
15/4	Green Lane Circulating Lane 4	1745	Queue Aver Delay	1 3 secs	2 4 secs	2 5 secs	2 5 secs
13/1	Exit to Green Lane Toucan Crossing	2272	Queue Aver Delay	N/A	1 2 secs	N/A	1 2 secs
18/1	M42 Southbound Offslip Lane 1	1804	Queue Aver Delay	2 43 secs	4 41 secs	1 47 secs	3 28 secs
18/2	M42 Southbound Offslip Lane 2	1813	Queue Aver Delay	2 32 secs	6 57 secs	3 34 secs	5 50 secs
18/3	M42 Southbound Offslip Lane 3	1813	Queue Aver Delay	3 35 secs	4 35 secs	2 25 secs	2 26 secs
17/1	M42 Southbound Circulating Lane 1	1956	Queue Aver Delay	9 3 secs	10 3 secs	11 7 secs	9 6 secs
17/2	M42 Southbound Circulating Lane 2	1956	Queue Aver Delay	12 3 secs	12 3 secs	10 6 secs	11 6 secs
17/3	M42 Southbound Circulating Lane 3	1800	Queue Aver Delay	3 5 secs	4 7 secs	7 14 secs	8 13 secs
17/4	M42 Southbound Circulating Lane 4	1800	Queue Aver Delay	2 7 secs	2 7 secs	3 10 secs	2 9 secs
16/1	Exit to M42 Northbound Toucan Crossing	2200	Queue Aver Delay	N/A	1 2 secs	N/A	1 2 secs
23/1	A5 Westbound Lane 1	1930	Queue Aver Delay	6 13 secs	8 14 secs	2 4 secs	5 9 secs
23/2 + 24/1 + 25/1	A5 Westbound Lane 2	1851	Queue Aver Delay	13 36 secs	12 28 secs	3 9 secs	8 15 secs
23/3 + 24/2 + 25/2	A5 Westbound Lane 3	1851	Queue Aver Delay	9 10 secs	9 12 secs	4 6 secs	4 8 secs

23/4 + 24/3 + 25/3	A5 Westbound Lane 4	1851	Queue Aver Delay	7 9 secs	9 12 secs	3 4 secs	12 20 secs
22/1	A5 Westbound Circulating Lane 1	1797	Queue Aver Delay	14 59 secs	16 1m 5s	13 1m 30s	15 1m 40s
22/2	A5 Westbound Circulating Lane 2	1797	Queue Aver Delay	6 29 secs	5 28 secs	13 1m 22s	6 50 secs
22/3	A5 Westbound Circulating Lane 3	1902	Queue Aver Delay	1 2 secs	1 2 secs	2 15 secs	3 12 secs
22/4	A5 Westbound Circulating Lane 4	1902	Queue Aver Delay	1 1 sec	1 1 sec	3 14 secs	3 11 secs
28/1 + 29/1	Trinity Road Lane 1	1669	Queue Aver Delay	1 30 secs	2 31 secs	3 29 secs	3 28 secs
28/2	Trinity Road Lane 2	1669	Queue Aver Delay	1 30 secs	1 30 secs	1 28 secs	2 28 secs
28/3	Trinity Road Lane 3	1669	Queue Aver Delay	4 39 secs	3 39 secs	5 34 secs	4 33 secs
27/1	Trinity Road Circulating Lane 1	1846	Queue Aver Delay	6 8 secs	9 7 secs	4 6 secs	4 7 secs
27/2	Trinity Road Circulating Lane 2	1846	Queue Aver Delay	15 10 secs	15 9 secs	14 13 secs	13 12 secs
27/3	Trinity Road Circulating Lane 3	1878	Queue Aver Delay	5 2 secs	6 3 secs	7 9 secs	5 7 secs
27/4	Trinity Road Circulating Lane 4	1878	Queue Aver Delay	6 5 secs	9 4 secs	6 7 secs	9 10 secs
A5/ Proposed Site Access							
56/1	A5 Eastbound Lane 1	1751	Queue Aver Delay	N/A	20 26 secs	N/A	15 24 secs
56/2 + 21/1	A5 Eastbound Lane 2	1814	Queue Aver Delay	N/A	23 24 secs	N/A	13 15 secs
53/3 + 21/2	A5 Eastbound Lane 3	2082	Queue Aver Delay	N/A	6 9 secs	N/A	5 9 secs
59/2 + 62/1 + 61/1 + 39/1	A5 Westbound Lane 1	2015	Queue Aver Delay	N/A	10 15 secs	N/A	13 18 secs
59/3 + 62/2 + 61/2 + 39/2	A5 Westbound Lane 2	2015	Queue Aver Delay	N/A	11 16 secs	N/A	11 19 secs
60/1	A5 Westbound Right Turn Lane 3	1667	Queue Aver Delay	N/A	1 1m 2s	N/A	1 1 min
54/1	Site Access Left Turn Lane 1	1695	Queue Aver Delay	N/A	1 23 secs	N/A	1 23 secs
55/1	Site Access Right Turn Lane 2	1690	Queue Aver Delay	N/A	1 27 secs	N/A	2 28 secs
55/2	Site Access Right Turn Lane 3	1690	Queue Aver Delay	N/A	1 29 secs	N/A	11 28 secs
A5/ Birch Coppice							
31/1	A5 Eastbound Ahead Lane 1	1814	Queue Aver Delay	7 7 secs	4 10 secs	19 20 secs	6 13 secs
31/2	A5 Eastbound Ahead Lane 2	2082	Queue Aver Delay	9 5 secs	4 7 secs	22 20 secs	10 12 secs
32/1	A5 Eastbound Right Turn Lane 3	1960	Queue Aver Delay	6 1m 8s	7 56 secs	3 53 secs	3 40 secs
32/2	A5 Eastbound Right Turn Lane 4	1667	Queue Aver Delay	5 1m 3s	5 55 secs	2 50 secs	2 37 secs
37/1	A5 Westbound Ahead Lane 1	1751	Queue Aver Delay	2 9 secs	2 9 secs	1 5 secs	2 6 secs
37/2 + 38/1 + 53/1	A5 Westbound Ahead Lane 2	2015	Queue Aver Delay	10 24 secs	9 27 secs	17 1m 6s	18 1m 10s
37/3 + 38/2 + 53/2	A5 Westbound Ahead Lane 3	2015	Queue Aver Delay	10 28 secs	10 28 secs	18 1m 11s	18 1m 16s
42/1	Birch Coppice Left Turn Lane 1	1695	Queue Aver Delay	3 31 secs	3 31 secs	4 27 secs	4 27 secs
42/2	Birch Coppice Left Turn Lane 2	1983	Queue Aver Delay	2 29 secs	2 39 secs	4 30 secs	4 33 secs
43/1 + 44/2	Birch Coppice Right Turn Lane 3	1690	Queue Aver Delay	3 44 secs	3 46 secs	11 1m 34s	14 1m 28s
A5/ Core 42							
46/1 + 45/1	A5 Eastbound Ahead Lane 1	1833	Queue Aver Delay	2 8 secs	1 7 secs	5 6 secs	5 5 secs
46/2 + 45/2	A5 Eastbound Ahead Lane 2	2082	Queue Aver Delay	2 3 secs	2 3 secs	7 7 secs	5 6 secs
47/1	A5 Eastbound Right Turn Lane 3	1667	Queue Aver Delay	14 1m 52s	9 1m 31s	1 23 secs	1 22 secs
49/1	A5 Westbound Ahead & Left Turn Lane 1	1957	Queue Aver Delay	73 2m 38s	87 3m 7s	37 1m 31s	44 1m 51s
49/2	A5 Westbound Ahead Lane 2	1909	Queue Aver Delay	85 3m 8s	92 3m 31s	39 1m 47s	46 2m 5s
51/1	Core 42 Left Turn Lane 1	1695	Queue Aver Delay	2 26 secs	2 26 secs	3 28 secs	3 26 secs
52/1	Core 42 Right Turn Lane 2	1690	Queue Aver Delay	3 3m 20s	4 3m 33s	3 1m 40s	4 1m 45s
			Network PI	6888.43	8738.53	7152.69	8965.65

= new traffic streams as a result of the proposed development site access junction

= new traffic streams as a result of proposed off-site mitigation works

= new traffic streams as a result of potential Local Plan Improvements (Phil Jones Associates Drawing 02853-01 Rev A)

APPENDIX D SOUTH PENNINE WAY MODELLING REPORT

1 INTRODUCTION

1.1 Tetra Tech (TT) have been appointed by Hodgetts Estates to provide technical support for their outline planning application for a proposed development of up to 100,000sqm of employment floorspace and 150 space overnight lorry park (including an associated 400sqm amenity block) on land north-east of M42 Junction 10. The application is also supported by a Transport Assessment (TA) prepared by Bancroft Consulting, Version C dated November 2021, which is currently being updated by TT.

1.2 This Pennine Way Roundabout Modelling Note follows discussions with highway officers at Staffordshire County Council (SCC). A meeting was held between TT and SCC on 9th September 2022 and the following actions were agreed;

1. Arrange traffic survey for the two Pennine Way roundabout junctions, as shown below at image 1.1.

Image 1.1 – Pennine Way Roundabout Junctions



2. Prepare an assignment for the Development Generated trips into Tamworth, west of the M42 Junction 10 Interchange.
3. Assess the impact at the Pennine Way North and South roundabouts. SCC requested that the model files are submitted that these are in Junctions 9 format.

1.3 This Note follows the order listed above and additional information has been provided where necessary to clearly set out the modelling approach undertaken.

2 TRAFFIC SURVEYS

2.1 The two Pennine Way roundabouts were surveyed on Wednesday 5th October 2022. The traffic flows were converted into Passenger Car Units (PCU) and the peak hour traffic flows derived. The AM peak hour was 07:45 to 08:45 and the PM peak hour was 16:00 to 17:00. The data can be provided as an excel file on request. TT Figure A shows the 2022 AM Peak surveyed flows and TT Figure B shows the PM peak equivalent, both attached in Appendix A.

2.2 At the same time of the traffic counts, queue observations per lane were recorded at minute intervals. The reported queues are attached at Appendix B. Junctions 9 reports the average queue in the busiest 15-minute period, therefore the longest queue observed during a 15-minute period within the peak hours has been determined. The longest average 15-minute queue has been highlighted yellow in Appendix B and the combined queues on each approach have been added together and are highlighted in cyan. Table 2.1 below summarises the average queue during the busiest 15-minute period in each peak hour.

Table 2.1: Pennine Way Roundabout – Observed Queues (Busiest 15 minute period)

	Northern Roundabout	
	AM Peak	PM Peak
B05080 Pennine Way Northbound	0	0
B05080 Pennine Way Southbound	0	0
A5 Bypass On/ Off slip	0	0
	Southern Roundabout	
	AM Peak	PM Peak
B5404 Quarry Hill	0	1
B05080 Pennine Way Southbound	0	0
A5 Bypass On/ Off slip	1	0
Centurion Way	0	1

2.3 The queueing results shows that the two roundabouts perform well with minimal queuing.

3 Development Generated Traffic Flows & Assignment

3.1 The assignment of development generated trips has been set out in an email to SCC on 14th October 2022 and agreed by SCC on 16th November (both attached at Appendix C), and for ease of reference is summarised below.

3.2 The Census 2011 Journey to Work Data has been analysed using the North Warwickshire MSOA 002 as the place of work (the area the proposed development sits within). As this element of work is only focused on the SCC network, only destinations that would be routed by the A5 Wilnecote Bypass have been retained, all other destinations have been removed from the sample set. Table 1 attached at Appendix C shows the Census 2011 journey routing assumptions, allocated to 6 routes, A to F through the Pennine Way roundabouts, the A5/ B5440 Marlborough Way interchange and the A5/ Bitterscote Drive interchange. TT Figure C shows the routing assumptions (A to F) diagrammatically and TT Figure D shows the resultant traffic assignment percentages, both attached in Appendix A.

3.3 Following previous discussions with SCC, it was demonstrated and agreed with SCC to use the Atherstone A5 PARAMICS modelled flows immediately west of the M42 Junction 10 interchange (Note, the A5 PARAMICS model was developed by Vectos on behalf of

Warwickshire CC for the North Warwickshire BC Local Plan and was agreed by National Highways and Staffordshire CC). SCC confirmed that the volume of development generated traffic immediately west of the Junction 10 interchange is 102pcu eastbound in the AM peak and 74pcu westbound. In the PM peak the eastbound flow is 72pcu and the westbound flow is 68pcu. These agreed flows have then been assigned through the SCC network based on the assignment as shown at TT Figure D. TT Figure E attached in Appendix A shows the development generated traffic flows in the AM Peak hour and TT Figure F shows the PM Peak equivalent.

2031 Reference Case Flows

- 3.4 The 2031 Reference Case flows have been supplied by Vectos from the WCC Atherstone A5 PARAMICS model. Vectos have confirmed that only the northern roundabout was calibrated and validated in their model, therefore only the northern roundabout flows have been used. TT Figure G attached in Appendix A shows the 2031 AM Peak Reference Case No Development flows and Figure H shows the PM peak equivalent.
- 3.5 To determine the southern roundabout turning flows (to/ from the northern roundabout) the northbound/ southbound flows on the overbridge have been applied to the surveyed turning proportions at the southern roundabout, refer to TT Figure G for the 2031 AM Peak, yellow and cyan cells.
- 3.6 No traffic growth has been applied to traffic to/ from Centurion Way as this development is fully built out and occupied.
- 3.7 One option for calculating the final east to west, west to east flows (green cells) at the southern roundabout flows is to apply a TEMPRO growth factor to the surveyed data. The TEMPRO growth factor for 2022 to 2031 using the Tamworth MSOA 008 area is 5.13% in the AM peak.

3.8 The alternative option is to determine the growth from using the surveyed flows at the northern roundabout and 2031 No Development flows from the PARAMICS model, which also takes into account traffic associated with committed developments in the Reference Case. The growth factor using this method is 16%, calculations shown at TT Figure G. Therefore, to be robust the 16% growth factor has been applied to the traffic flows.

3.9 To calculate the 2031 Reference Case With Development flows the AM Peak development generated flows have been added to the 2031 Reference No Development flows. TT Figure I shows the 2031 Reference Case With Development flows and Figure J shows the PM peak equivalent, both attached at Appendix A.

2031 Local Plan Flows

3.10 The 2031 Local Plan Flows have been derived in the same method as the 2031 Reference Case flows. TT Figure K shows the 2031 Local Plan AM Peak No Development flows and Figure L shows the PM peak equivalent, both attached in Appendix A. TT Figure M shows the 2031 Local Plan AM Peak With Development flows and Figure N shows the PM peak equivalent.

4 IMPACT ASSESSMENT

Model Validation

4.1 The two Pennine Way roundabouts have been modelled in TRL's Junctions 9 software program. The junction parameters were taken from OS Mapping and video footage from the survey data was used to establish which lanes drivers used for their choice of exit. The lane simulation mode was then set up in the model to recreate the observed driver behaviour and to accurately model the effects of unequal lane usage and also model any blocking back which would affect the performance of either junction. One noticeable observation was that drivers from the A5 eastbound off-slip (approach to the northern

roundabout) predominantly use the nearside lane to travel ahead to Pennine Way. The offside lane is therefore used very infrequently for drivers heading north to Pennine Way, as such the lane is effectively redundant. In the model the offside lane has been allocated to enable 10% of drivers “consider” using the lane for journeys north to Pennine Way. This means that 10% of traffic wanting to travel to Pennine Way will only actually use that lane if the queue is shorter than the nearside lane.

4.2 Table 4.1 below shows the 2022 modelled results and the observed queues are reported alongside for validation purposes. Junction output files are attached at Appendix D. A positive intercept pcu/hr correction has been applied to the Pennine Way northbound approach to the northern roundabout to calibrate the modelled queues to those observed. No corrections were applied to the other approaches.

Table 4.1: Pennine Way Roundabout – 2022 Modelled v Observed Queues

		Northern Roundabout			
		AM Peak		PM Peak	
		Modelled Results	Observed Queue	Modelled Results	Observed Queue
B05080 Pennine Way Northbound	Queue Delay	1 4 secs	0	2 5 secs	0
B05080 Pennine Way Southbound	Queue Delay	3 9 secs	0	1 6 secs	0
A5 Bypass On/ Off slip	Queue Delay	3 9 secs	0	1 5 secs	0
		Southern Roundabout			
		AM Peak		PM Peak	
		Modelled Results	Observed Queue	Modelled Results	Observed Queue
B5404 Quarry Hill	Queue Delay	1 8 secs	0	2 9 secs	1
B05080 Pennine Way Southbound	Queue Delay	1 6 secs	0	1 5 secs	0
A5 Bypass On/ Off slip	Queue Delay	2 8 secs	1	2 9 secs	0
Centurion Way	Queue Delay	0 6 secs	0	1 7 secs	1

4.3 The results show that in both the AM and PM peaks the junctions work well with minimal queues and delays in both peak hour periods. The modelled queues are generally 1 to 2 vehicles longer than those observed, therefore the model is considered to be validated and provides a good base for future projections.

2031 Reference Case

4.4 The validated model has been used to assess the performance of the two roundabouts in the 2031 Reference Case year, both with and without the proposed development traffic flows as discussed in Chapter 3. Table 4.2 below summarises the predicted results. Junction output files are attached at Appendix D.

Table 4.2: Pennine Way Roundabout – 2031 Reference Case

		Northern Roundabout			
		AM Peak		PM Peak	
		No Dev	With Dev	No Dev	With Dev
B05080 Pennine Way Northbound	Queue Delay	1 4 secs	2 4 secs	6 13 secs	6 14 secs
B05080 Pennine Way Southbound	Queue Delay	7 23 secs	10 32 secs	2 9 secs	2 9 secs
A5 Bypass On/ Off slip	Queue Delay	0 4 secs	0 4 secs	0 4 secs	1 4 secs
		Southern Roundabout			
		AM Peak		PM Peak	
		No Dev	With Dev	No Dev	With Dev
B5404 Quarry Hill	Queue Delay	4 17 secs	5 20 secs	12 52 secs	14 1m 3s
B05080 Pennine Way Southbound	Queue Delay	1 5 secs	1 5 secs	1 5 secs	1 5 secs
A5 Bypass On/ Off slip	Queue Delay	2 9 secs	2 9 secs	8 24 secs	9 28 secs
Centurion Way	Queue Delay	0 6 secs	0 6 secs	1 8 secs	1 8 secs

4.5 In the No Development AM peak scenario the junction is predicted to operate with low levels of queues and delays; a maximum queue of 7pcu and average delay of 23 secs on the Pennine Way southbound approach to the northern roundabout is predicted. With the development generated traffic, the queue is predicted to increase by 3 pcu to 10pcu and

delay increase by 9 secs to 32 seconds. The impact of the development traffic on the Pennine Way southbound approach is small and is negligible on all other approaches.

- 4.6 In the No Development PM peak scenario, the two roundabouts are predicted to operate low levels of queues and delays. The longest queues and delays occur on the Quarry Hill approach to the southern roundabout and a maximum queue of 12pcu and average delay of 52 secs on the Quarry Hill approach to the southern roundabout. With the addition of development generated traffic, the Quarry Hill queue is predicted to increase by 2 vehicles to 14pcu and delay increase by 11 secs to 63 seconds. The impact of the development traffic on the Quarry Hill approach is low and is negligible on all other approaches.
- 4.7 The residual cumulative impact of the proposed development in the AM and PM peaks on the two roundabouts in the 2031 Reference Case are not considered severe with reference to NPPF para 111 and mitigation is therefore not required.

2031 Local Plan

- 4.8 The validated model has been used to assess the performance of the two roundabouts in the 2031 Local Plan scenario, both with and without the proposed development traffic flows as discussed in Chapter 3. Table 4.3 below summarises the predicted results. Junction output files are attached at Appendix D.

Table 4.3: Pennine Way Roundabout – 2031 Local Plan

		Northern Roundabout			
		AM Peak		PM Peak	
		No Dev	With Dev	No Dev	With Dev
B05080 Pennine Way Northbound	Queue Delay	1 4 secs	2 4 secs	6 13 secs	6 11 secs
B05080 Pennine Way Southbound	Queue Delay	10 29 secs	14 42 secs	3 10 secs	3 11 secs
A5 Bypass On/ Off slip	Queue Delay	0 4 secs	0 4 secs	0 4 secs	0 4 secs
		Southern Roundabout			
		AM Peak		PM Peak	
		No Dev	With Dev	No Dev	With Dev
B5404 Quarry Hill	Queue Delay	4 16 secs	5 19 secs	10 51 secs	14 1 min
B05080 Pennine Way Southbound	Queue Delay	1 5 secs	1 5 secs	1 5 secs	1 5 secs
A5 Bypass On/ Off slip	Queue Delay	2 9 secs	2 9 secs	8 25 secs	8 23 secs
Centurion Way	Queue Delay	0 6 secs	0 6 secs	1 8 secs	1 8 secs

- 4.9 In the No Development AM peak scenario the junction is predicted to operate with low levels of queues and delays; a maximum queue of 10pcu and average delay of 29 secs on the Pennine Way southbound approach to the northern roundabout is predicted. With the development generated traffic, the queue is predicted to increase by 4 pcu to 14pcu and delay increase by 13 secs to 42 seconds. The impact of the development traffic on the Pennine Way southbound approach is small and is negligible on all other approaches.
- 4.10 In the No Development PM peak scenario, the two roundabouts are predicted to operate low levels of queues and delays. The longest queues and delays occur on the Quarry Hill approach to the southern roundabout and a maximum queue of 10pcu and average delay of 51 secs on the Quarry Hill approach to the southern roundabout. With the addition of development generated traffic, the Quarry Hill queue is predicted to increase by 4 vehicles to 14pcu and delay increase by 9 secs to 1 minute. The impact of the development traffic the Quarry Hill approach is low and is negligible on all other approaches.

4.11 The residual cumulative impact of the proposed development in the AM and PM peaks on the two roundabouts in the 2031 Local Plan case are not considered severe with reference to NPPF para 111 and mitigation is therefore not required.

5 SUMMARY

5.1 An assessment of the impact of the proposed development generated traffic has been carried out at the two Pennine Way roundabout junctions as requested by SCC.

5.2 Traffic surveys were undertaken in October 2022 and queue observations demonstrated the junctions operate well with minimal queueing and delays. A validated Junctions 9 model was developed with marginally higher queues than those observed and is considered a sound base for future projections.

5.3 Future year (2031) traffic flows for the northern roundabout were provided by VECTOS from the WCC Atherstone A5 PARAMICS model (prepared for Warwickshire County Council for the North Warwickshire BC Local Plan, approved by National Highways and SCC) and growth was applied to the surveyed traffic flows at the southern roundabout

5.4 Development generated traffic has been assigned to the A5 and M42 Jn10 using, as agreed with NH and WCC, the Atherstone A5 PARAMICS model. As requested by SCC, the generated traffic west of M42 Jn10 has been separately assigned using Census 2011 data. This assignment has been agreed with SCC.

5.5 The assessment has shown that the impact of the development generated traffic on the operation of the 2031 Reference and 2031 Local Plan cases is small on the Pennine Way southbound approach to the north roundabout in the AM peak, is small on the Quarry Hill approach to the south roundabout in the PM and is negligible on all other approaches. With reference to NPPF para 111, the cumulative residual impact is not severe, and no mitigation is required.

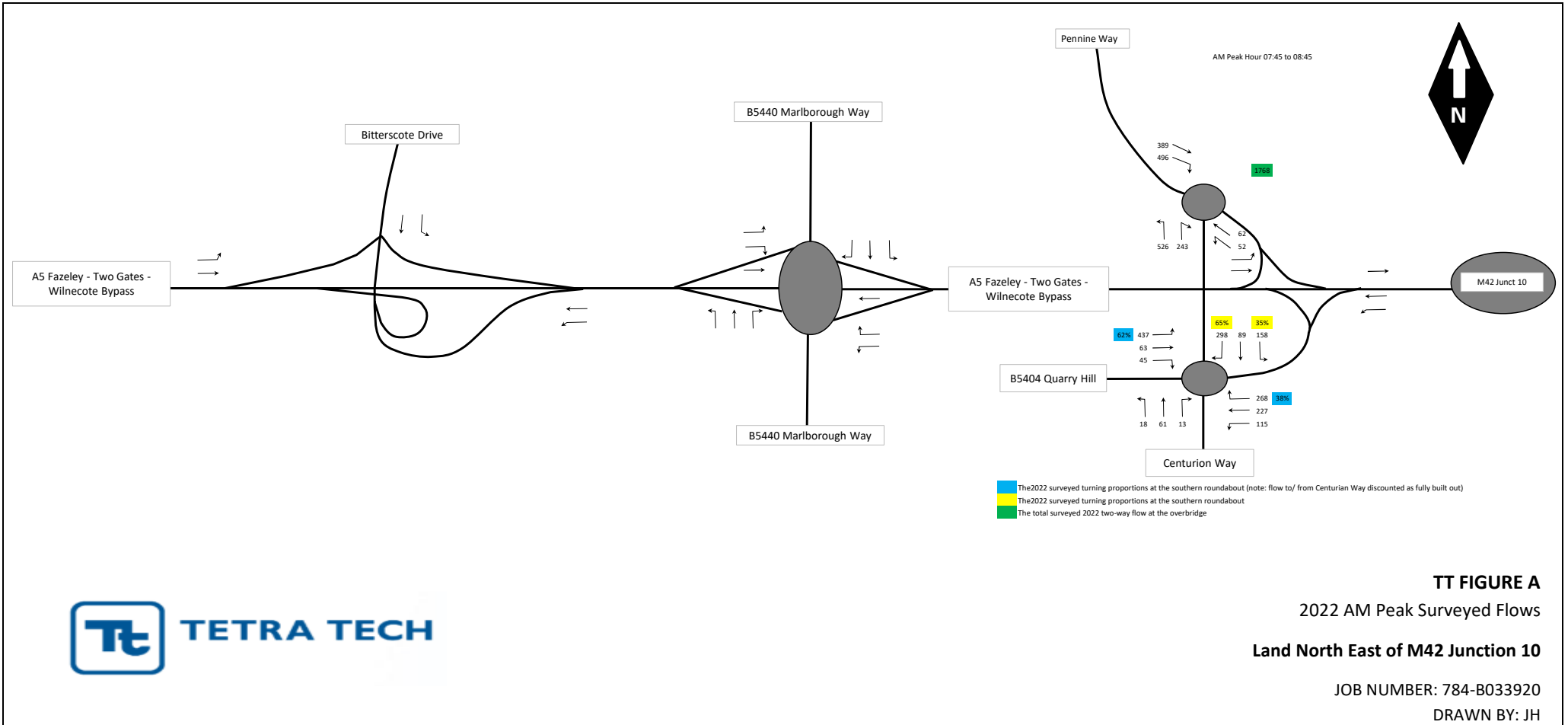
784-B033920
Land Northeast of M42 Junction 10
Pennine Way Roundabouts Modelling Note



Client: Hodgetts Estates

Date: 23 November 2022

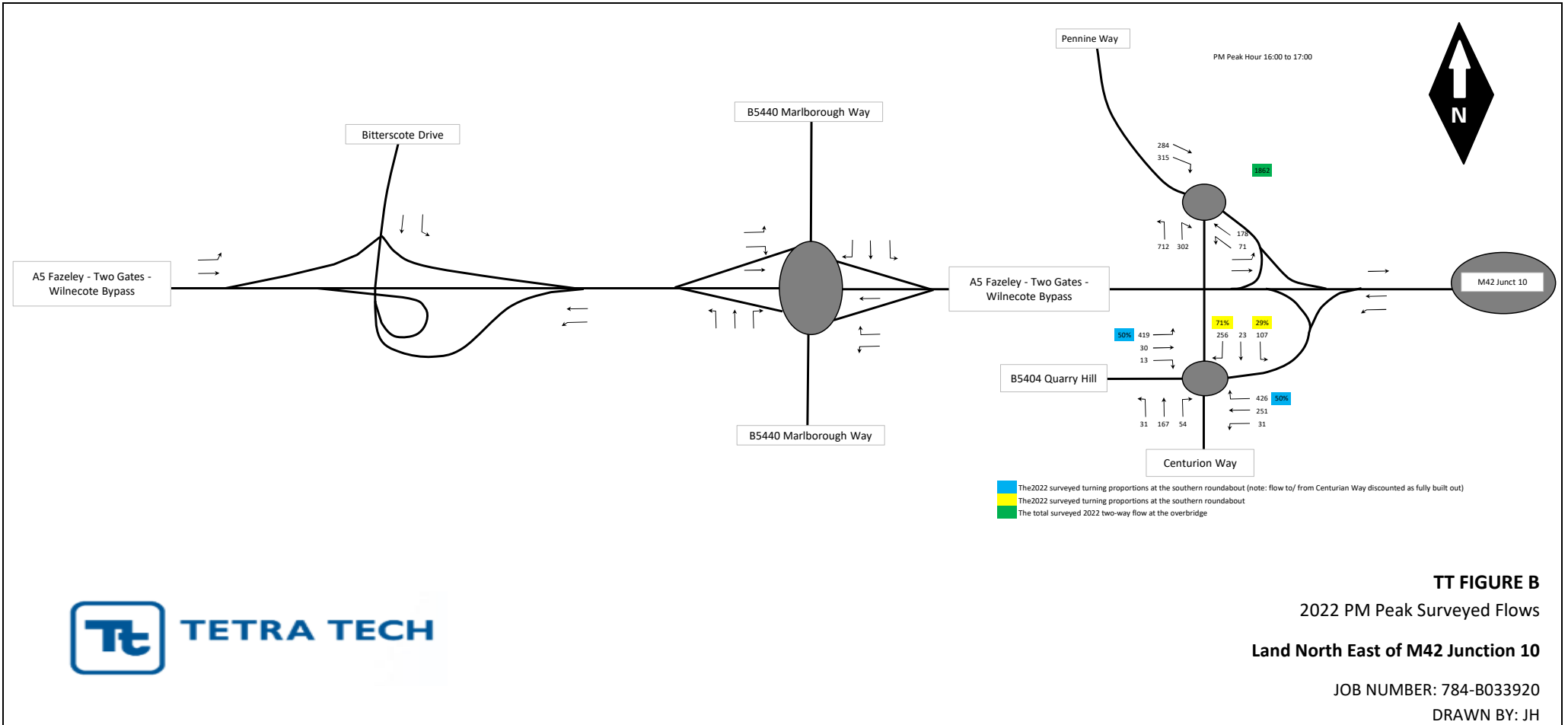
APPENDIX A - FIGURES



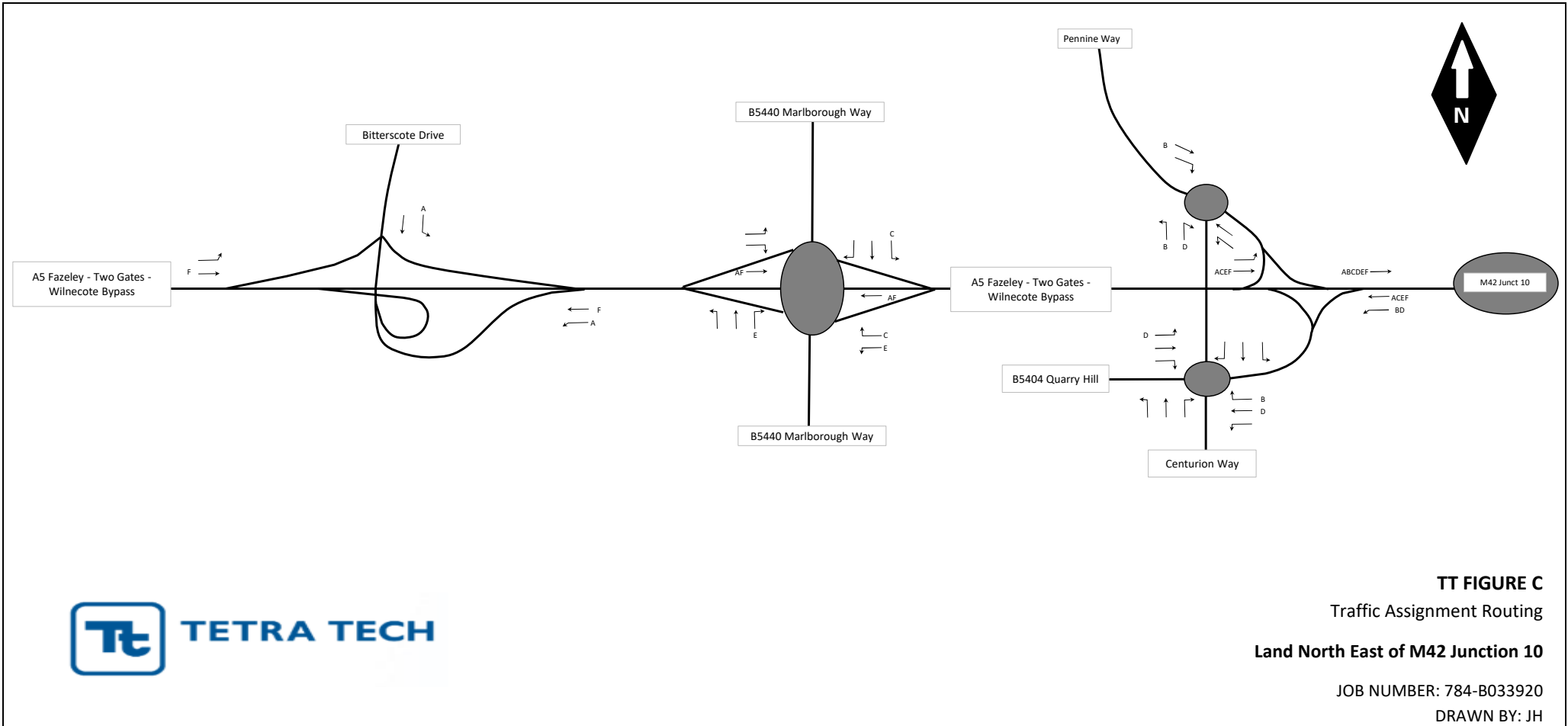
TT FIGURE A
2022 AM Peak Surveyed Flows
Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH

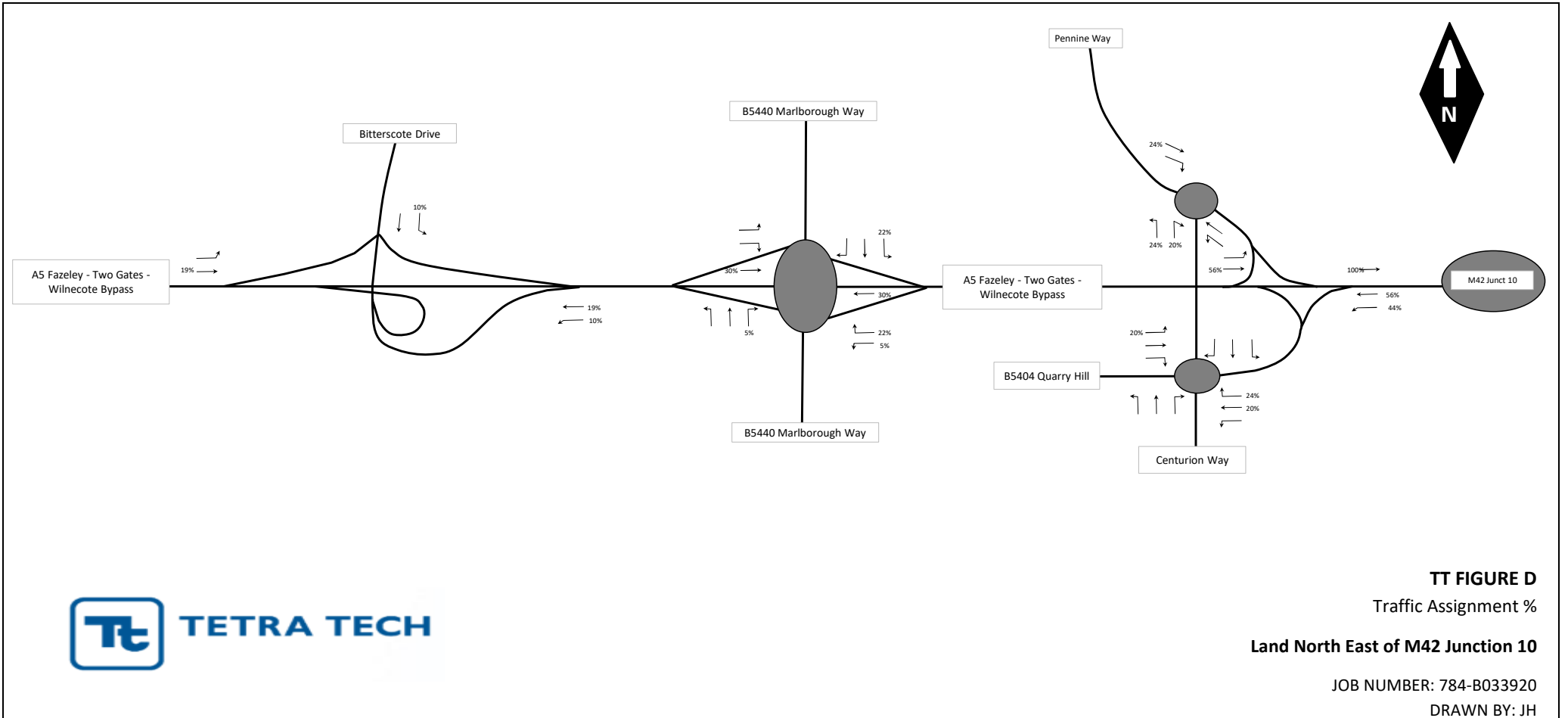


TT FIGURE B
 2022 PM Peak Surveyed Flows
Land North East of M42 Junction 10
 JOB NUMBER: 784-B033920
 DRAWN BY: JH



TT FIGURE C
 Traffic Assignment Routing
Land North East of M42 Junction 10

JOB NUMBER: 784-B033920
 DRAWN BY: JH



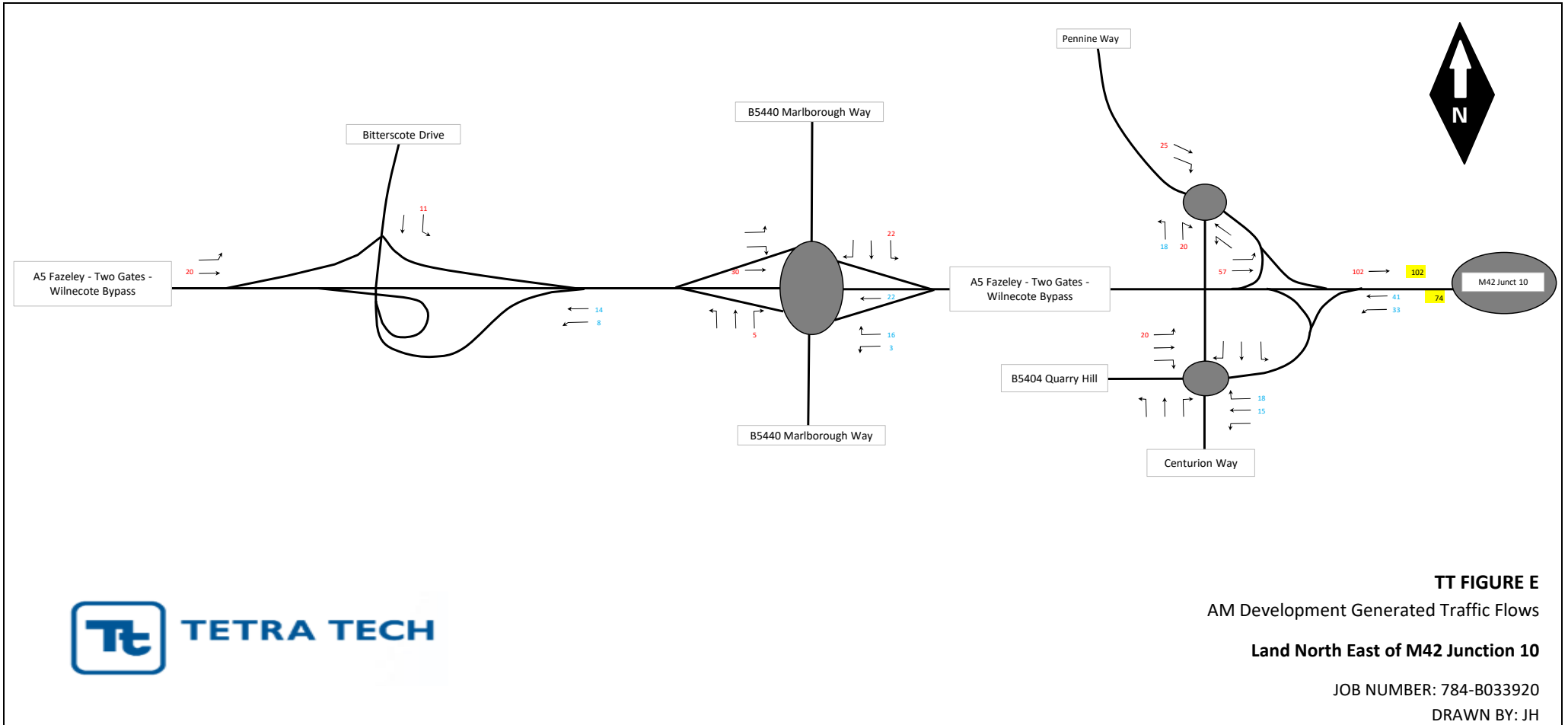
TT FIGURE D

Traffic Assignment %

Land North East of M42 Junction 10

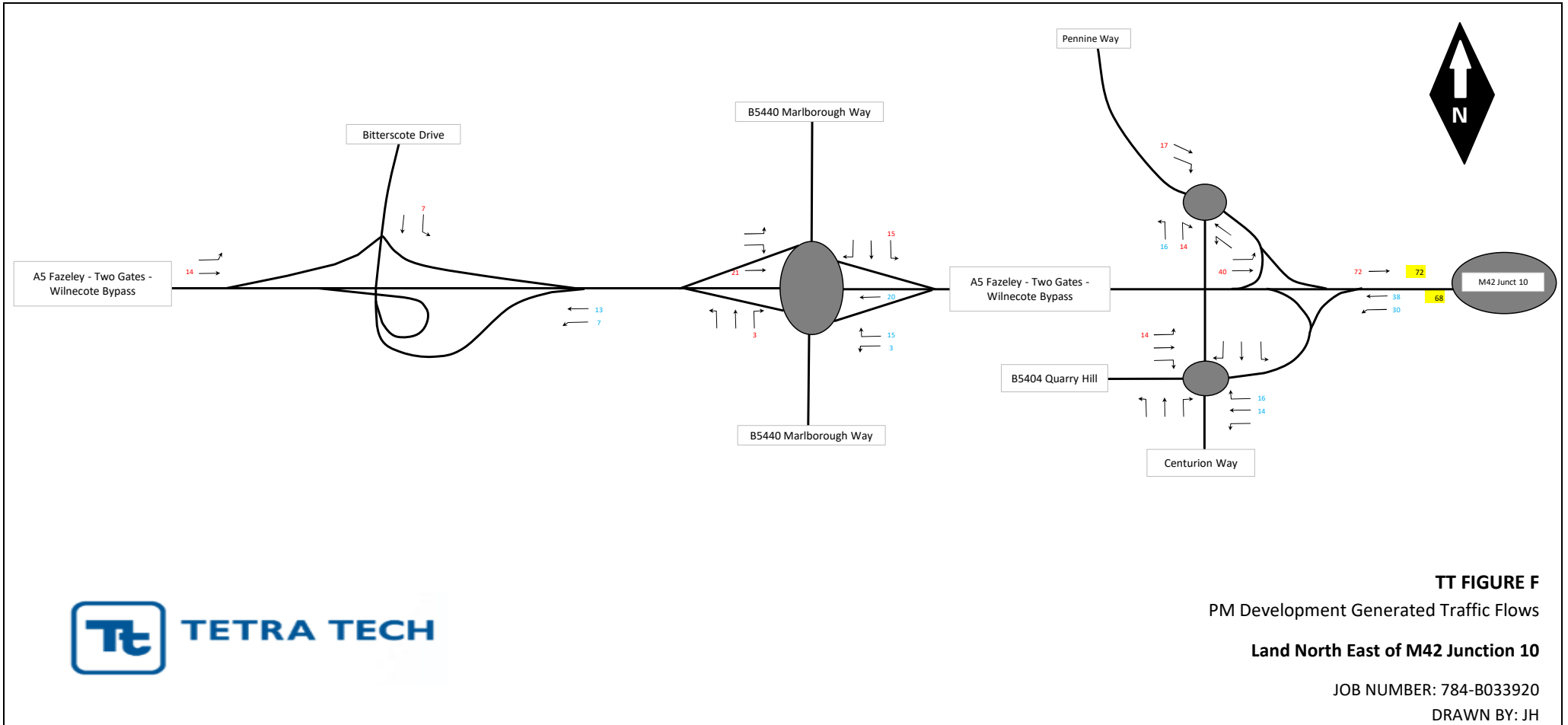
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DRAWN BY: JH



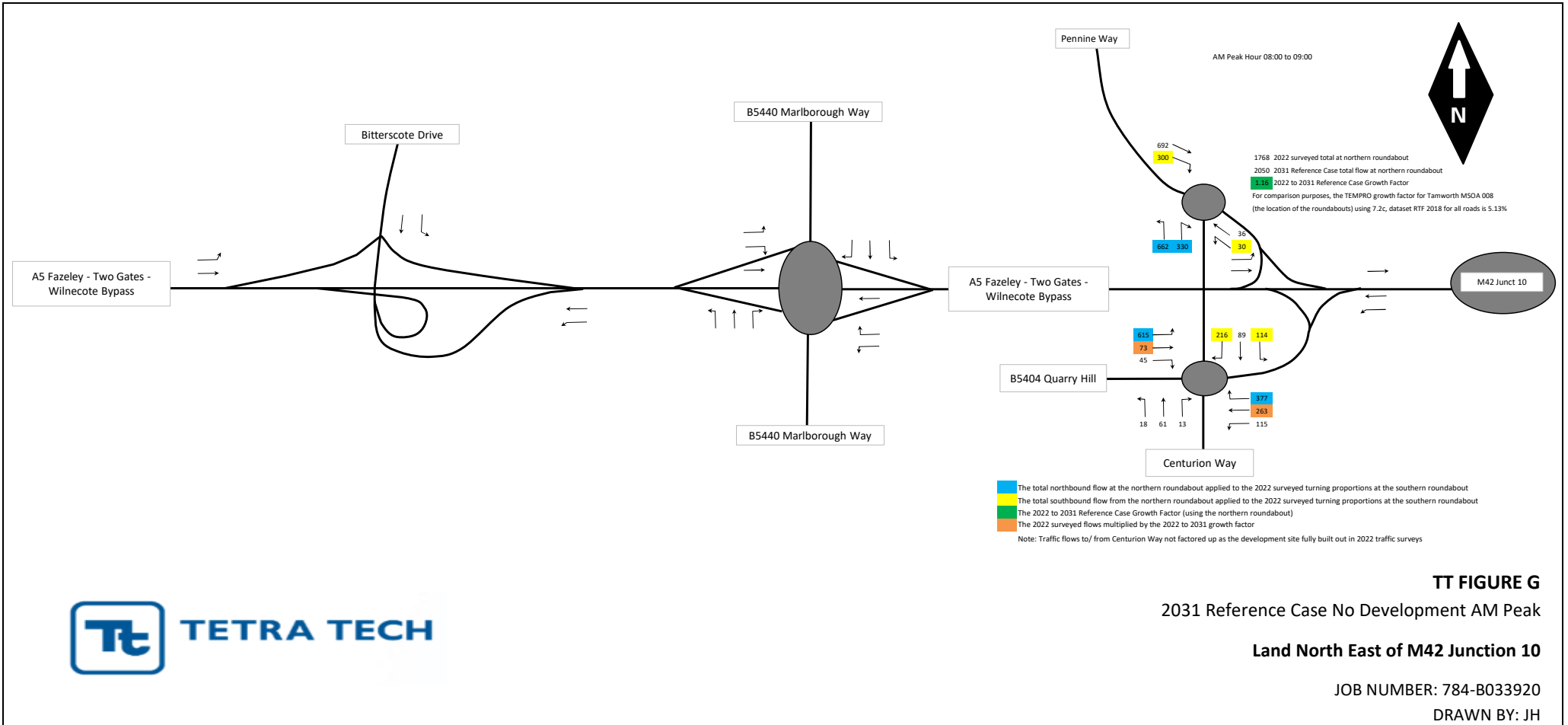
TT FIGURE E
 AM Development Generated Traffic Flows
 Land North East of M42 Junction 10

JOB NUMBER: 784-B033920
 DRAWN BY: JH



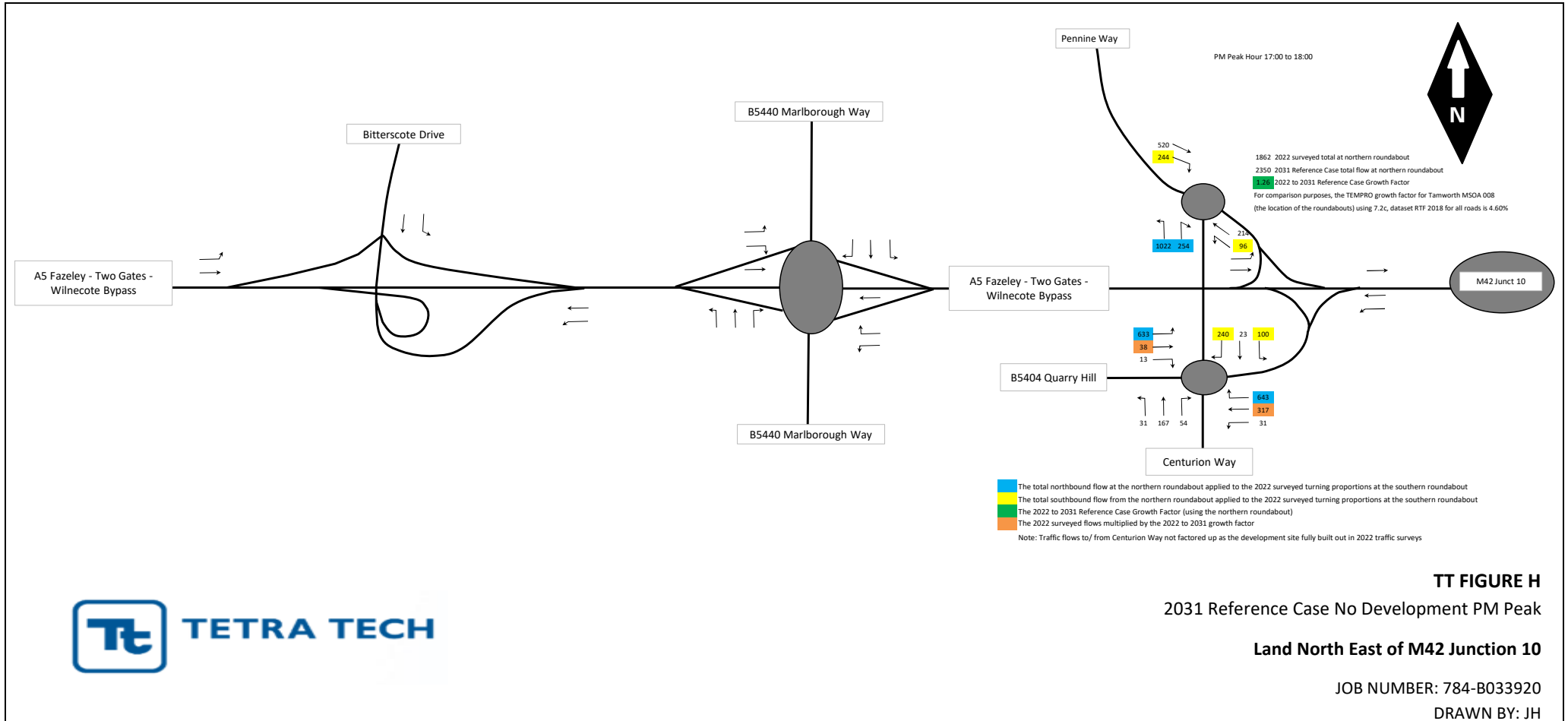
TT FIGURE F
 PM Development Generated Traffic Flows
 Land North East of M42 Junction 10

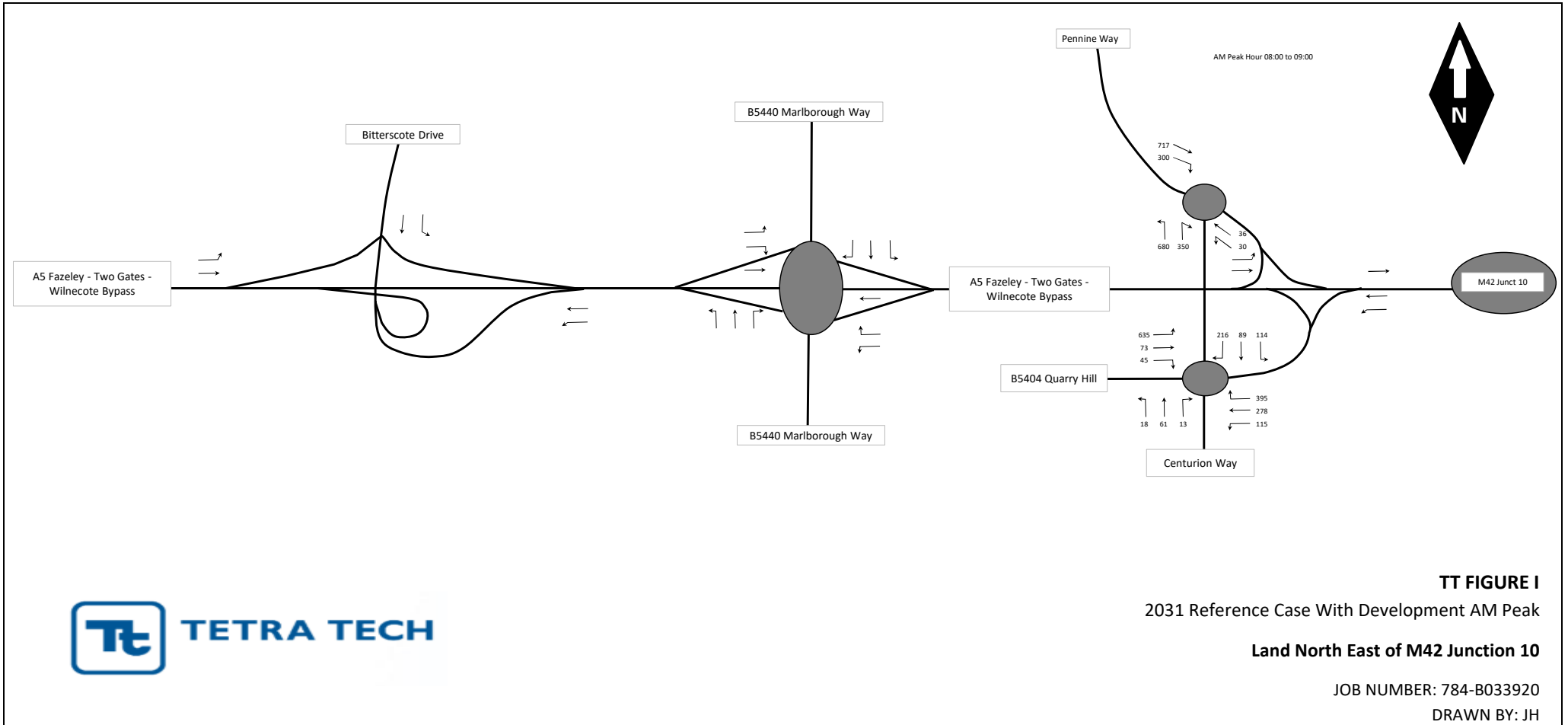
JOB NUMBER: 784-B033920
 DRAWN BY: JH



TT FIGURE G
 2031 Reference Case No Development AM Peak
 Land North East of M42 Junction 10

JOB NUMBER: 784-B033920
 DRAWN BY: JH





Pennine Way

AM Peak Hour 08:00 to 09:00

Bitterscote Drive

B5440 Marlborough Way

A5 Fazeley - Two Gates - Wilnecote Bypass

A5 Fazeley - Two Gates - Wilnecote Bypass

M42 Junct 10

B5440 Marlborough Way

B5404 Quarry Hill

Centurion Way

717
300

680 350

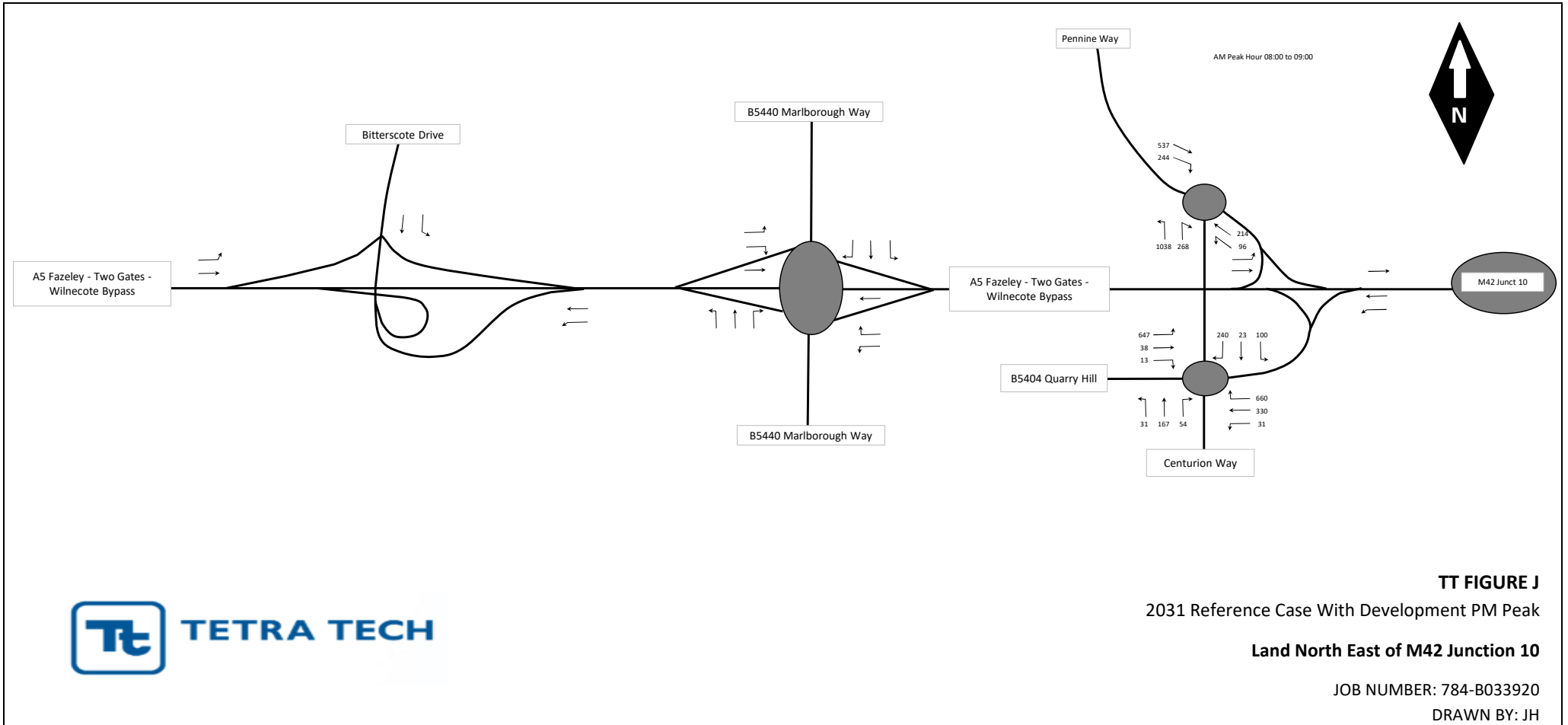
36
30

635
73
45

216 89 114

18 61 13

395
278
115



A5 Fazeley - Two Gates - Wilnecote Bypass

Bitterscote Drive

B5440 Marlborough Way

Pennine Way

A5 Fazeley - Two Gates - Wilnecote Bypass

M42 Junct 10

B5440 Marlborough Way

B5404 Quarry Hill

Centurion Way

AM Peak Hour 08:00 to 09:00

537
244

1038 268

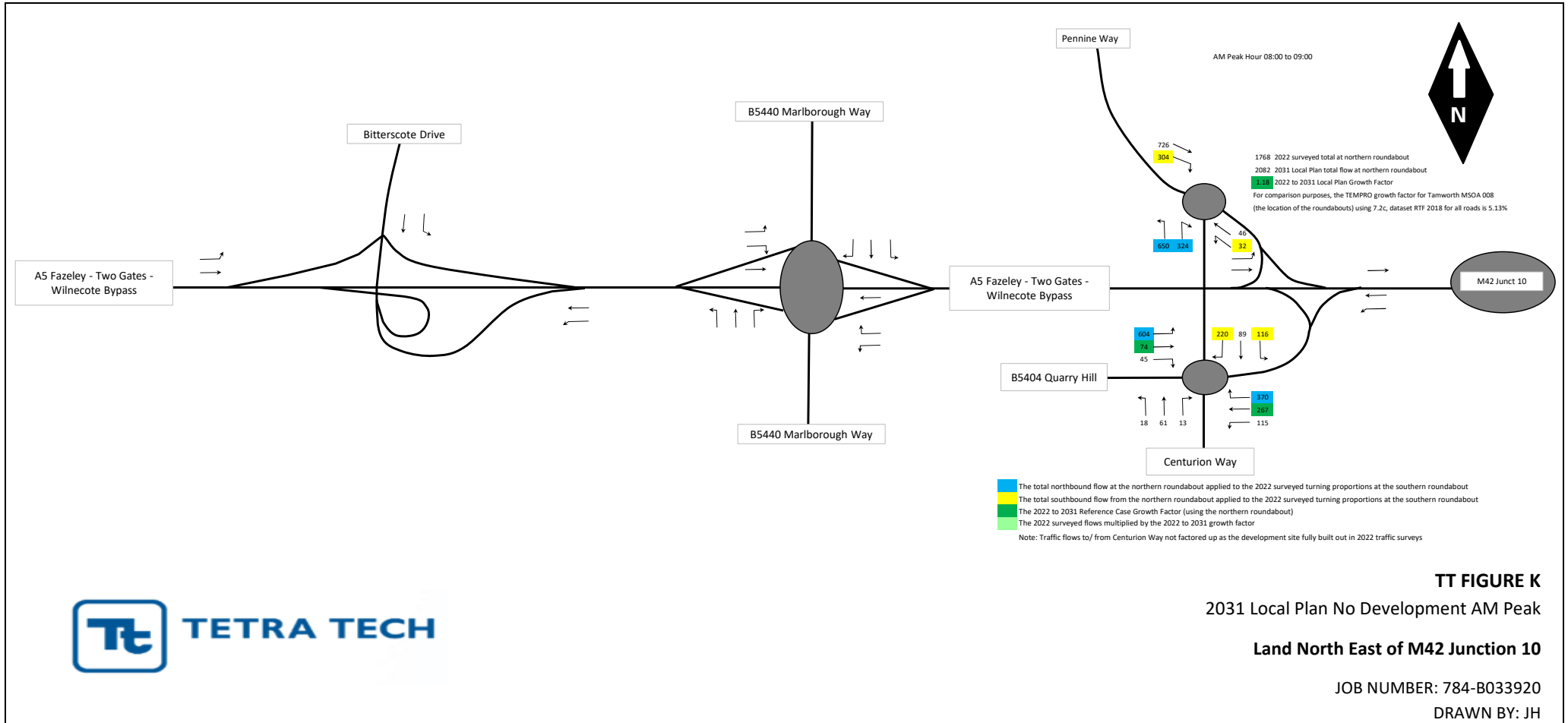
214
96

647
38
13

240 23 100

31 167 54

660
330
31



TT FIGURE K

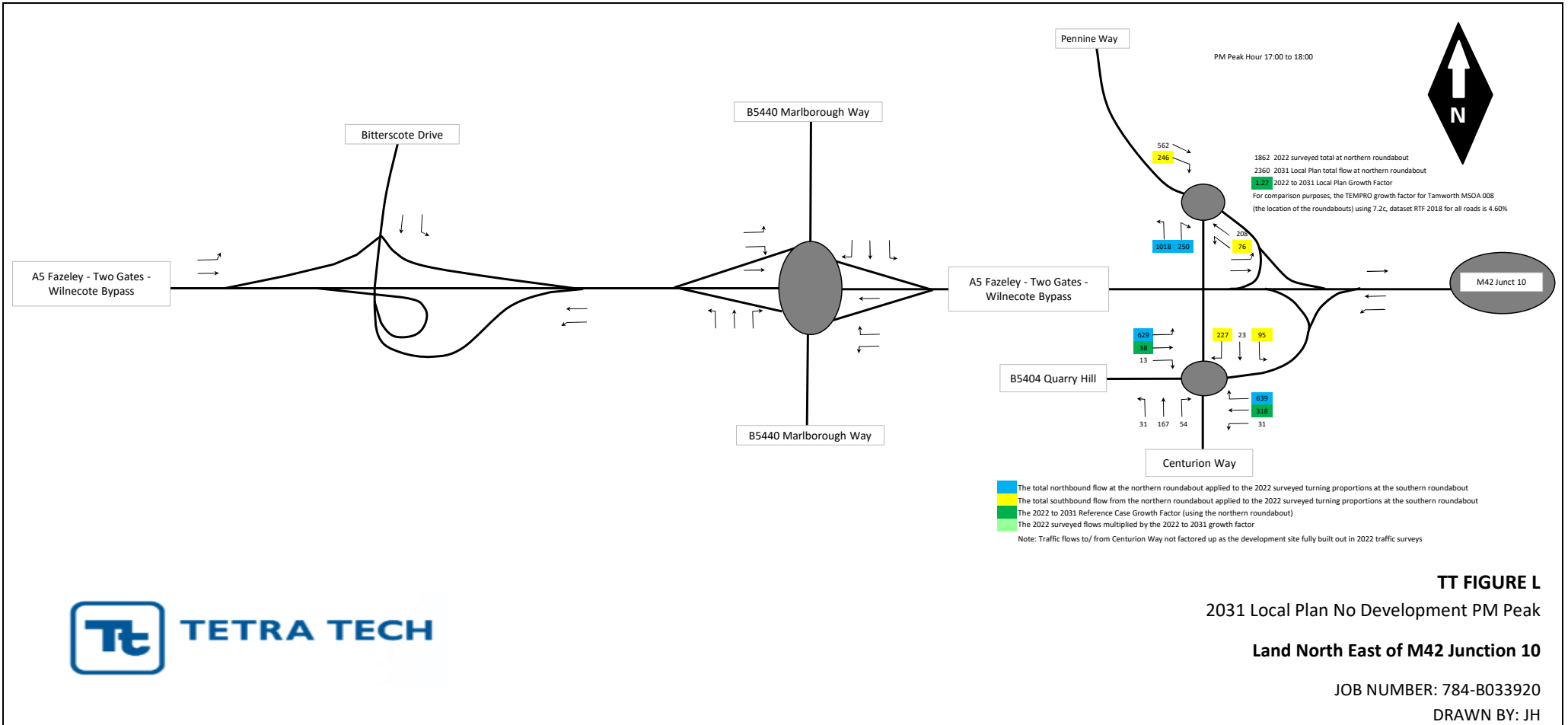
2031 Local Plan No Development AM Peak

Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

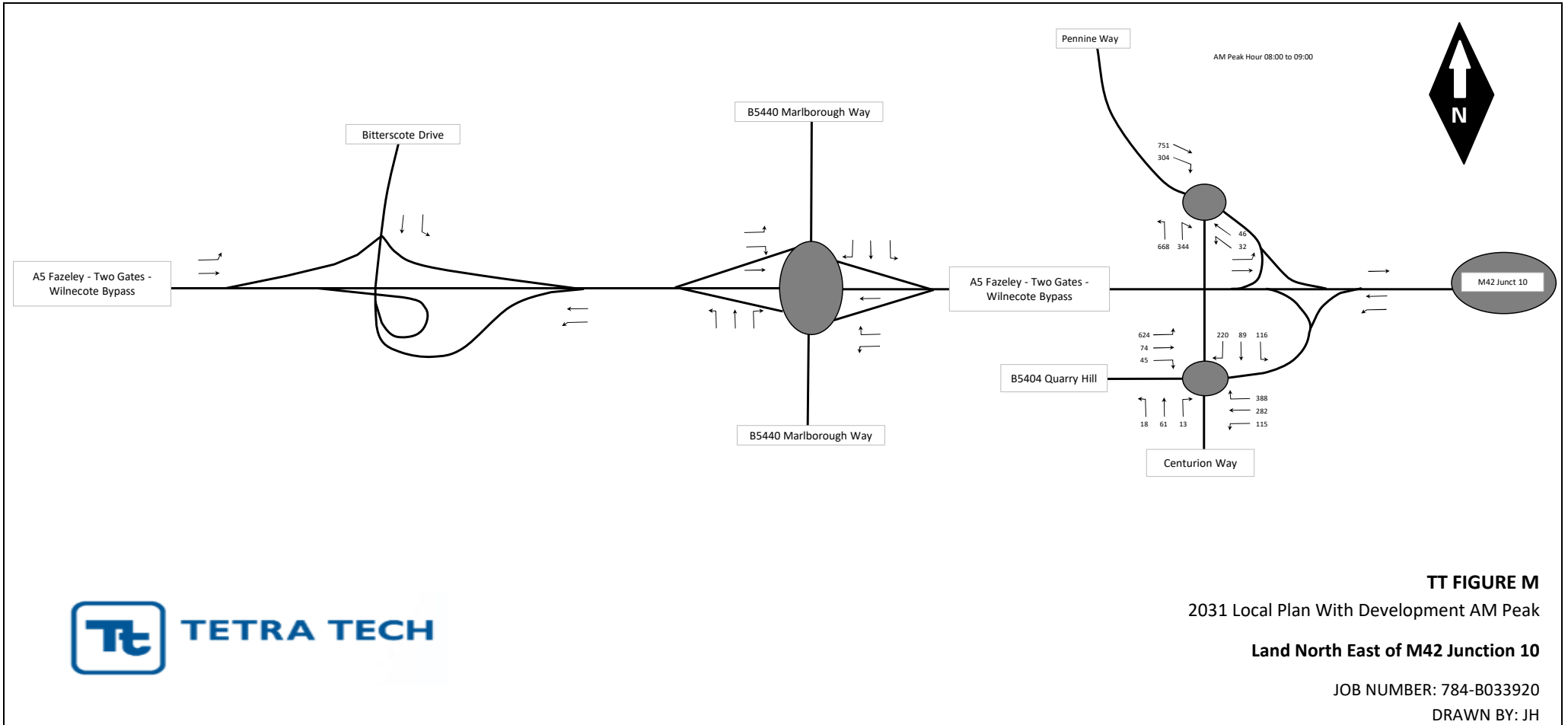
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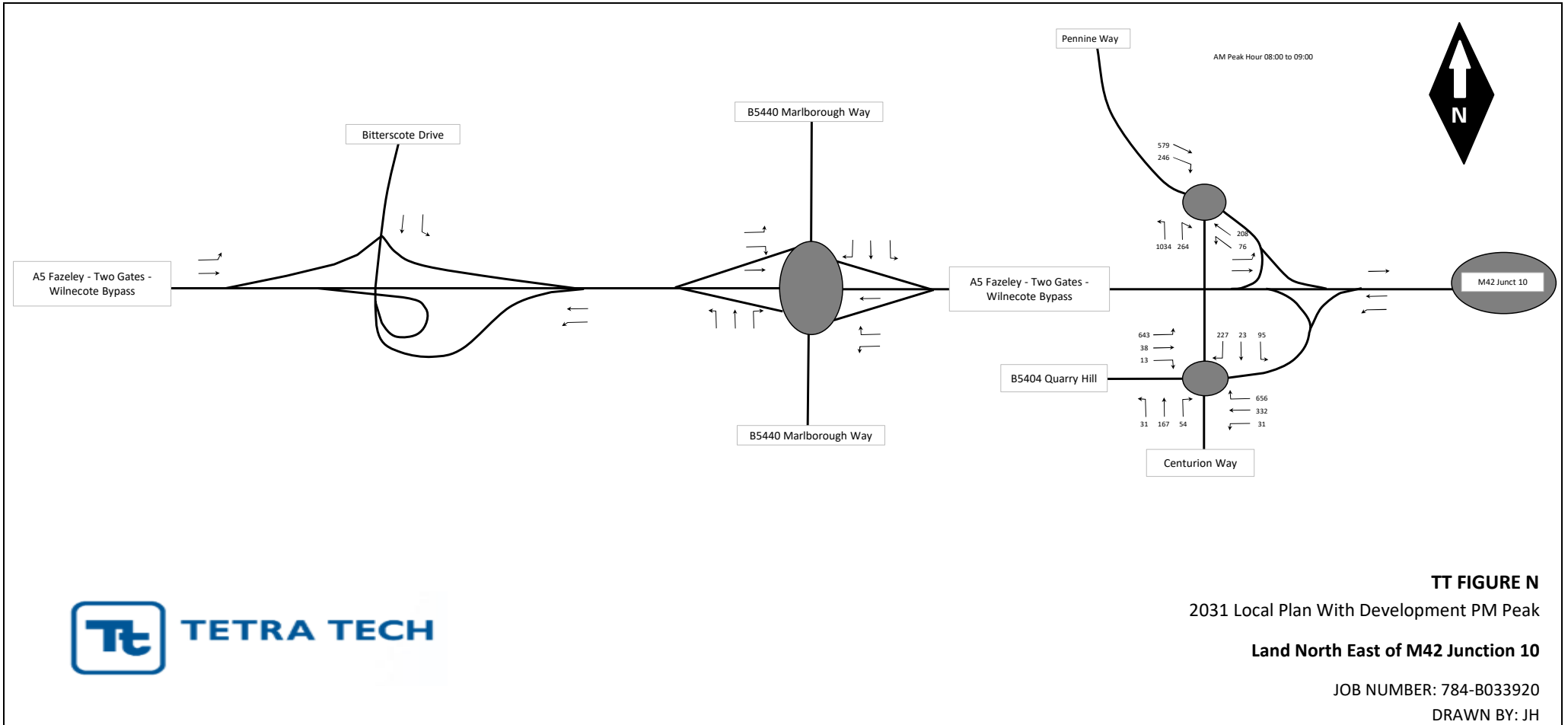
TT FIGURE L
 2031 Local Plan No Development PM Peak
 Land North East of M42 Junction 10

JOB NUMBER: 784-B033920
 DRAWN BY: JH



TT FIGURE M
 2031 Local Plan With Development AM Peak
Land North East of M42 Junction 10

JOB NUMBER: 784-B033920
 DRAWN BY: JH



TT FIGURE N

2031 Local Plan With Development PM Peak

Land North East of M42 Junction 10

JOB NUMBER: 784-B033920

DRAWN BY: JH

784-B033920
Land Northeast of M42 Junction 10
Pennine Way Roundabouts Modelling Note



Client: Hodgetts Estates

Date: 23 November 2022

APPENDIX B – QUEUE OBSERVATIONS

784-B033920
Land Northeast of M42 Junction 10
Pennine Way Roundabouts Modelling Note



Client: Hodgetts Estates

Date: 23 November 2022

APPENDIX C – CORRESPONDENCE WITH SCC

Wakenshaw, Gareth

From: Mudhar, Amrit [REDACTED]
Sent: 16 November 2022 09:49
To: Wakenshaw, Gareth; Bunn, Nick; [REDACTED]
Cc: Andrew Collinson; Jarvis, Jon (E,I&S); Simm, Ben; Tony Burrows; Evans, Mark (E,I&S)
Subject: RE: RE: Land NE of M42 (PAP/2021/0663) [Filed 16 Nov 2022 09:56]

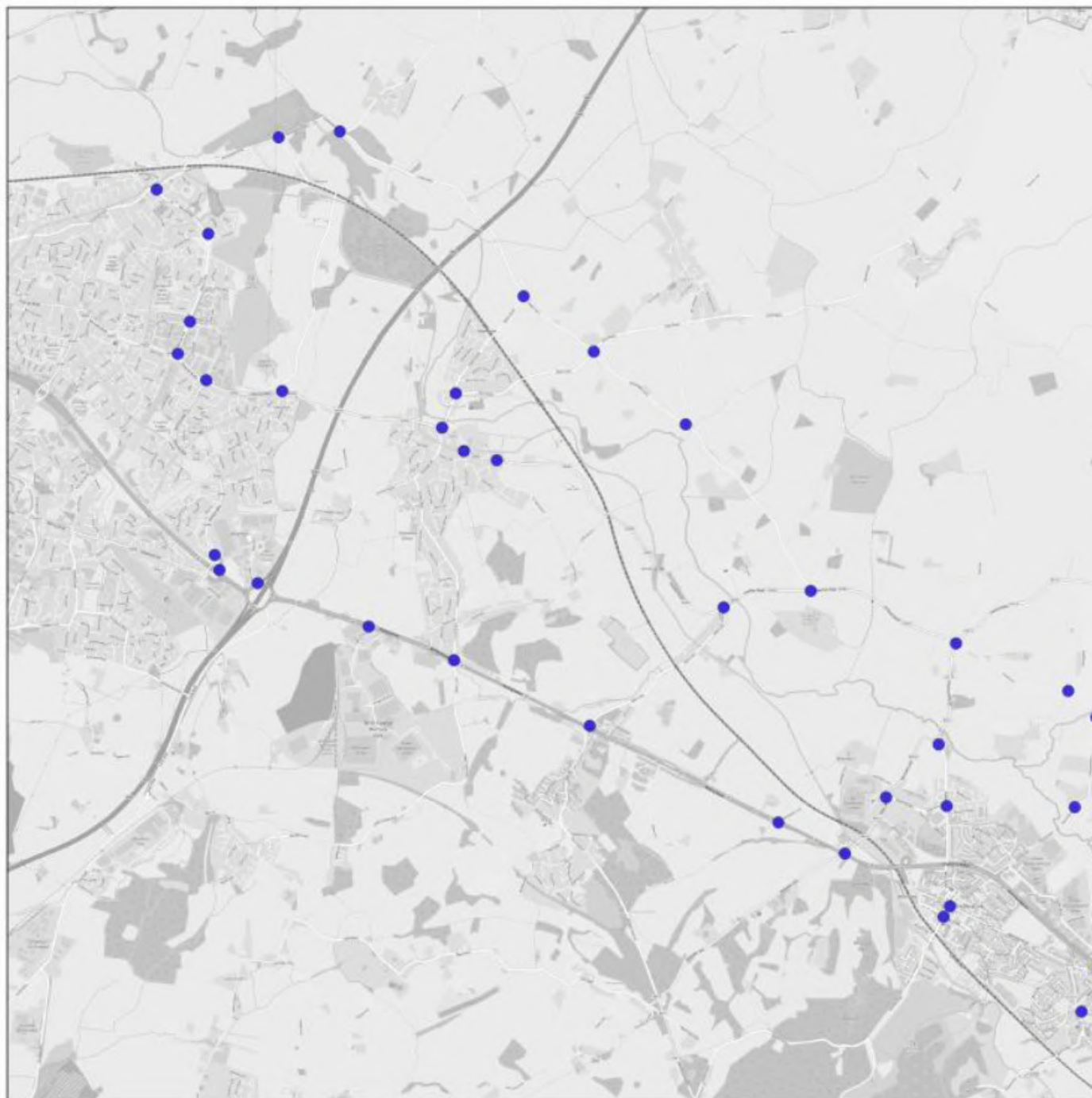
Hi all,

We have now reviewed the email and attachments sent on 14 October 2022. The distribution based on 2011 Census journey to work data is acceptable and we agree with the proposed approach to modelling the Pennine Way junctions, with no further assessment required for any of the other junctions on the Staffordshire network, based on the development flows which were submitted. 2011 Census data has also been used to inform the distribution in the Atherstone A5 model so this approach is consistent.

I am a bit surprised that the study area shown in the Atherstone A5 Model LMVR was not used to inform the junctions requiring assessment within Staffordshire as the reason for their inclusion was to assess cross boundary traffic impacts. Please see Figure 2 below which I have extracted from the LMVR.

Once the baseline model has been updated to include the Pennine Way junctions, please could we arrange to see a demonstration of the TRANSYT model working as we are unable to review TRANSYT models. As the model is a linked junction, depending on how the outputs are presented, there may not be a need for Junctions 9/10 modelling of the Pennine Way junctions. It will be more helpful to see the operation of these junctions as part of the network that is being assessed.

Figure 2 – Junction Count Survey Locations



Kind regards,
Amrit



Miss Amrit Mudhar | Project Engineer
Sustainable Development Team - Highways and Built County
Third Floor, Staffordshire Place 1
Tipping Street, Stafford ST16 2DH

From: [REDACTED]
Sent: 09 November 2022 12:10

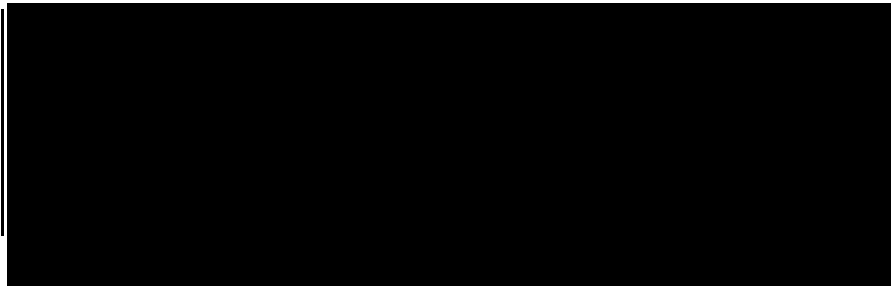
To: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Hi all,

Apologies for the delay responding to you. I have been out of the office a fair bit recently dealing with a personal matter. I will be returning to work full time next week and should be able to provide a response to the additional information that has been sent through.

David, I picked up your voicemail today and will give you a call once I have been through the additional information.

Kind regards,
Amrit



From: Wakenshaw, Gareth [REDACTED]
Sent: 02 November 2022 10:03
To: Mudhar, Amrit (E,I&S) [REDACTED]; Evans, Mark (E,I&S) [REDACTED]
[REDACTED]; Bunn, Nick [REDACTED]; Andrew Collinson [REDACTED]; Jarvis, Jon (E,I&S) <[REDACTED]>
Subject: FW: Land NE of M42

CAUTION: This email originated from outside of Staffordshire County Council. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Amrit,

Hope you are well.

Just wondering if you have had chance to review the email and attached documents, do you think you would be able to provide a response by the end of the week?

We are progressing the modelling work of the South Pennine Way roundabouts and will soon be using the Vectos PARAMICS traffic flows to assess the future year scenarios (No Development) and then add on the development generated flows based on my email below to assess the impacts of the development. It would be great if we could have your acceptance of the development generated traffic flows to save any abortive work.

Kind Regards

Gareth Wakenshaw
Principal Transport Planner

Tetra Tech

4th Floor, Rotterdam House, 116 Quayside, Newcastle Upon Tyne, NE1 3DY

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Tetra Tech Limited. Registered in England number: 1959704
Registered Office: 3 Sovereign Square, Sovereign Street, Leeds LS1 4ER
VAT No: 431-0326-08.



TETRA TECH



From: Wakenshaw, Gareth
Sent: 14 October 2022 09:00

To: Mudhar, Amrit (E,I&S)

Subject: RE: Land NE of M42 [Filed 14 Oct 2022 09:00]

Hi Amrit,

Following my email last week a TT representative attended site on Tuesday 11th at 8am to observe the roadworks on Quarry Hill. The roadworks shown on the map further below were due to start on Monday 3rd October and end around 23rd December. Our TT representative saw no sign of roadworks at these locations, see attached photos at Stonydelph and near Wilnecote Fish Bar. I also contacted Western Power Distribution and they confirmed the roadworks have been delayed by two weeks, starting on Monday 17th October, see attached email. I trust this gives you comfort the surveys undertaken are acceptable.

SCC Traffic Distribution & Assignment Work

With regards to the traffic distribution and assignment work, please see attached our excel document. We chose North Warwickshire MSOA 002 as the place of work (the area the proposed development sits within) and sieved out all those areas where traffic would not travel through the SCC network. This filtering process left those areas where traffic would use the A5 Wilnecote Bypass. Below as a description of each tab in the excel document.

- 1st tab – this shows the filtered MSOA’s and the total number of car drivers. Six routes have been allocated (A to F) to assign the trips through the network.
- 2nd tab – this shows the six routes, A to F diagrammatically on the network, focusing on the South Pennine Way roundabouts, the A5/ B5440 Marlborough Interchange and the A5/ Bitterscote Drive interchange.
- 3rd tab- this shows the resultant traffic assignment %age which links back to the 1st tab.
- 4th tab – this shows the AM Peak development generated traffic flows on the SCC network. As previously identified (see attached email) the AM and PM peak hour traffic flows at the A5 immediately west of Junction 10 and at Junction 10 have been agreed with National Highways. We have therefore applied the traffic assignment % to these flows.
- 5th tab – this shows the PM peak hour equivalent.

As you can see from the predicted traffic flows, the development has a small impact at the Pennine Way roundabouts in the AM peak with 33 trips on the westbound approach to the southern roundabout and 38 at the southern approach to the northern roundabout. The volumes are lower in the PM peak. The forthcoming junction assessment of the two roundabouts is therefore considered reasonable and will be assessed as agreed and included

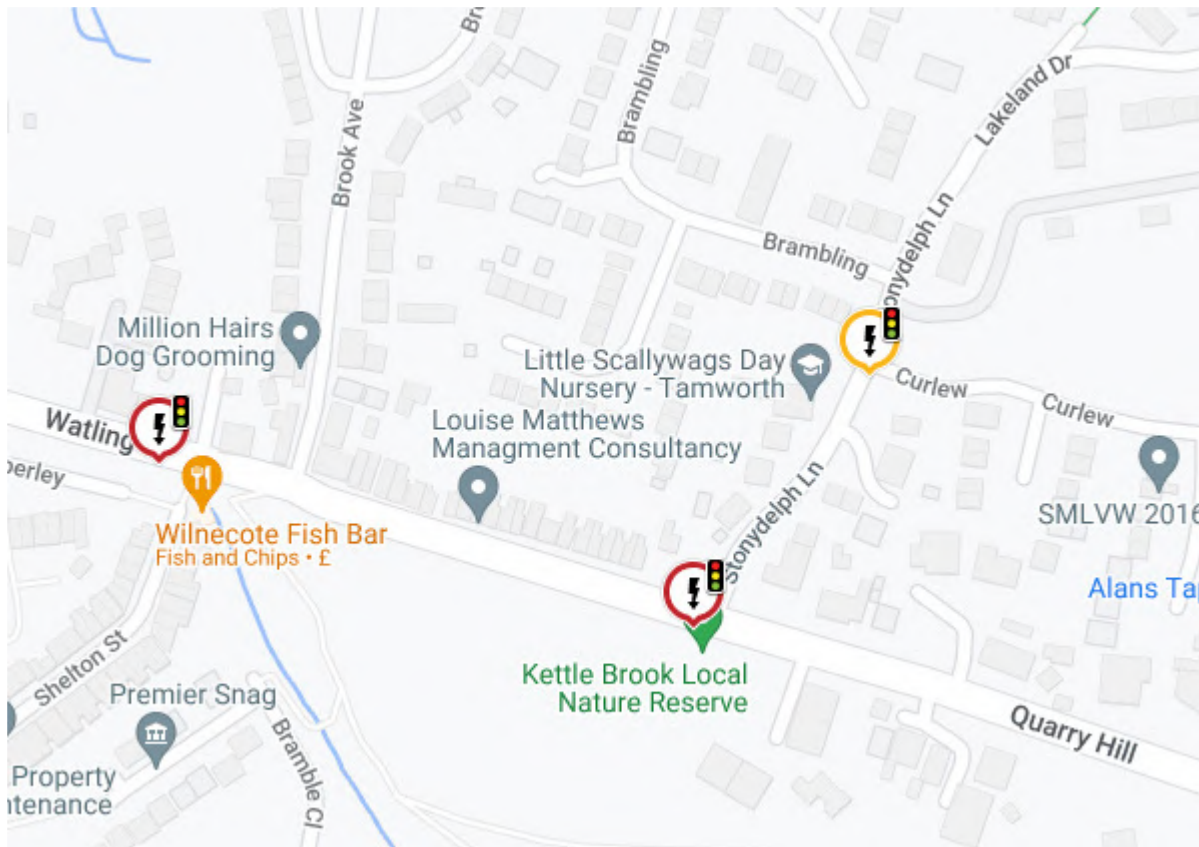
in our TA. The junctions will be modelled as a linked model in Junctions 10 using lane simulation to model the effects of any blocking back effects.

At the B5440 Marlborough Way Interchange the highest approach flow on any approach is 22 in the AM peak. The flows are lower in the PM peak. No assessment is considered necessary.

At the Bitterscote Drive interchange the highest approach flow on any approach is 11 in the AM peak. The flows are lower in the PM peak. No assessment is considered necessary.

It would be appreciated if you could confirm the assignment is acceptable before we assess the future performance of the Pennine Way roundabouts.

Kind Regards



Gareth Wakenshaw
Principal Transport Planner

Gareth Wakenshaw
Principal Transport Planner

Tetra Tech



Tetra Tech Limited. Registered in England number: 1959704
Registered Office: 3 Sovereign Square, Sovereign Street, Leeds LS1 4ER
VAT No: 431-0326-08.



TETRA TECH



From: Wakenshaw, Gareth
Sent: 06 October 2022 15:04

To: Mudhar, Amrit (E,I&S) <a [REDACTED]>
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Hi Amrit,

Thanks for your email. Time was of the essence for the order, we couldn't wait until next year to undertake the surveys (roadworks you refer to ending 23rd December). Our survey firm say they checked for roadworks and it appears they missed them. I first emailed you of the forthcoming surveys on 26th September and as we had no response it was assumed the surveys were acceptable.

Notwithstanding the above remember we are using the surveys to validate the junction models rather than use the data for future year assessments. We will be validating the 2 roundabouts in Junctions 10, using lane simulation to model any blocking back effects and unequal lane usage, to demonstrate for the traffic volumes surveyed the modelled queues reflect those recorded on the ground. Once the model is validated we will be replacing the 2022 surveyed flows with future year traffic flows, extracted from the Vectos Paramics A5 model (following the same methodology we have agreed with NH and WCC for the A5 TRANSYT model). To confirm we won't be using the surveys and manually adding on traffic growth, committed, Local Plan and development generated flows in the traditional way. They are being used for model validation purposes only.

For your info, we are obtaining the 2026 and 2031 No Development flows from Vectos, we will then manually add on the development generated traffic using the Census Journey to Work data as you have discussed with Nick Bunn previously. We were going to send the assignment and distribution of development traffic to you for approval, but it sounds like you would like us to submit everything in one package, unless you are ok to review the assignment separately in advance?

Kind Regards

Gareth Wakenshaw
Principal Transport Planner

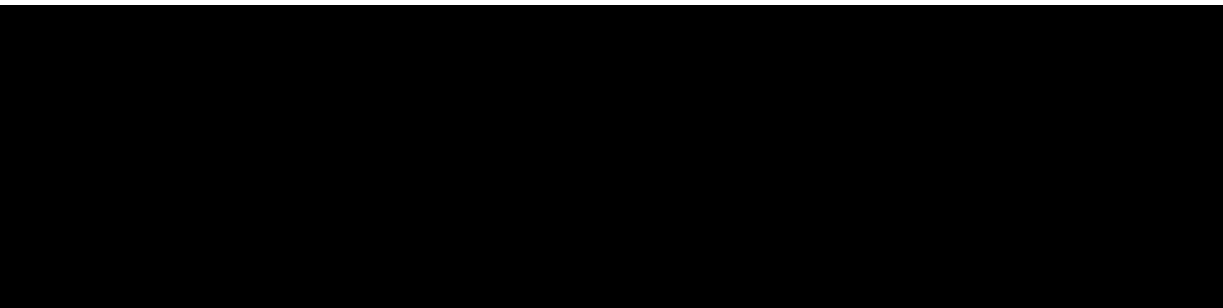
Tetra Tech

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

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VAT No: 431-0326-08.



TETRA TECH



[REDACTED]
Subject: RE: Land NE of M42 [Filed 06 Oct 2022 09:01]

Hi Gareth,

Many thanks for your email. It's a shame the surveys weren't undertaken slightly sooner as it appears that there are temporary traffic lights in place along the B5404 which were installed on Monday and are due to remain until the end of the year (according to one.network). This is something that should have been checked by your survey company or yourselves before commissioning/ confirming the date of traffic surveys.

If you have access to any existing data in this area it would be helpful to undertake a validation exercise to show that routeing has not been impacted significantly by the road works. If existing data is not available, then please include a justification in any future Technical Note/ updated Transport Assessment as to why the data collected is acceptable, especially as the survey day is towards the beginning of the temporary traffic light installation period. I am just trying to anticipate some of the feedback that may be received with regards to traffic impact. Unfortunately, we do not have any existing count data available which could be used as part of the validation exercise.

Could I also request that any further submission of data for review is packaged up rather than sent through ad-hoc as my case load is extremely high and I am struggling to get responses out. I will aim to respond in line with our 21-day response period.

Kind regards,
Amrit



Miss Amrit Mudhar | Project Engineer
Sustainable Development Team - Highways and Built County
Third Floor, Staffordshire Place 1
Tipping Street, Stafford ST16 2DH



From: Wakenshaw, Gareth [REDACTED]
[REDACTED]

To: Mudhar, Amrit (E,I&S) <[REDACTED]>
[REDACTED]
[REDACTED]
[REDACTED]

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Hi Amrit,

Just letting you know that the two Pennine Way roundabout junctions are being surveyed on Wednesday 5th October. Trust this is ok.

Kind Regards

Gareth Wakenshaw
Principal Transport Planner

Tetra Tech
4th Floor, Rotterdam House, 116 Quayside, Newcastle Upon Tyne, NE1 3DY

[tetratecheurope.com](https://www.tetratecheurope.com)

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TETRA TECH



Mark (E,I&S)

Subject: RE: Land NE of M42 [Filed 26 Sep 2022 11:58]

Hi Amrit,

Just letting you know that we have instructed a firm to survey the two Pennine Way roundabout junctions on Wednesday 5th October as per the following spec, trust this is acceptable.

Classified Turning Count and Queue Length Surveys

- The two junctions are to be captured by camera.
- The survey/report hours are to be for a neutral weekday 07:00-09:30 and 16:00-18:30 (5hrs).
- Vehicle count classifications to include pedal cycles, power two-wheelers, cars, LGVs, OGV1, OGV2, PSV, plus PCU values.
- Count data is to be tabulated on .xlsx and summarised in 15-minute and hourly periods.
- Snapshot queue lengths are to be provided by lane on each approach road at 1-minute intervals.
- Queue lengths will be recorded as the number of vehicles when vehicles are stationary, or close to stationary.



Kind Regards

Gareth Wakenshaw
Principal Transport Planner

Tetra Tech



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From: Bunn, Nick

Sent: 09 September 2022 14:29

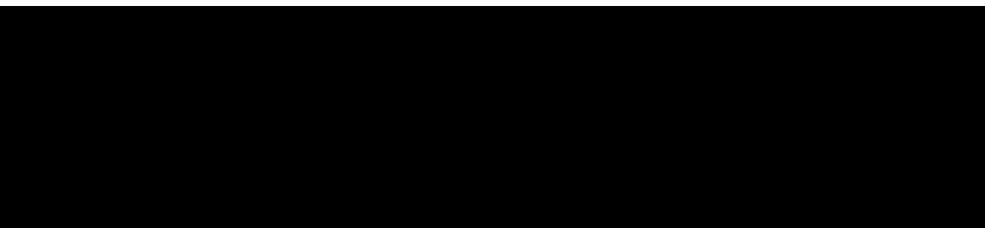
To: 'Mudhar, Amrit' [redacted]
[redacted]
[redacted]
[redacted]

Hi Amrit and Mark

When discussing the meeting with david this afternoon – I realised that I had omitted a couple points.. amended notes below

- Prepare an assignment for the Dev Gen trips into Tamworth. At the meeting we did not expect the impacts elsewhere in Tamworth to require investigation – subject to the assignment process. As discussed we'll use Census journey to work data. Once done we'll forward to you for agreement.
- Assess the impact at the Pennine Way N and S roundabouts. Amrit requested that id model files are submitted that these are in Junctions 9 format
- Arrange traffic survey for the above two junctions
- Discuss the Jn10 improvement works with SCC – particularly the ped/ cycle connections into Tamworth
- There were no extant planning permission which would affect the traffic flows at the Pennine Way roundabouts

Dr Nick Bunn BSc(Hons) PhD MSc MCIHT CMLT
Director
Pronouns: he, him, his



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From: Bunn, Nick

Sent: 09 September 2022 12:53

To: Mudhar, Amrit (E,I&S) [redacted]
[redacted]
[redacted]

Subject: Land NE of M42

Hi Amrit and Mark

Thanks for meeting with me today. Brief notes below – do let me know if I have missed anything
As agreed we will.

- Prepare an assignment for the Dev Gen trips into Tamworth. At the meeting we did not expect the impacts elsewhere in Tamworth to require investigation – subject to the assignment process. Once done we'll forward to you for agreement.
- Assess the impact at the Pennine Way N and S roundabouts. Amrit requested that id model files are submitted that these are in Jnctions 9 format
- Arrange traffic survey for the above two junctions
- Discuss the Jn10 improvement works with SCC – particularly the ped/ cycle connections into Tamworth

We will endeavour to keep you in the loop as things develop or if there are further site visits.

Dr Nick Bunn BSc(Hons) PhD MSc MCIHT CMLT

Director

Pronouns: he, him, his

Tetra Tech

4th Floor, Rotterdam House, 116 Quayside, Newcastle Upon Tyne, NE1 3DY



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784-B033920
Land Northeast of M42 Junction 10
Pennine Way Roundabouts Modelling Note



Client: Hodgetts Estates

Date: 23 November 2022

APPENDIX D – CENSUS 2011 JOURNEY TO WORK DATA

Table 1 - Census 2011 Journey to Work (North Warwickshire MSOA 002)

Origin	Car Drivers	Route							
		A	B	C	D	E	F		
E02006217 : Tamworth 001	91	68.25	22.75						
E02006218 : Tamworth 002	90	45		90					
E02006219 : Tamworth 003	122		91.5	30.5					
E02006220 : Tamworth 004	107		53.5	53.5					
E02006221 : Tamworth 005	108			54	54				
E02006222 : Tamworth 006	122			48.8		73.2			
E02006223 : Tamworth 007	122		61	61					
E02006224 : Tamworth 008	172		137.6		34.4				
E02006225 : Tamworth 009	133				133				
E02006226 : Tamworth 010	172				86			50% via Trinity Way	
E02006146 : Lichfield 001	10						10		
E02006147 : Lichfield 002	15						15		
E02006148 : Lichfield 003	8						8		
E02006149 : Lichfield 004	13						13		
E02006150 : Lichfield 005	19	19							
E02006151 : Lichfield 006	19						19		
E02006152 : Lichfield 007	15						15		
E02006153 : Lichfield 008	30	30							
E02006154 : Lichfield 009	14						14		
E02006155 : Lichfield 010	8						8		
E02006156 : Lichfield 011	5						5		
E02006157 : Lichfield 012	58		11.6				46.4		
E02001827 : Birmingham 001	3						3		
E02001828 : Birmingham 002	9						9		
E02001829 : Birmingham 003	12						12		
E02001830 : Birmingham 004	3						3		
E02001831 : Birmingham 005	15				5		5	33% via M42	
E02001832 : Birmingham 006	7						3.5	50% via M42	
E02006118 : Cannock Chase 001	4						4		
E02006119 : Cannock Chase 002	4						4		
E02006120 : Cannock Chase 003	11						11		
E02006121 : Cannock Chase 004	4						4		
E02006122 : Cannock Chase 005	4						4		
E02006123 : Cannock Chase 006	6						6		
E02006124 : Cannock Chase 007	5						5		
E02006125 : Cannock Chase 008	5						5		
E02006126 : Cannock Chase 009	11						11		
E02006127 : Cannock Chase 010	5						5		
E02006128 : Cannock Chase 011	8						8		
E02006129 : Cannock Chase 012	2						2		
E02006130 : Cannock Chase 013	7						7		
E02002110 : Walsall 001	9						9		
E02002111 : Walsall 002	9						9		
E02002112 : Walsall 003	3						3		
E02002113 : Walsall 004	5						5		
E02002116 : Walsall 007	5						5		
E02002119 : Walsall 010	10						10		
	1619	162.25	377.95	337.8	312.4	73.2	305.9	1570	revised total (excludes traffic not on SCC network)
Percentages of development traffic		10.3%	24.1%	21.5%	19.9%	4.7%	19.5%		
		A	B	C	D	E	F		

784-B033920
Land Northeast of M42 Junction 10
Pennine Way Roundabouts Modelling Note



Client: Hodgetts Estates

Date: 23 November 2022

APPENDIX E – JUNCTIONS 9 OUTPUT FILES

<h1>Junctions 9</h1>
<h2>ARCADY 9 - Roundabout Module</h2>
Version: 9.5.1.7462 © Copyright TRL Limited, 2019
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk
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Filename: m42 pennine way.j9

Path: \\lds-dc-vm-101\Data\Projects\784-B033920 Land NE of M42 Jn10\50 Project Input\52 Generated Data\Traffic Models\South Pennine Way Roundabouts

Report generation date: 23/11/2022 10:28:09

«2031 Reference Case With Dev, PM

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

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
[Lane Simulation] - 2022										
Junction 1 - Arm 1	D1	1.0	3.63		A	D2	1.4	4.70		A
Junction 1 - Arm 2		2.4	9.22		A		1.2	6.21		A
Junction 1 - Arm 3		0.2	4.33		A		0.5	4.39		A
Junction 2 - Arm 1		1.3	7.40		A		1.5	9.41		A
Junction 2 - Arm 2		0.9	6.10		A		0.7	5.21		A
Junction 2 - Arm 3		1.9	8.51		A		2.1	9.41		A
Junction 2 - Arm 4		0.2	5.56		A		0.7	6.29		A
[Lane Simulation] - 2031 Reference Case No Dev										
Junction 1 - Arm 1	D3	1.4	4.24		A	D4	5.9	12.94		B
Junction 1 - Arm 2		6.9	22.55		C		2.3	8.68		A
Junction 1 - Arm 3		0.1	3.80		A		0.4	4.38		A
Junction 2 - Arm 1		4.0	16.53		C		11.7	52.26		F
Junction 2 - Arm 2		0.5	5.15		A		0.5	5.06		A
Junction 2 - Arm 3		2.3	9.28		A		7.5	23.95		C
Junction 2 - Arm 4		0.2	5.59		A		0.7	8.08		A
[Lane Simulation] - 2031 Reference Case With Dev										
Junction 1 - Arm 1	D5	1.7	4.42		A	D6	6.4	13.65		B
Junction 1 - Arm 2		10.4	32.23		D		2.4	9.48		A
Junction 1 - Arm 3		0.1	3.81		A		0.5	4.33		A
Junction 2 - Arm 1		5.2	20.07		C		13.8	62.72		F
Junction 2 - Arm 2		0.6	4.93		A		0.6	5.02		A
Junction 2 - Arm 3		2.4	8.93		A		9.1	27.59		D
Junction 2 - Arm 4		0.3	5.82		A		0.8	8.47		A
[Lane Simulation] - 2031 Local Plan No Dev										
Junction 1 - Arm 1	D7	1.4	4.31		A	D8	5.5	13.46		B
Junction 1 - Arm 2		9.5	29.18		D		2.8	10.40		B
Junction 1 - Arm 3		0.1	3.81		A		0.4	4.42		A
Junction 2 - Arm 1		3.8	16.41		C		10.3	51.25		F
Junction 2 - Arm 2		0.5	5.12		A		0.5	5.10		A
Junction 2 - Arm 3		2.0	8.99		A		7.6	24.77		C
Junction 2 - Arm 4		0.2	5.59		A		0.7	7.89		A
[Lane Simulation] - 2031 Local Plan With Dev										
Junction 1 - Arm 1	D9	1.5	4.41		A	D10	5.5	11.11		B
Junction 1 - Arm 2		14.4	41.89		E		2.8	10.92		B
Junction 1 - Arm 3		0.2	3.87		A		0.2	3.78		A
Junction 2 - Arm 1		4.6	18.64		C		14.1	60.03		F
Junction 2 - Arm 2		0.5	5.10		A		0.5	5.00		A
Junction 2 - Arm 3		2.3	9.49		A		7.8	22.80		C
Junction 2 - Arm 4		0.2	5.76		A		0.7	8.19		A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay.

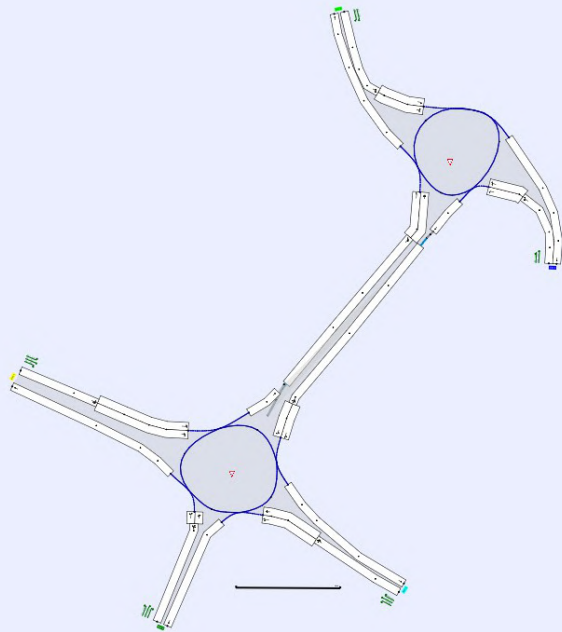
File summary

File Description

Title	
Location	
Site number	
Date	28/10/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	TT\JACK.HARDING
Description	

Units

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



Flows show original traffic demand (PCU/hr).
Lane simulation visualisation time: 15:45:00

The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	1	3	1	60	✓			1	210	29.30

Analysis Set Details

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

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2031 Reference Case With Dev	PM	ONE HOUR	15:45	17:15	15	✓

2031 Reference Case With Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	Junction 2 - Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	Junction 2 - Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	11.25	B
2	untitled	Standard Roundabout		1, 2, 3, 4	32.81	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Junction	Arm	Name	Description
1	1	untitled	
	2	untitled	
	3	untitled	
2	1	untitled	
	2	untitled	
	3	untitled	
	4	untitled	

Roundabout Geometry

Junction	Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	1	4.82	7.69	25.8	42.2	53.0	15.5	
	2	3.90	7.90	28.9	44.5	53.0	25.0	
	3	4.68	9.04	20.1	25.1	53.0	20.5	
2	1	4.22	7.60	44.4	27.4	51.5	7.0	
	2	5.08	7.83	5.0	38.7	51.5	17.5	
	3	4.34	6.49	31.0	30.9	51.5	22.5	
	4	6.41	8.13	6.4	20.1	51.5	16.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Junction	Arm	Final slope	Final intercept (PCU/hr)
1	1	0.720	2261
	2	0.683	2111
	3	0.716	2292
2	1	0.740	2298
	2	0.670	1963
	3	0.657	1928
	4	0.734	2331

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

Arm Capacity Adjustments

Junction	Arm	Type	Reason	Direct capacity adjustment (PCU/hr)
1	1	Direct	Queue Observations	475

Lane Simulation: Arm options

Junction	Arm	Lane capacity source	Traffic considering secondary lanes (%)
1	1	Evenly split	10.00
	2	Evenly split	10.00
	3	Evenly split	10.00
2	1	Evenly split	10.00
	2	Evenly split	10.00
	3	Evenly split	10.00
	4	Evenly split	10.00

Lanes

Junction	Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised	
1	1	Entry	1	1	2	✓	4.00		0	99999		
				2	1, 3	✓	4.00		0	99999		
		Exit	1	1	(1, 2, 3)	✓	16.00					
	2	Entry	1	1	3	✓	4.00		0	99999		
				2	1, 2	✓	4.00		0	99999		
		Exit	1	1	(1, 2, 3)		Infinity					
	3	Entry	1	1	1	✓	3.00		0	99999		
				2	2, 3	✓	3.00		0	99999		
		Exit	1	1	(1, 2, 3)		Infinity					
	2	1	Entry	1	1	2, 3	✓	8.00		0	99999	
					2	1, 4	✓	8.00		0	99999	
			Exit	1	1	(1, 2, 3, 4)		Infinity				
2		Entry	1	1	3, 4	✓	2.00		0	99999		
				2	1, 2	✓	3.00		0	99999		
		Exit	1	1	(1, 2, 3, 4)	✓	17.00					
3		Entry	1	1	1, 4	✓	5.00		0	99999		
				2	2, 3	✓	5.00		0	99999		
		Exit	1	1	(1, 2, 3, 4)		Infinity					
4		Entry	1	1	1, 2	✓	1.00		0	99999		
				2	3, 4	✓	1.00		0	99999		
		Exit	1	1	(1, 2, 3, 4)		Infinity					

Entry Lane slope and intercept

Junction	Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1	1	Entry	1	1	0.360	1131
				2	0.360	1131
	2	Entry	1	1	0.342	1056
				2	0.342	1056
	3	Entry	1	1	0.358	1146
				2	0.358	1146
2	1	Entry	1	1	0.370	1149
				2	0.370	1149
	2	Entry	1	1	0.335	981
				2	0.335	981
	3	Entry	1	1	0.328	964
				2	0.328	964
	4	Entry	1	1	0.367	1166
				2	0.367	1166

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				1	2	3
1	1	1	1		✓	
			2	✓		✓
		2	1	✓	✓	✓
	2	1	1			✓
			2	✓	✓	
		2	1	✓	✓	✓
	3	1	1	✓		
			2		✓	✓
		2	1	✓	✓	✓

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm			
				1	2	3	4
2	1	1	1		✓	✓	
			2	✓			✓
		2	1	✓	✓	✓	✓
	2	1	1			✓	✓
			2	✓	✓		
		2	1	✓	✓	✓	✓
	3	1	1	✓			✓
			2		✓	✓	
		2	1	✓	✓	✓	✓
	4	1	1	✓	✓		
			2			✓	✓
		2	1	✓	✓	✓	✓

Traffic Demand

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

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (PCU/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	1	2	2	Simple (vertical queueing)	Normal	0	100.00	
2	2	1	1	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	1	✓				
	2		ONE HOUR	✓	781	100.000
	3		ONE HOUR	✓	310	100.000
2	1		ONE HOUR	✓	698	100.000
	2	✓				
	3		ONE HOUR	✓	1021	100.000
	4		ONE HOUR	✓	252	100.000

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	1038	268
	2	244	0	537
	3	96	214	0

Proportions

		To		
		1	2	3
From	1	0.00	0.79	0.21
	2	0.31	0.00	0.69
	3	0.31	0.69	0.00

Junction 2

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	647	38	13
	2	240	0	100	23
	3	330	660	0	31
	4	31	167	54	0

Proportions

		To			
		1	2	3	4
From	1	0.00	0.93	0.05	0.02
	2	0.66	0.00	0.28	0.06
	3	0.32	0.65	0.00	0.03
	4	0.12	0.66	0.21	0.00

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

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

Average PCU Per Veh

		To		
		1	2	3
From	1	1.000	1.020	1.040
	2	1.010	1.000	1.020
	3	1.040	1.010	1.000

Junction 2

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	8
	2	0	0	1	13
	3	2	3	0	19
	4	0	7	4	0

Average PCU Per Veh

		To			
		1	2	3	4
From	1	1.000	1.000	1.000	1.080
	2	1.000	1.000	1.010	1.130
	3	1.020	1.030	1.000	1.190
	4	1.000	1.070	1.040	1.000

Detailed Demand Data

Demand for each time segment

Time Segment	Junction	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
15:45-16:00	1	1	983	983
		2	588	588
		3	233	233
	2	1	525	525
		2	273	273
		3	769	769
		4	190	190
16:00-16:15	1	1	1174	1174
		2	702	702
		3	279	279
	2	1	627	627
		2	326	326
		3	918	918
		4	227	227
16:15-16:30	1	1	1438	1438
		2	860	860
		3	341	341
	2	1	769	769
		2	400	400
		3	1124	1124
		4	277	277
16:30-16:45	1	1	1438	1438
		2	860	860
		3	341	341
	2	1	769	769
		2	400	400
		3	1124	1124
		4	277	277
16:45-17:00	1	1	1174	1174
		2	702	702
		3	279	279
	2	1	627	627
		2	326	326
		3	918	918
		4	227	227
17:00-17:15	1	1	983	983
		2	588	588
		3	233	233
	2	1	525	525
		2	273	273
		3	769	769
		4	190	190

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	1	13.65	6.4	B	1353	2030
	2	9.48	2.4	A	714	1071
	3	4.33	0.5	A	285	428
2	1	62.72	13.8	F	640	960
	2	5.02	0.6	A	308	462
	3	27.59	9.1	D	939	1408
	4	8.47	0.8	A	233	349

Main Results for each time segment

15:45 - 16:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	1	1115	279	156	1120	1102	258	0.0	1.5	5.142	A
	2	597	149	227	598	586	1049	0.0	0.9	5.849	A
	3	229	57	185	228	233	639	0.0	0.3	3.901	A
2	1	529	132	663	530	526	441	0.0	1.2	9.155	A
	2	257	64	79	257	255	1115	0.0	0.3	4.472	A
	3	770	193	196	767	764	140	0.0	1.9	8.190	A
	4	193	48	913	192	192	51	0.0	0.3	5.646	A

16:00 - 16:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	1	1328	332	196	1320	1303	297	1.5	2.8	6.972	A
	2	692	173	267	696	698	1248	0.9	1.2	6.950	A
	3	283	71	212	281	280	751	0.3	0.3	4.143	A
2	1	618	154	799	620	618	521	1.2	2.6	14.007	B
	2	295	74	95	294	301	1324	0.3	0.4	4.674	A
	3	918	230	227	920	907	162	1.9	3.0	11.185	B
	4	229	57	1090	229	224	57	0.3	0.4	6.129	A

16:15 - 16:30

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	1	1599	400	232	1590	1557	373	2.8	6.4	11.727	B
	2	842	211	325	841	847	1497	1.2	2.2	8.970	A
	3	341	85	263	342	338	903	0.3	0.4	4.328	A
2	1	773	193	963	747	727	636	2.6	11.5	39.340	E
	2	370	93	115	369	368	1595	0.4	0.5	4.944	A
	3	1130	282	283	1117	1095	201	3.0	8.4	21.054	C
	4	275	69	1325	274	277	75	0.4	0.8	8.192	A

16:30 - 16:45

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	1	1615	404	238	1613	1614	370	6.4	6.2	13.647	B
	2	846	211	336	845	852	1516	2.2	2.4	9.481	A
	3	344	86	265	343	338	916	0.4	0.5	4.298	A
2	1	764	191	964	761	755	636	11.5	13.8	62.719	F
	2	367	92	115	365	368	1610	0.5	0.6	5.016	A
	3	1128	282	276	1119	1125	204	8.4	9.1	27.588	D
	4	275	69	1323	277	276	72	0.8	0.6	8.467	A

16:45 - 17:00

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	1	1351	338	192	1353	1403	307	6.2	2.9	8.513	A
	2	711	178	280	708	707	1265	2.4	1.6	7.216	A
	3	279	70	218	281	280	770	0.5	0.3	4.139	A
2	1	628	157	803	642	671	527	13.8	3.1	32.388	D
	2	304	76	100	303	304	1346	0.6	0.4	4.753	A
	3	921	230	232	926	945	170	9.1	2.7	13.866	B
	4	233	58	1098	233	229	61	0.6	0.4	6.568	A

17:00 - 17:15

Junction	Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Throughput (PCU/hr)	Average throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	1	1112	278	161	1113	1129	258	2.9	1.7	5.304	A
	2	597	149	227	597	592	1047	1.6	1.0	6.136	A
	3	237	59	184	235	234	640	0.3	0.3	3.890	A
2	1	525	131	666	523	533	433	3.1	1.4	9.897	A
	2	257	64	80	256	258	1109	0.4	0.4	4.491	A
	3	765	191	192	764	774	144	2.7	2.1	8.646	A
	4	191	48	908	191	190	48	0.4	0.3	5.708	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

15:45 - 16:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service	
1	1	Entry	1	1	2	888	1550	0.573	893	876	0.0	1.1	4.911	A	
				2	1, 3	227	1550	0.147	227	226	0.0	0.2	2.861	A	
		Exit	1	1	(1, 2, 3)		1115			1115	1107	0.0	0.2	0.640	A
							258			258	258	0.0	0.0	0.000	A
		2	Entry	1	1	3	413	978	0.422	412	401	0.0	0.8	6.117	A
						2	1, 2	185	978	0.189	185	184	0.0	0.2	4.561
	Exit		1	1	(1, 2, 3)		597			598	589	0.0	0.0	0.223	A
							1049			1049	1036	0.0	0.0	0.000	A
	3	Entry	1	1	1	73	1080	0.067	72	73	0.0	0.1	3.741	A	
					2	2, 3	156	1080	0.145	156	159	0.0	0.2	3.945	A
		Exit	1	1	(1, 2, 3)		229			229	234	0.0	0.0	0.019	A
							639			639	627	0.0	0.0	0.000	A
2	1	Entry	1	1	2, 3	518	903	0.573	519	516	0.0	1.2	9.139	A	
				2	1, 4	12	903	0.013	12	10	0.0	0.0	4.100	A	
		Exit	1	1	(1, 2, 3, 4)		529			530	531	0.0	0.0	0.107	A
							441			441	442	0.0	0.0	0.000	A
	2	Entry	1	1	3, 4	89	955	0.094	90	86	0.0	0.1	4.186	A	
					2	1, 2	167	955	0.175	167	168	0.0	0.2	4.546	A
		Exit	1	1	(1, 2, 3, 4)		257			257	256	0.0	0.0	0.046	A
							1115			1115	1106	0.0	0.0	0.000	A
	3	Entry	1	1	1, 4	272	900	0.303	271	273	0.0	0.5	6.072	A	
					2	2, 3	498	900	0.554	496	491	0.0	1.2	8.560	A
		Exit	1	1	(1, 2, 3, 4)		770			771	771	0.0	0.1	0.513	A
							140			140	138	0.0	0.0	0.000	A
	4	Entry	1	1	1, 2	152	831	0.183	151	152	0.0	0.2	4.661	A	
					2	3, 4	41	831	0.049	40	40	0.0	0.0	4.593	A
		Exit	1	1	(1, 2, 3, 4)		193			192	193	0.0	0.1	1.002	A
							51			51	50	0.0	0.0	0.000	A

16:00 - 16:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service	
1	1	Entry	1	1	2	1057	1535	0.689	1052	1038	1.1	1.9	5.725	A	
				2	1, 3	268	1535	0.174	267	264	0.2	0.3	2.979	A	
		Exit	2	1	(1, 2, 3)	1328			1325	1306	0.2	0.6	1.792	A	
	2	Entry	1	1	3	482	964	0.500	484	482	0.8	0.9	7.118	A	
					2	1, 2	211	964	0.219	212	216	0.2	0.3	4.876	A
			Exit	2	1	(1, 2, 3)	692			693	699	0.0	0.0	0.529	A
		3	Entry	1	1	1	86	1070	0.081	86	88	0.1	0.1	3.816	A
						2	2, 3	196	1070	0.184	196	193	0.2	0.2	4.233
			Exit	2	1	(1, 2, 3)	283			283	280	0.0	0.0	0.037	A
2	1	Entry	1	1	2, 3	607	853	0.711	609	606	1.2	2.3	13.322	B	
				2	1, 4	11	853	0.013	11	12	0.0	0.0	4.367	A	
		Exit	2	1	(1, 2, 3, 4)	618			618	622	0.0	0.2	0.805	A	
	2	Entry	1	1	3, 4	97	950	0.102	96	100	0.1	0.2	4.331	A	
					2	1, 2	198	950	0.208	198	201	0.2	0.2	4.725	A
			Exit	2	1	(1, 2, 3, 4)	295			295	301	0.0	0.0	0.077	A
		3	Entry	1	1	1, 4	322	889	0.361	322	322	0.5	0.6	6.922	A
						2	2, 3	598	889	0.673	598	584	1.2	1.9	10.721
			Exit	2	1	(1, 2, 3, 4)	918			920	910	0.1	0.5	1.798	A
	4	Entry	1	1	1, 2	180	766	0.235	179	176	0.2	0.3	4.821	A	
					2	3, 4	50	766	0.065	50	48	0.0	0.1	4.787	A
		Exit	1	1	(1, 2, 3, 4)	229			230	224	0.1	0.1	1.316	A	
1					1		57			57	58	0.0	0.0	0.000	A

16:15 - 16:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service	
1	1	Entry	1	1	2	1267	1522	0.832	1265	1237	1.9	2.7	7.092	A	
				2	1, 3	325	1522	0.213	325	320	0.3	0.3	3.209	A	
		Exit	2	1	(1, 2, 3)	1599			1591	1560	0.6	3.4	5.411	A	
	2	Entry	1	1	3	577	945	0.611	578	583	0.9	1.3	8.430	A	
					2	1, 2	264	945	0.279	263	265	0.3	0.5	5.349	A
			Exit	2	1	(1, 2, 3)	842			841	850	0.0	0.4	1.502	A
		3	Entry	1	1	1	109	1052	0.104	110	107	0.1	0.1	4.041	A
						2	2, 3	232	1052	0.220	232	232	0.2	0.3	4.368
			Exit	2	1	(1, 2, 3)	341			341	338	0.0	0.0	0.060	A
2	1	Entry	1	1	2, 3	739	793	0.932	732	714	2.3	6.0	24.842	C	
				2	1, 4	15	793	0.019	15	14	0.0	0.0	4.930	A	
		Exit	2	1	(1, 2, 3, 4)	773			754	742	0.2	5.5	14.522	B	
	2	Entry	1	1	3, 4	128	943	0.136	127	126	0.2	0.2	4.355	A	
					2	1, 2	242	943	0.257	242	242	0.2	0.3	5.048	A
			Exit	2	1	(1, 2, 3, 4)	370			370	369	0.0	0.0	0.127	A
		3	Entry	1	1	1, 4	394	871	0.452	393	386	0.6	1.0	8.105	A
						2	2, 3	724	871	0.831	724	710	1.9	3.0	14.083
			Exit	2	1	(1, 2, 3, 4)	1130			1117	1101	0.5	4.5	9.013	A
	4	Entry	1	1	1, 2	214	679	0.315	214	219	0.3	0.4	5.498	A	
					2	3, 4	59	679	0.087	59	59	0.1	0.1	5.457	A
		Exit	1	1	(1, 2, 3, 4)	275			273	278	0.1	0.3	2.699	A	
1					1		75			75	71	0.0	0.0	0.000	A

16:30 - 16:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service	
1	1	Entry	1	1	2	1277	1520	0.840	1278	1280	2.7	2.7	7.403	A	
				2	1, 3	337	1520	0.222	336	334	0.3	0.4	3.221	A	
		Exit	2	1	(1, 2, 3)	1615			1614	1615	3.4	3.1	7.096	A	
	2	Entry	1	1	3	580	941	0.616	580	586	1.3	1.4	8.659	A	
					2	1, 2	265	941	0.281	265	267	0.5	0.5	5.510	A
			Exit	2	1	(1, 2, 3)	846			844	853	0.4	0.5	1.806	A
		3	Entry	1	1	1	105	1051	0.100	105	104	0.1	0.1	3.905	A
						2	2, 3	238	1051	0.227	238	234	0.3	0.3	4.380
			Exit	2	1	(1, 2, 3)	344			344	338	0.0	0.0	0.060	A
2	1	Entry	1	1	2, 3	747	792	0.943	746	741	6.0	6.2	29.920	D	
				2	1, 4	14	792	0.018	15	14	0.0	0.0	5.066	A	
		Exit	2	1	(1, 2, 3, 4)	764			761	756	5.5	7.6	33.179	D	
		Exit	1	1		636			636	638	0.0	0.0	0.000	A	
	2	Entry	1	1	3, 4	128	943	0.136	127	127	0.2	0.2	4.507	A	
					2	1, 2	238	943	0.253	237	240	0.3	0.4	5.026	A
		Exit	2	1	(1, 2, 3, 4)	367			366	368	0.0	0.0	0.165	A	
		Exit	1	1		1610			1610	1607	0.0	0.1	0.127	A	
	3	Entry	1	1	1, 4	402	874	0.460	400	399	1.0	0.9	8.397	A	
					2	2, 3	719	874	0.823	719	726	3.0	3.1	15.126	C
		Exit	2	1	(1, 2, 3, 4)	1128			1121	1125	4.5	5.1	14.843	B	
	4	Entry	1	1	1, 2	216	680	0.318	217	213	0.4	0.3	5.767	A	
2					3, 4	61	680	0.089	61	62	0.1	0.1	5.602	A	
Exit		2	1	(1, 2, 3, 4)	275			277	276	0.3	0.2	2.740	A		
Exit		1	1		72			72	72	0.0	0.0	0.000	A		

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service	
1	1	Entry	1	1	2	1071	1536	0.697	1073	1114	2.7	1.7	6.200	A	
				2	1, 3	281	1536	0.183	280	288	0.4	0.3	3.037	A	
		Exit	2	1	(1, 2, 3)	1351			1352	1398	3.1	0.9	2.970	A	
	2	Entry	1	1	3	492	960	0.512	490	489	1.4	1.1	7.283	A	
					2	1, 2	219	960	0.228	218	218	0.5	0.3	4.910	A
			Exit	2	1	(1, 2, 3)	711			711	706	0.5	0.2	0.682	A
		3	Entry	1	1	1	88	1068	0.082	88	88	0.1	0.1	3.850	A
						2	2, 3	192	1068	0.179	192	193	0.3	0.2	4.238
			Exit	2	1	(1, 2, 3)	279			280	280	0.0	0.0	0.023	A
2	1	Entry	1	1	2, 3	627	852	0.737	631	659	6.2	2.6	19.440	C	
				2	1, 4	12	852	0.014	12	12	0.0	0.0	4.576	A	
		Exit	2	1	(1, 2, 3, 4)	628			639	657	7.6	0.5	13.932	B	
	2	Entry	1	1	3, 4	102	948	0.108	101	103	0.2	0.1	4.336	A	
					2	1, 2	201	948	0.212	201	201	0.4	0.3	4.838	A
			Exit	2	1	(1, 2, 3, 4)	304			303	304	0.0	0.0	0.082	A
		3	Entry	1	1	1, 4	326	888	0.367	327	331	0.9	0.5	7.044	A
						2	2, 3	598	888	0.674	599	614	3.1	1.8	11.529
			Exit	2	1	(1, 2, 3, 4)	921			924	938	5.1	0.4	4.025	A
	4	Entry	1	1	1, 2	180	763	0.236	180	178	0.3	0.3	5.039	A	
					2	3, 4	53	763	0.069	53	51	0.1	0.1	5.084	A
		Exit	1	1	(1, 2, 3, 4)	233			233	228	0.2	0.1	1.516	A	
1					1		61			61	61	0.0	0.0	0.000	A

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Average throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service	
1	1	Entry	1	1	2	884	1548	0.571	885	899	1.7	1.2	4.957	A	
				2	1, 3	227	1548	0.147	227	230	0.3	0.2	2.855	A	
		Exit	2	1	(1, 2, 3)	1112			1111	1126	0.9	0.3	0.782	A	
	2	Entry	1	1	3	414	978	0.423	413	408	1.1	0.7	6.418	A	
					2	1, 2	183	978	0.187	184	185	0.3	0.2	4.646	A
			Exit	2	1	(1, 2, 3)	597			597	590	0.2	0.0	0.289	A
		3	Entry	1	1	1	75	1080	0.069	74	75	0.1	0.1	3.686	A
						2	2, 3	162	1080	0.150	161	159	0.2	0.2	3.959
			Exit	2	1	(1, 2, 3)	237			236	234	0.0	0.0	0.017	A
2	1	Entry	1	1	2, 3	516	902	0.571	513	523	2.6	1.4	9.624	A	
				2	1, 4	10	902	0.011	10	9	0.0	0.0	4.547	A	
		Exit	2	1	(1, 2, 3, 4)	525			526	528	0.5	0.0	0.443	A	
			1	1		433			433	443	0.0	0.0	0.000	A	
	2	Entry	1	1	3, 4	90	955	0.095	90	87	0.1	0.1	4.151	A	
					2	1, 2	166	955	0.174	166	171	0.3	0.2	4.563	A
		Exit	2	1	(1, 2, 3, 4)	257			257	258	0.0	0.0	0.065	A	
			1	1		1109			1109	1120	0.0	0.0	0.000	A	
	3	Entry	1	1	1, 4	268	901	0.297	267	273	0.5	0.5	5.875	A	
					2	2, 3	498	901	0.552	498	501	1.8	1.4	8.956	A
		Exit	2	1	(1, 2, 3, 4)	765			765	772	0.4	0.2	0.798	A	
			1	1		144			144	141	0.0	0.0	0.000	A	
4	Entry	1	1	1, 2	151	832	0.181	151	148	0.3	0.2	4.745	A		
				2	3, 4	40	832	0.048	40	42	0.1	0.0	4.619	A	
	Exit	2	1	(1, 2, 3, 4)	191			191	189	0.1	0.1	0.995	A		
		1	1		48			48	50	0.0	0.0	0.000	A		

APPENDIX E WCHAR



**Proposed Employment Land
North East of J10 M42,
North Warwickshire**

Walking, Cycling & Horse-Riding Assessment

Report No. D000157 – WCHAR

4 Kempston Place
South Queensferry
Edinburgh,
EH30 9QW

Date: 6th October 2022



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- Appendix C – Collision Data
- Appendix D – Findings and Opportunities Location Plan

1 Scheme Description & Background

- 1.1 Drummond Black Consulting have been commissioned by Tetra Tech to undertake the Walking, Cycling and Horse-Riding Assessment for up to 100,000 sqm of proposed employment uses on land to the north east of M42 Junction 10.
- 1.2 The report is prepared in accordance with Design Manual for Roads and Bridges (DMRB) *GG142 Walking, Cycling and Horse-Riding Assessment and Review* (WCHAR). A brief was supplied with detailed information including NMU traffic count information and the scope of the project was discussed over online calls with both the design team and Warwickshire County Council (WCC). This has been assessed as a large scheme. National Highways (NH) were contacted, however no comments were received.
- 1.3 This report assesses the existing facilities for pedestrians, cyclists and equestrian users in the local area, provides background information on the users and identifies opportunities for improvements for the users. The findings and opportunities identified in this report are not solely intended for the developer to address, but to inform discussion with the relevant authorities to enable co-ordination with the development of external schemes to achieve the objectives. A number of these are outlined in the Warwickshire Local Cycling and Walking Infrastructure Plan described in Section 2 (Table 2.1) of this report.
- 1.4 A site visit was carried out by the lead assessor on Friday 27th May 2022 between 9am and 2pm where the full study area was examined. The weather was clear and sunny. Traffic flow was busy and a number of pedestrians and cyclists were observed.

Background

- 1.5 The proposed development is for up to 100,000 sqm of employment uses on land to the north east of M42 Junction 10. The proposals also include the removal of existing parking laybys at the A5 and replacing them with a new facility for up to 150 vehicles within the site. The final details of the internal layout, including access junctions and parking layouts, will be addressed at a later date so this assessment seeks to input into this creation of the design.
- 1.6 The proposed development would be served by a new signal controlled all-movements access junction at the A5. The proposed layout has been designed in accordance with published guidance from National Highways (formerly Highways England), acting as the Highway Authority responsible for the A5 carriageway.

- 1.7 The site is currently served by a reasonable level of infrastructure to accommodate predicted journeys by walking, cycling and public transport modes. The immediate surrounding area accommodates a substantial amount of employment development, with potentially up to 10,000 people working each day. The proposed development would deliver a range of improvements that should ensure substantial improvements in accessibility, particularly for walking and cycling journeys, that could benefit all users.
- 1.8 These improvements include upgrading the existing east and westbound bus stop facilities at the A5, provision of signal controlled crossing facilities within the access as an alternative to the current priority controlled crossing on the A5, upgrading of existing footpaths within the site and adjacent land to provide much improved pedestrian and cyclist links that avoid the M42 Junction 10 and A5 corridor, and finally the delivery of a continuous shared footway/cycleway link that extends throughout the scheme connecting the A5 to Birchmoor and a series of designated route options for pedestrians and cyclists. Access by public transport is also achievable through local bus routes and two rail stations at Polesworth and Wilnecote.
- 1.9 By providing these infrastructure improvements, the proposed development also offers substantially increased access to and from Local Plan development sites in the area (sites H4 Land east of Polesworth & Dordon, H5 Land to the west of Robey's Lane adjacent to Tamworth and Tamworth Golf Course Sustainable Urban Extension) that intend to deliver over 4,000 dwellings between them. Without the link through the site, residents at each location would likely be required to travel via the M42 Junction 10 and/or the A5 corridor, which could present a significant barrier to sustainable travel options.
- 1.10 This WCHAR assessment report is prepared as part of the preliminary design phase. The WCHAR review report will be prepared at the end of the preliminary design before construction commences.
- 1.11 The existing layout and facilities in the area are illustrated in Figure 1 and described below.
- 1.12 A footway extends along the southern edge of the A5 past the site, measuring approximately 1.8 metres wide. There is a section on the southern side between "The Cat Cottage" and the westbound layby that narrows to less than 1 metre as a result of poor maintenance. Along the northern edge of the carriageway, a 2 metres wide shared footway / cycleway exists, however, there are several points, particularly to the east, where width is constrained by street furniture and overgrown vegetation. The northern path was frequently used by pedestrians and cyclists, whilst the southern path was used less frequently. These connect to the M42/A5 roundabout

where all arms include dropped kerbs and tactile paving crossings, although crossings are uncontrolled. There are crossing facilities across the A5 to reach destinations to the south via either signalised crossings at Birch Coppice and Core 42 Business Park or via the overbridges further to the east at Dordon. The path link through to Browns Lane in Dordon is currently signed as “No Cycling”. The streets in Dordon are low speed and traffic calmed. There is scope for improvement along this route with basic improvements in maintenance of overgrown vegetation. To the east, this will provide a link from the site to Dordon and onward to Grendon.

- 1.13 The residential areas of Birchmoor and Polesworth are within the catchment area of the site and include Polesworth Sports Centre and School. It is currently possible to walk through the site on a bridleway to access Birchmoor and onward destinations to the northwest including good standard cycle routes into Tamworth. Additional onward connections are available via the Coventry Canal off the B5000.
- 1.14 As mentioned above, there are good facilities to connect to Tamworth to the northwest with an off road path network to the west of Green Lane in Birchmoor. Also to the west of the M42, utilising the footway at the southern edge of the roundabout and then the A5, pedestrians can access the Centurion Business Park and its units via Centurion Way (this includes a Premier Inn Hotel, restaurant/pub, and various employment units (offices and industrial)). The adjacent residential area further west via Watling Street is also within accessible distance. Furthermore, using the footway at the northern edge of the roundabout and then Green Lane (south), pedestrians can access the Relay Park (including various offices and industrial units) and Tamworth Services (this includes M&S Simply Food, Costa Coffee, Burger King and Esso).
- 1.15 To the south, while there is a footway only provide on the A5, this is used by cyclists and connects to facilities on Trinity Road that provide connections to the southeast of Tamworth and Hockley via Overwoods Road. While the path on the A5 is not signed as a shared facility, it is signed as such from the M42, south on Trinity Road. An alternative public footpath exists through the site of Tamworth Logistics Park (East).

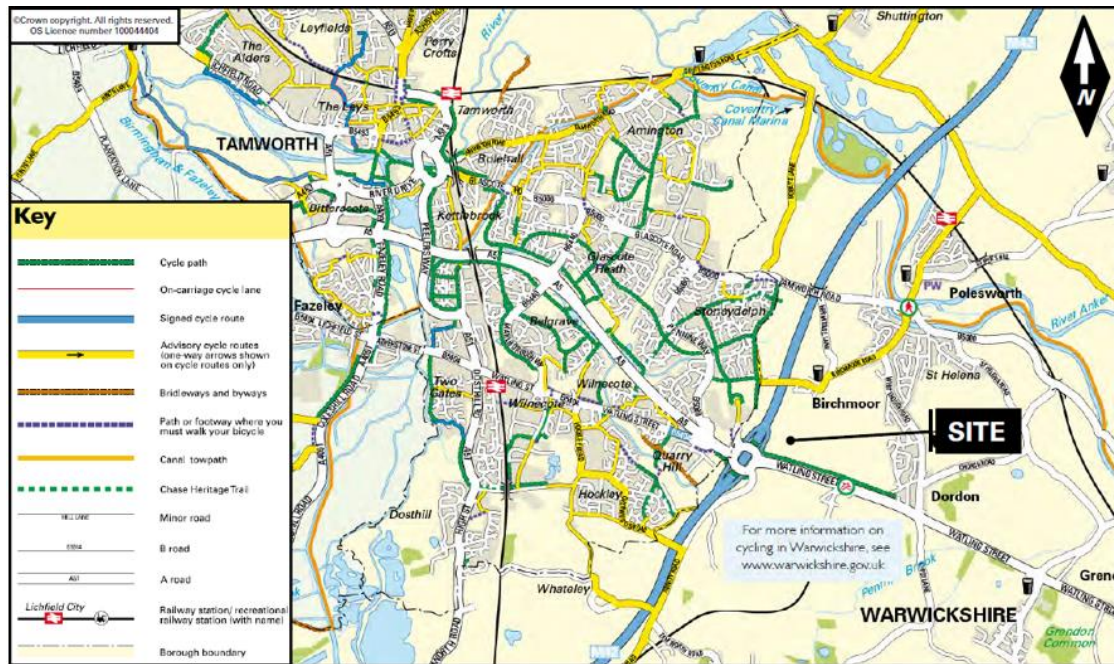


Figure 1 – Existing Cycle Facilities

1.16 Survey information for non-motorised users has been provided for the following locations:

- M42 J10 (Sept 2021 & June 2022)
- A5 Watling Street (Sept 2021 & June 2022)
- Green Lane (West) (June 2022)
- Green Lane/ Cockspur Street (June 2022)
- Path Interchange north of Tamworth Services (June 2022)

1.17 Initial survey data was provided from the Transport Assessment with additional targeted surveys carried out in June 2022. The summary below is from the most recent data.

1.18 On the A5 path passing the site, there were 11 pedestrians (2-way) over 12 hours on the north side and 13 on the south side. During this period there were 38 cyclists on the north side and 51 cyclists on the south side. The Green Lane route through Birchmoor over the M42 was a popular route for pedestrians and cycles as there was 290 (2-way) pedestrians over 12 hours and 71 cyclists.

1.19 On M42 J10, there were 11 pedestrians & 38 cyclists around the north side (Same as A5 passing site above) with 10 pedestrians/ 54 cyclists around the south.

1.20 Pedestrian flows would be considered generally low at all count locations. Full count data is included in Appendix B.

1.21 Information provided by the British Horse Society shows that there are 584 horse registrations in the B78 postcode area, although no horse riding was noted during the site visit or is present in the areas surveyed. Bridleway AE45/1 runs along the eastern site boundary in a north / south direction.

Proposed Access Arrangements

1.22 The proposed internal pedestrian and cycle connections and their links to the external network are shown on the initial site layout drawing in Appendix A.

1.23 Active travel proposals are to include the following:

- 3 metres wide dual use footway/cycleway to either side of the site road and access junction;
- 3 metres wide dual use footpath / cycle path linking north from the site road to Birchmoor;
- 3 metres wide footpath / cycleway linking east from the site road to the nexus of Public Bridleway AE45 and Public Footpath AE46 (Shown on Figure 23 in the Transport Assessment);
- A network and new and improved Public Footpaths, footpaths and cycleways crossing the broader area to promote sustainable modes of travel/commuting and local community health and fitness, particularly enhancing east-west routes. This will include tarmac footpaths and cycleways and appropriate surfaces for bridleways, all of which would be compliant with the Equalities Act 2010 providing “access for all”;
- New off line cycleway connecting east from M42 J10 to Dordon;
- An on-site bus stop for A5 east & westbound buses supported by Stagecoach and WCC;
- New enhanced fully signal controlled pedestrian crossing for the A5, compared to the existing junction staggered pedestrian crossing that passes through the central reserve;
- Cycle parking provided to all units at in excess of the North Warwickshire standards; incorporating a range of parking facilities to include indoor/outdoor parking, secure parking and covered parking, all located at or close to pedestrian entrances;
- Showers and changing facilities provided to all units;
- Communal cycle parking, showers and changing facilities for site occupiers located at the ancillary Hub Office; and
- Site wide Travel Plan to be applicable to all future occupiers.

- 1.24 For vehicular access, the development would be served by a single signal-controlled access junction at the northern edge of the A5 carriageway. The proposed site access layout is shown in Drawing Number F19123/07 in Appendix A. The proposed layout has been prepared in accordance with the requirements of CD123 'Geometric design of at-grade priority and signal-controlled junctions'.
- 1.25 In addition to the site access, off site improvements are also proposed, including:
- Signal controlled crossings within the proposed site access helping to reduce usage of the existing priority-controlled facility nearby;
 - Provision of an internal pedestrian and cycle link connecting the A5 to Birchmoor, thus offering a higher quality route for pedestrians and cyclists travelling between the A5 and areas to the north and west (particularly within Tamworth);
 - Reduction in overall vehicle speeds due to the proximity of an additional signal controlled junction, thereby improving the overall environment for pedestrians and cyclists using the A5 corridor;
 - The proposed scheme will increase the separation between pedestrians/cyclists and A5 to standard verge; and
 - Removal of existing parking laybys that do not meet current design requirements, in favour of a high-quality lorry parking facility for up to 150 vehicles, to include supporting facilities for drivers.

Scheme Objectives

- 1.26 No specific objectives have been specified as part of the brief for this assessment, however it is stated that one of the aims of the proposals is to ensure the proposed development is accessible by all modes of transport.

Study Area

1.27 The extent of the study area considered within this WCHAR assessment report has been established by the Lead Assessor following consultation with the cycling officer at WCC, illustrated in Figure 2. The Transport Assessment predicts that 80% of traffic will come from the west from the M42, however non-motorised user traffic would be expected to be more evenly spread from the residential areas surrounding the site. The assessment area broadly comprises of connections to the following:

- Dordon;
- Grendon;
- Polesworth;
- Wilnecote; and
- Tamworth.



Figure 2 – Study Area

2 Walking, Cycling & Horse-Riding Assessment

2.1 This chapter summarises the findings of the assessment as set out in Section 4 of GG 142. The findings under each topic area are summarised under each heading and any potential opportunities for improvements are identified in Chapter 3 of this report.

Assessment of Walking, Cycling & Horse-Riding Policies and Strategies

2.2 To prepare this WCHAR assessment report, the following local and national policy/advice notes have been considered. A policy review was carried out as part of the Transport Assessment and the relevant information from this has been extracted and summarised below. In addition to this, following discussions with the relevant local authorities, additional policy and strategic documents, including the Warwickshire Local Cycling and Walking Infrastructure Plan were provided for review that include potential schemes.

National Planning Policy Framework (NPPF)

2.3 The NPPF is the overarching Government guidance on planning with the latest version released in July 2021. In respect of planning obligations, Paragraph 57 states how contributions must only be sought where they meet all the following tests:

- “a) necessary to make the development acceptable in planning terms;*
- b) directly related to the development; and*
- c) fairly and reasonably related in scale and kind to the development.”*

2.4 The NPPF places heavy emphasis on the importance of sustainability, where Paragraph 105 sets out that:

‘The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making’.

2.5 Paragraph 110 goes on to set out key criteria that development sites should establish. It states:

“In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;

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

c) the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code;

and

d) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.”

2.6 Paragraph 112 of the NPPF goes on to set out a list of preferred criteria for applications for development. It recommends that priority is given to pedestrian and cycle movements and minimising the scope for conflict with vehicles.

DfT Circular 02/2013: The Strategic Road Network and the delivery of sustainable development (10 September 2013)

2.7 In addressing the assessment of development impact, Paragraph 26 advises how the “Highways Agency expects the promoters of development to put forward initiatives that manage down the traffic impact of proposals to support the promotion of sustainable transport and the development of accessible sites. This is particularly necessary where the potential impact is on sections of the strategic road network that could experience capacity problems in the short or medium term”.

North Warwickshire Borough Council Local Plan (Adopted September 2021)

2.8 Chapter 5 of the North Warwickshire Borough Council Local Plan (NWBCLP) sets out the following objectives for the Local Plan:

1. To secure a sustainable pattern of development reflecting the rural character of the Borough
2. To provide for the housing needs of the Borough
3. To develop and grow the local economy for the benefit of local residents
4. To maintain and improve the vitality of the Market Towns
5. To promote rural diversification
6. To deliver high quality developments based on sustainable and inclusive designs
7. To protect and enhance the quality of the natural environment and conserve and enhance the historic environment across the Borough

- 8. To establish and maintain a network of accessible good quality Green Infrastructure, open spaces, sports and recreational facilities
- 9. To ensure the satisfactory provision of social and cultural facilities

2.9 The document also notes Walking and Cycling (LP27) on the development of a walking and cycling strategy - “All developments should consider what improvements can be made to encourage safe and fully accessible walking and cycling”.

2.10 The plan identifies two major housing sites in the area (sites H4 Land east of Polesworth & Dordon and H5 Land to the west of Robey’s Lane adjacent to Tamworth) that intend to deliver almost 3,000 homes that will be within the cycling catchment of this site, as well as several smaller housing sites.

Warwickshire Local Cycling and Walking Infrastructure Plan (LCWIP)

2.11 The Warwickshire LCWIP contains a number of proposed cycle schemes (NW10) to the east of the site in Polesworth and Dordon including:

Table 2.1 – Proposed cycle schemes in Polesworth and Dordon

Ref	Potential Schemes	Type
P01	Alvecote development	New footway/ cycle track adjacent to road
P02	Polesworth and Dordon north-south links	On-carriageway cycle route
P03	Bridleway and Green Lane (A5 Birch Coppice - Birchmoor - Stonydelph)	Cycle track/ path on open space and on-carriageway route
P04	Polesworth developments	New footway/ cycle track adjacent to road and cycle track/path
P05	St Helena Road/ Dordon Hall Lane (Polesworth - Grendon)	On-carriageway cycle route
P06	Church Road/ Dunns Lane, Dordon	On-carriageway cycle route
P07	Path (A5 Birch Coppice junction - Browns Lane)	Cycle track/ path on open space
P08	A5 Watling Street (M42 Junction 10)	Widened/ upgraded footway adjacent to road and crossing
P09	Path (A5 Watling Street - Tamworth Logistics Park)	Cycle track/ path on open space
P10	A5 Watling Street (Birch Coppice - Dordon - Grendon)	Widened/ upgraded footway adjacent to road and on-carriageway cycle route
P11	A5 Watling Street (Grendon to Holly Lane)	Widened/ upgraded footway adjacent to road

DMRB – CD 143 Designing for Walking, Cycling and Horse-Riding

- CD 143 should be used for the design of walking, cycling and horse-riding routes on and/or adjacent to the motorway and all-purpose trunk road network.
- Walking, cycling and horse-riding routes shall be free from unnecessary diversions, frequent obstacles and fragmented facilities
- The core design principles for walking, cycling and horse-riding are:
 - Coherence: Link trip origins and destinations, including public transport access points. Routes are continuous and easy to navigate.
 - Directness: Serve all the main destinations and seek to offer an advantage in terms of distance and journey time.
 - Comfort: Infrastructure meets design standards and caters for all types of user, including children and disabled persons.
 - Attractiveness: Aesthetics, noise reduction and integration with surrounding areas are important.
 - Safety: Dedicated networks and facilities not only improve pedestrian, cyclist and equestrian safety, but also their feeling of how safe the environment is. This includes access to adjacent areas, sightlines, fencing, lighting, landscaping and surveillance. It also includes avoiding opportunities for assailants to conceal themselves.

Collision Data

2.12 A collision review was carried out as part of the Transport Assessment covering the M42 Junction, Dordon Roundabout, Long Street and Gypsy Lane. The study period covered the five years to 2020.

2.13 A total of 50 collisions were recorded during the study period, where none were classified as 'fatal', 10 were classified as 'serious', and the remaining 40 collisions all classified as 'slight'. Throughout the study area a total of 6 collisions involved cyclists, two involved pedestrians, and the remaining 42 incidents involved vehicles only. The collisions can be broken down by the following years:

- 2016 - 13 collisions (26%)
- 2017 - 12 collisions (24%)
- 2018 - 9 collisions (18%)

- 2019 - 9 collisions (18%)
- 2020 - 7 collisions (14%)

2.14 Full details of the assessment are included in the Transport Assessment.

2.15 For this assessment WCC have provided collision data for the same time period for the whole area isolating collisions involving pedestrians and cyclists. This plan is included in Appendix C. Specific collisions from this are detailed in Table 2.2 below.

Table 2.2 – Specific Pedestrian and Cycle Collisions

Ref/ Mode	Day/Date	Time	Road Surface/ Weather	Severity	Description
831674 Cycle	06.02.19	1750	Dry	Slight	Vehicle 2 (pedal cycle), travelling on A5 towards Junction 10 M42S, has been struck before the slip road by vehicle 1 (goods<3.5t)
815904 Cycle	06.02.19	1800	Wet/Fine	Slight	Vehicle 2 (pedal cycle) was cycling round the roundabout when vehicle 1 (goods vehicle) cut him up.
151799 Cycle	10.01.17	0625	Wet/Fine	Serious	Vehicle 2 (pedal cycle) entering the island on junction 10, M42S was cut up by vehicle 1 (goods >7.5t) moving from the inside lane to the middle lane causing a collision and the rider to come off his bike.
274607 Cycle	01.03.18	0549	Frost/ Fog	Slight	Vehicle 2 (pedal cycle) has crossed the road in front of vehicle 1 (car) who was travelling along the A5 through a green light, causing them to collide.
929343 Pedestrian	06.02.20	1730	Dry/ Fine	Serious	Casualty 1 ran out into the carriageway of Watling Street (A5) and was hit by vehicle 1 (car) travelling at low speed in slow moving traffic.
979503 Pedestrian	31.07.20	1644	Dry/ fine	Serious	Pedestrian walking across A5 while looking down at their mobile phone was hit by vehicle 1 (motorcycle).
345459 Cycle	22.10.18	1448	Dry/ Fine	Slight	Vehicle 1 (car) turned right at island into Roman Way when vehicle 2 (bicycle), who at own admittance was on his phone, cycled into path of vehicle 1 and was hit on the back wheel.
181855 Cycle	11.05.17	1027	Dry/ Fine	Slight	Vehicle 1 (goods vehicle)travelling up Long Street and turning right into Church Road collided with vehicle 2 (bicycle) travelling down Long Street going past junction of Church Road.

2.16 The above collision summary and the analysis carried out as part of the Transport Assessment shows three cycle collisions at J10 of the M42. Two slight injury collisions to the south and a serious collision to the north. Two cycle collisions were recorded on Long Street and 1 on the A5

at Danny Morson Way. Two serious pedestrian collisions occurred on the A5 between Danny Morson Way and Long Street.

Public Transport Services and Interchange Information

- 2.17 Following a review of the existing public transport services available within the study area, the following bus services are accessible from the site.
- 2.18 The site is served by bus routes at the A5 and then at Birchmoor Road, which are each within 400 metres of the site boundary, providing access to a number of locations such as Atherstone, Grendon, Dordon, Polesworth, Amington, Austrey and Tamworth. Routes 766, 767, 785 and 786 operate a combined frequency of one service every hour in each direction, Monday to Saturday, with one bus every 2 hours on Sundays.
- 2.19 The closest bus stop is located at the northern edge of the A5, approximately 150 metres to the east of the existing access. This comprises a bus pull in layby with no flag and pole arrangement serving eastbound services for Routes 766 and 767. To access westbound services, the closest bus stop is located within the Birch Coppice Business Park, approximately 870 metres to the southeast of the existing site access. Further bus stops are located on Birchmoor Road, approximately 350 metres north of the site which comprise a flag and pole type arrangement for services in both direction for Routes 785 and 786. These services can be accessed from the north of the site via Cockspur Street and the existing bridleway.
- 2.20 The bus timings for each route indicates that an employee living in Polesworth (or arriving by train) could catch a bus at 0802 hours and arrive at the Birchmoor Road stop for around 0816 hours, meaning a journey time of circa 15 minutes that could connect with the conventional 0900 hours start time. Similarly, employees heading to Tamworth, either to home or the Train Station, could catch a bus at 1750 hours, which should then arrive at Tamworth Rail Station for around 1827. The current journey times provided by each of the route options are such that future employees at the site should be able to travel to work from each of the key local areas set out above.

Table 2.3 – Bus Routes

Service	Route Description
766/767 (Stagecoach)	Atherstone - Grendon - Dordon – Tamworth Tamworth - Dordon - Grendon - Atherstone
785/ 786 Stagecoach	Tamworth - Amington - Polesworth - Dordon - Amington - Tamworth
785/786 (Arriva)	Tamworth - Amington - Polesworth - Dordon - Amington - Tamworth

2.21 The site is served locally by three train stations at Polesworth, Wilnecote, and Tamworth, which each operate separate lines to different destinations. Polesworth Station is located approximately 2.8 kilometres to the north and accommodates the London Northwestern and Avanti West Coast lines, which serve Lichfield Trent Valley, Tamworth, Nuneaton, Stoke on Trent and Rugby. However, there appear to be accessibility issues at this station and severely restricted services are currently being run through this point. Access to Birmingham can be achieved via connections at Tamworth and the Cross Country line. Tamworth Station is approximately 7 kilometres northwest of the proposed site access, whilst Wilnecote Train Station is approximately 5 kilometres to the west.

2.22 Tamworth and Wilnecote Train Stations should be within a comfortable cycle ride or drop off as part of a shared journey. Each station operates regular services to key surrounding towns that could fit with conventional working times for employees at the site or visitors.

Key Trip Generators and Local Amenities

2.23 Within the extents of the study area under consideration, there are a number of key trip generators and local amenities, which have been identified during the preparation of this walking, cycling and horse-riding assessment. As this is an employment site, the main trips will originate from residential areas. This mainly covers Tamworth to the west and Polesworth to the north with many smaller residential areas to the south and east, including Dordon, Grendon and Hockley. This assessment will focus on connectivity to these main areas.

2.24 The proposed site layout includes access for non-motorised users to the north and east of the site as well as from the main access on the A5 with dedicated connecting facilities alongside the spine road. The existing bridleway will be diverted along the eastern boundary of the site.

Site Visit

2.25 A site visit was carried out on 27th May 2022 where the full study area was visited either on foot or by cycle to assess the connections from these access points to the local residential areas. The findings from the site visit are summarised below.

2.26 The findings are separated into the various route connections from the proposed development site based on the direction from the site, including:

- Connections to Tamworth (North & West);
- Connections to Polesworth (North and East);
- Connections Dordon & Grendon (East);
- Connections to Hockley & Wood End (South & West); and
- General Area Wide Findings;

2.27 ***Section 1 (Tamworth)***

2.28 User travelling to and from Tamworth from the site will have the option of travelling to the north to Birchmoor and across the M42 overbridge to Green Lane, and then via an existing network of paths to reach their onward destinations. Alternatively, from the south of the site, users will pass through the main access, then head west on the A5 via a shared footway cycleway and across M42 J10 gyratory.

2.29 Finding 1: Green Lane Connection

Users travelling to Tamworth from the north of the site via Birchmoor would use/ exit via Cockspur Street and then cross the M42 on the Green Lane overbridge. While this is a relatively low traffic route, there are a number of obstacles to active travel. Pavement parking is an issue on Cockspur Street and parked vehicles on the north side of Green Lane enforce a one-way priority system that could be discouraging for cyclists using the carriageway. The footpath on the south side of green lane is relatively wide and could have potential for improvement.



Figure 3 – Green Lane Connection

2.30 Finding 2: A5 Path width and maintenance (South)

All along the A5 in the vicinity of the site and around the M42 junction, vegetation is poorly maintained and reduces the effective width of the footpaths and shared footway/ cycleways. With the proposed development and an expected increase in walking and cycling trips, this could discourage these trips and also create a number of hazards.



Figure 4 – A5 Paths (Southern side)

2.31 Finding 3: M42 J10 uncontrolled crossings

While the M42 junction is signalised, the pedestrian crossings are not included in the signal staging and operate as uncontrolled crossings. While users are able to judge crossing on the traffic signals when red, vulnerable users would be discouraged from using this as a route. A particular area where all users would have difficulty would be at the northbound off-slip where they are required to cross 5 lanes on an uncontrolled crossing.



Figure 5 – Uncontrolled crossings

2.32 Finding 4: Missing link to Centurion Park

Cyclists traveling from the site to the west towards Centurion Park reach a point on the A5 to the west of the M42 where the cycle facility ends on the diverge for Pennine Way/ Quarry Hill roundabout. Here they are instructed to dismount (or ride on the carriageway). The facility to the east is currently footway only but could potentially be upgraded.



Figure 6 – A5 Missing link

2.33 Finding 5: Link through Tamworth Services

If users were to choose to travel west around the north side of the M42 junction, there is a gap in provision of suitable connecting facilities on Green Lane – Relay Drive to link them to the path network to the north. The paths are footway only and do not offer a suitable facility for cyclists. The paths are also currently overgrown with reduced width. The path network access is to the north of Relay Drive with an additional access leading up to Green Lane to the east of the services. It appears as if there would be potential to provide improved links to the path network for onward journeys.



Figure 7 – Relay Drive/ Tamworth Services

2.34 **Section 2 (Polesworth)**

2.35 Polesworth is a residential area to the north east of the site with a number of schools and a rail station. It is likely that residents in the area would walk or cycle to the site either via Birchmoor Road and Cockspur Street. With the train station to the north and the Coventry Canal, there is potential for onward cycle trips.

2.36 Finding 6: Birchmoor Road (inc. Bus Stops)

While Birchmoor Road has a footway on the south side and lighting, the road is rural in nature and straight which could encourage high speeds. If this link was to be used as a connection for cycles to and from the site, it could benefit from some form of traffic calming.



Figure 8 – Birchmoor Road

2.37 **Section 3 (Dordon & Grendon)**

2.38 To the east of the site are the residential areas of Dordon and Grendon. The main routes to these areas will be via existing provision on the A5, although there is potential for quieter routes through the site to Dordon. The industrial areas at Birch Coppice are also accessible to the south of the A5.

2.39 Finding 7: Tie-in at Barn Close

There is potential to connect into the west of Dordon at Barn Close, where users could avoid the A5 with a quieter more direct route from the site.



Figure 9 – Barn Close (Image from Google)

2.40 Finding 8: Browns Lane Link

There is an existing link from the A5 to the west side of Dordon at Browns Lane, however this is currently signed with “No Cycling” signs. It is expected that this is as result of a narrow pinch point at the eastern end of the lane. There is potential for this link to be upgraded to include cyclists.



Figure 10 – Browns Lane Link

2.41 Finding 9: Pinch Point at Birch Coppice junction

At the traffic signals for the Birch Coppice junction to the east the path narrows considerably and could result in conflicts between pedestrians and cyclists.



Figure 9 – Pinch Point

2.42 Finding 10: A5 East of Quarry Close

For travel further east to Grendon, there is a gap in cycle provision ends (Quarry Close) and only footway provision continues further east. There is potential to improve this and provide for cycles further east. Where there are constraints, localised signing could be used to warn of any hazards.



Figure 10 – End of Cycle Facility

2.43 **Section 4 (Hockley & Wood End)**

2.44 The main trip attractor to the southwest is the residential area at Hockley with onward destinations to the south of Tamworth. There is a good facility for cycles and pedestrians on Trinity Road and there are paths connecting through Tamworth Logistics Park.

2.45 Finding 11: Missing Link – Trinity Road (North)

While there is a cycle facility on Trinity Road, this does not extend all the way to the M42 junction. The section between the logistics park and the M42 is footway only and is also narrow and overgrown. There are alternative footpath links through the logistics park, although these are not signed and cyclists are prohibited.



Figure 11 – End of Cycle Facility

2.46 Finding 12: Overwoods Road

When cyclists leave the Trinity Road facility and continue west on Overwoods Road, they would be required to ride on road. The road is straight and rural in nature and with potential high vehicle speeds could be discouraging.



Figure 12 – Overwoods Road

2.47 **Section 5 (General Area Findings)**

2.48 While the area generally has good provision of facilities for non-motorised users, there are a number of issues common across the area that could serve to discourage walking and cycling as a mode choice.

2.49 Finding 13: Maintenance

Area wide, vegetation in particular was overgrown reducing effective widths of path and making access difficult for certain user groups. With adequate maintenance, much of the paths could be significantly widened.



Figure 13 – Maintenance Issues

2.50 Finding 14: Pavement Parking

As also mentioned for the area to the north of the site, general observations throughout the area note that pavement parking is common practice and can be a barrier to walking, especially for those with visual and mobility impairments.



Figure 14 – Pavement Parking

2.51 Finding 15: Lack of tactile paving provision

While tactile paving is provided at some crossing points, particularly on the A5 and M42, there were many crossings noted throughout the area with no formal provision to assist visually impaired users.



Figure 15 – Absence of tactile paving

Consultation with Key Stakeholders

- 2.52 As the proposals are at a very preliminary stage, it is expected that consultation at this stage would offer little benefit to this assessment. Following discussion with WCC it was agreed that consultation as part of this WCHAR would concentrate on a few key stakeholder groups, including:
- National Highways
 - Staffordshire Cycling Officers
 - Warwickshire Cycling Officer
 - Warwickshire Rights of Way Officer
 - Dordon Parish Council
 - Local Cycle Forum/ Tamworth Cycle Club
 - British Horse Society
- 2.53 Contact was made with the above, although comments and responses were not received from all groups. Where relevant comments were made, these have been included in the report. If further comments are received after the submission of this report, the report will be updated accordingly.
- 2.54 Further consultation will be carried out as the scheme proposals develop. This may be carried out as part of a wider consultation on the full proposals as part of the planning process and incorporated in a later review of this assessment.



3 User Opportunities

3.1 The opportunities highlighted below are considered to be relevant to the introduction of a highway improvement scheme and should be considered by the wider design team throughout the progression of the scheme design in addition to any further opportunities that may arise through the ongoing development of the design phase(s). A number of the opportunities identified would not be within full control of the developer and should be discussed further with the relevant roads authorities.

General

3.2 Opportunity 1: Maintenance of existing paths.

With many of the main road paths overgrown with vegetation, the effective width of the paths is significantly reduced. By cutting back the vegetation on these paths and ensuring they are regularly maintained and swept, this can open up more useable and attractive routes for users at a relatively low cost. Where new facilities are created as part of this development, landscaping should be used that requires minimal maintenance. It is understood that much of the maintenance is out-with the control of the developer. Off site maintenance should be discussed with the relevant highway authorities and a maintenance plan put in place.

3.3 Opportunity 2: Parking Restrictions and Enforcement

While it is understood that national government is looking into options for eradicating pavement parking, in the short term, legislation is not expected to be put in place. As noted from the site visit, there is a common issue of parking on pavements in the local area. This can restrict access to some users, particularly those with visual and mobility impairments. As part of the development proposals there are opportunities to provide measure on key routes to reduce pavement parking and ensure unobstructed footways and cycleways. The areas that require specific attention in relation to the development are the connections through Birchmoor and Polesworth and Dordon.

3.4 Opportunity 3: Route signing

It would not be considered feasible for the developer to improve all facilities in the neighbouring areas to ensure accessibility to the site. If a route signing strategy was developed, this would allow the improvements to be focused on main routes. It is recommended that signing of the key routes identified in Section 2 is provided.

3.5 Opportunity 4: Signalising M42 Ped Phases

The current uncontrolled crossings on M42 J10 are a deterrent for these routes being used by non-motorised users. There is an opportunity to provide signalised crossing facilities throughout this junction.

Strategic Opportunities

3.6 Opportunity 5: Green Lane

The proposals outlined in the Transport Assessment include the provision of a 3m wide shared path to connect to Birchmoor. The current provision on Green Lane and over the M42 only has footway provision and requires cyclists to ride on the road. With the parked vehicles this could be discouraging for cyclists, particularly when faced with oncoming traffic. The footway on the south side is relatively wide and may have potential to be upgraded to a shared cycle facility. Alternatively, signing and on road markings could provide a safer facility for cyclists to reach the path network to the west over the M42.

3.7 Opportunity 6: Tamworth Services link

As well as Green Lane, mentioned above, an alternative route to the west for Tamworth would be for users to use the A5 and M42 junction, however there is a gap in provision between the M42 junction and the start of the path network to the north and west of Tamworth Services. There is an opportunity to provide a formal signed route to connect the M42 junction to the path network.

Pedestrian Specific Opportunities

3.8 Opportunity 7: Links to Dordon and Polesworth

Proposals for links to Dordon and Polesworth are mentioned both in the Transport Assessment and as part of LCWIP. There is an opportunity to provide good standard surfaced and lit paths to connect through to Dordon and Polesworth that can be used all year round.

Cycling Specific Opportunities

3.9 Opportunity 8: Trinity Road

With the gap in cycleway provision to the southeast of M42 J10, cyclists choosing this route would be required to cycle on road in an unfriendly environment with heavy traffic. There is an opportunity to upgrade this path to allow shared pedestrian / cycle use.

3.10 Opportunity 9: Overwoods Road

Cyclists travelling to the southwest would be required to ride on the road on Overwoods Road in a potentially hazardous environment. There is an opportunity to improve provision on this section either with road narrowing/ traffic calming and a shared facility.

3.11 Opportunity 10: Birchmoor Road

Cyclists travelling to the north and east could choose to go through Birchmoor and along Birchmoor Road. On this section, cyclists would be required to ride on the road in a potentially hazardous environment. There is an opportunity to improve provision on this section either with road narrowing/ traffic calming and a shared facility.

3.12 Opportunity 11: Signing of route to Canal and Train Station

Linked to opportunity 10, providing a signed route to the key destinations of the train station and the canal could allow focused route improvements either on Birchmoor Road (above) or on a route through Polesworth.

3.13 Opportunity 12: Browns Lane Link

The current provision on this link prevents use by cycles, either requiring them to dismount and walk through or ride on a longer route. There is an opportunity with maintenance and minor widening to upgrade this link to allow use by cyclists.

3.14 Opportunity 13: A5 Cycle provision

A number of gaps in cycle provision on the A5 have been identified where the shared facilities end and continue as footways. This included the links to Grendon to the east, Centurion Park to the west and potential areas of conflict, such as on the north side of the Birch Coppice access junction. Southern sections of the A5 are also for pedestrian use only. These areas have been

identified as potential improvements in the LCWIP document for upgrade to cycle standard facilities.

Equestrian Specific Opportunities

- 3.15 Opportunity 14: Bridleway Diversion – It is understood that the current bridleway that is being diverted is currently considered a cul-de-sac route by the BHS with the A5 acting as a barrier to onward travel. With the introduction of the signalised crossing facilities this BHS felt that it could open up further routes and connections to the south and suggested that the opportunity may exist at this stage is to ensure that the crossing facilities being provided as part of the access junction could be of a standard that would allow a future upgrade for equestrians. From an examination of the available routes it was thought that possibilities for future extension of equestrian routes south of the A5 would be very unlikely and to allow for future upgrading now at the developer's expense would not be reasonable.

4 Walking, Cycling & Horse-Riding Assessment Team Statement

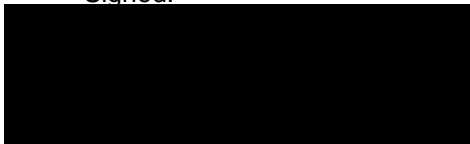
As Lead Assessor, I confirm that this Walking, Cycling & Horse-Riding Assessment Report has been compiled in accordance with DMRB GG 142 and thus contains the appropriate information for the wider design team. The Walking, Cycling & Horse-Riding Assessment was undertaken by the following Assessment and Review Team:

Walking, Cycling & Horse-Riding Lead Assessor

Richard Pearson BSc (Hons) CMILT MCIHT MSoRSA

Director, Drummond Black Consulting Ltd.

Signed:



Date: 6th October 2022

Drummond Black Consulting Ltd
4 Kempston Place
South Queensferry
EH30 9QW

Tel: +44(0) 7866 851654

As design team leader I confirm that the assessment has been undertaken at the appropriate stage of scheme development and that the wider design team has been involved in the process.

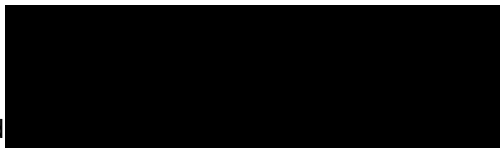
I confirm that in my professional opinion the appointed Lead Assessor has the appropriate experience for the role making reference to the expected competencies contained in GG 142.

Design Team Leader

Nick Bunn

Tetra Tech

Signed



Date: 6th October 2022

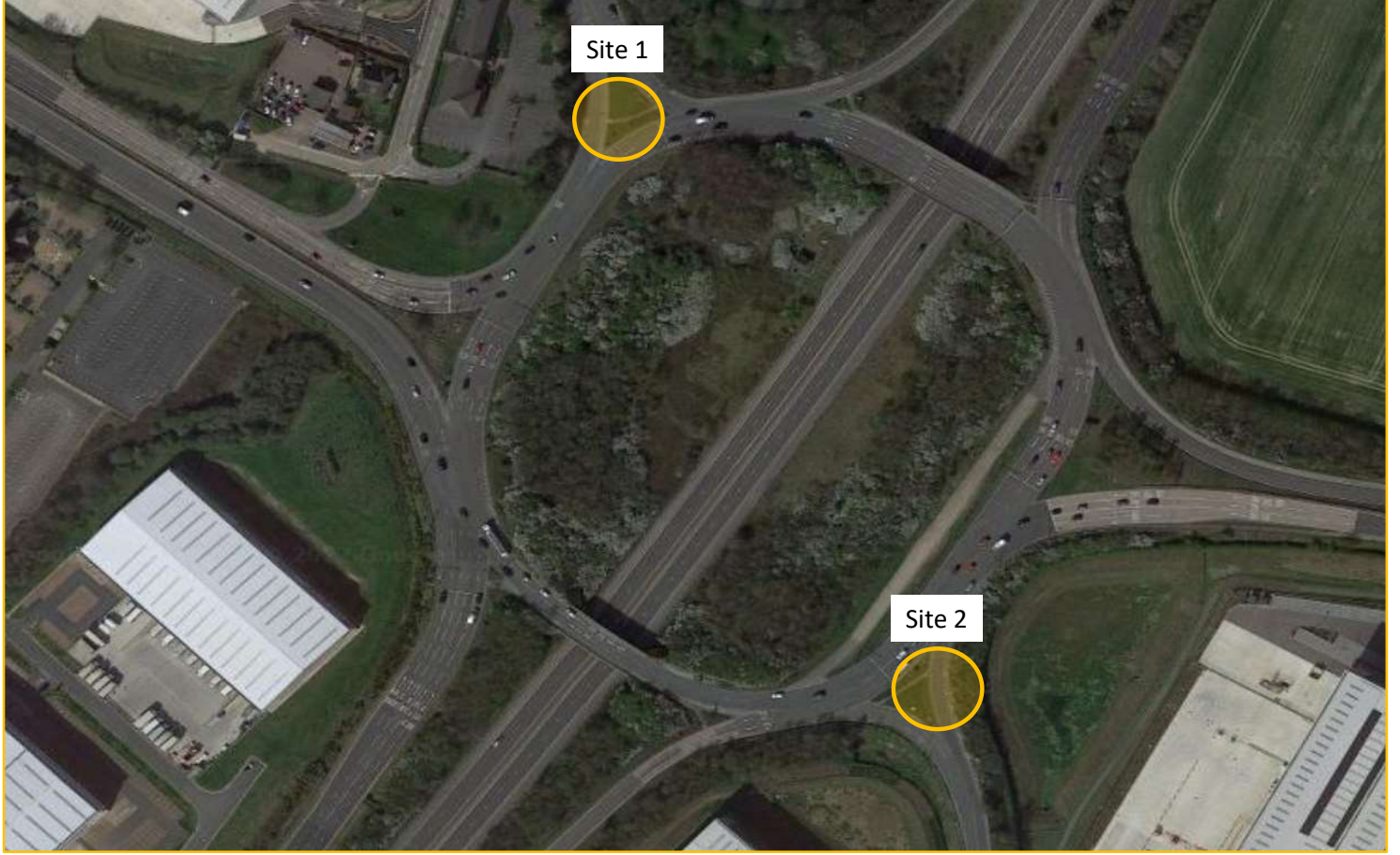


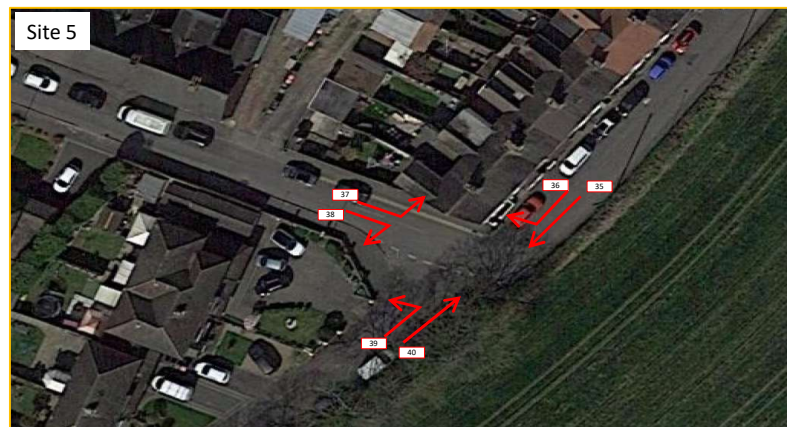
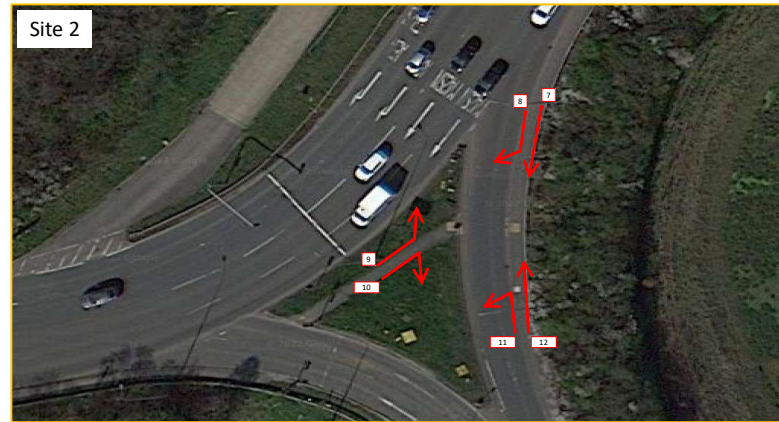
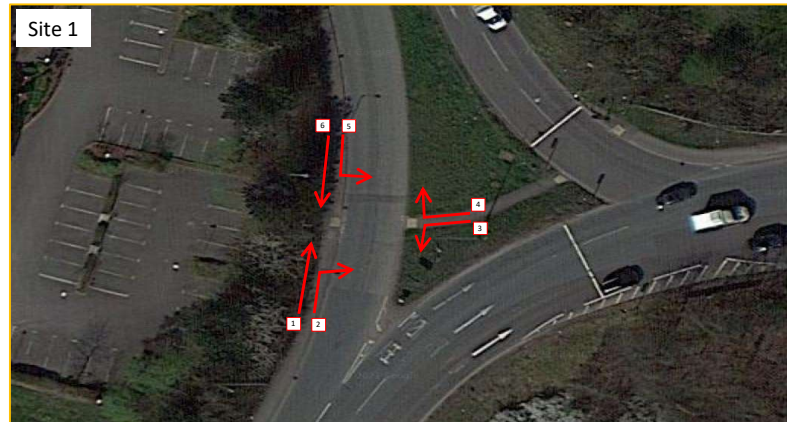
Appendix A – Preliminary Design Layouts





Appendix B – NMU Count Data





Site 2 - M42 Junction 10 South - 07:00-19:00 - 15 Minute Intervals

Table with 12 columns for Movements 7-12 and rows for 15-minute intervals from 07:00-07:15 to 18:45-19:00. Each movement column contains sub-columns for pedestrian, cycle, e-scooter, and mobility scooter counts, plus a total column.

Site 4 - Footpaths & Green Lane - 07:00-19:00 - 15 Minute Intervals

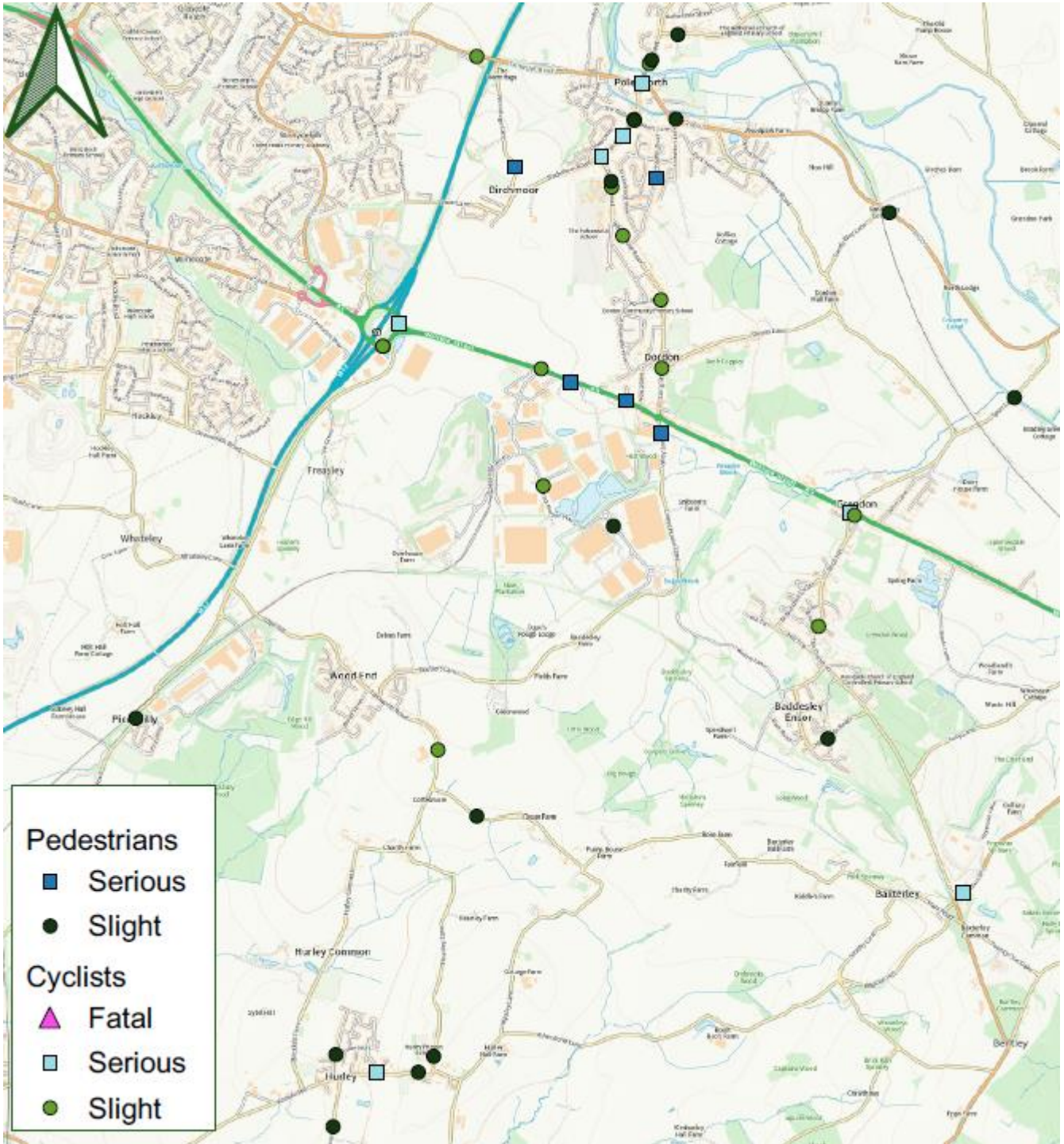
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	PEDESTRIAN	PCYCLE	E-SCOOTER	MOBILITY SCOOTER	PEDESTRIAN & BUGGY	EQUESTRIAN	TOTAL	PEDESTRIAN	PCYCLE	E-SCOOTER	MOBILITY SCOOTER	PEDESTRIAN & BUGGY	EQUESTRIAN	TOTAL	PEDESTRIAN	PCYCLE	E-SCOOTER	MOBILITY SCOOTER	PEDESTRIAN & BUGGY	EQUESTRIAN	TOTAL	PEDESTRIAN	PCYCLE	E-SCOOTER	MOBILITY SCOOTER	PEDESTRIAN & BUGGY	EQUESTRIAN	TOTAL
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0715-0730	1	0	0	0	0	0	1	3	0	0	0	0	0	3	1	0	0	0	0	0	0	1	5	0	0	0	0	5
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0800-0815	0	0	0	0	0	0	0	1	0	0	0	0	0	1	9	3	0	0	0	0	0	12	2	1	0	0	3	
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0845-0900	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2	1	0	0	3	
0900-0915	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2	2	0	0	0	0	0	4	3	1	0	0	4	
0915-0930	5	0	0	0	0	0	5	2	0	0	0	0	0	2	8	1	0	0	0	0	0	9	4	0	0	0	4	
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1245-1300	1	0	0	0	0	0	1	3	0	0	0	0	0	3	2	0	0	0	0	0	0	2	2	0	0	0	2	
1300-1315	1	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	1	0	0	2	5	0	0	0	5	
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1545-1600	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	3	0	1	0	4	
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1830-1845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	3	1	0	0	0	1	
1845-1900	0	0	0	0	0	0	0	0	6	0	0	0	0	6	1	0	0	0	0	0	0	1	0	1	0	0	1	
0700-1900	83	6	0	0	1	0	90	91	9	1	0	0	0	101	113	39	2	0	1	0	155	177	32	3	0	1	0	213

Site 4 - Footpaths & Green Lane - 07:00-19:00 - Hourly Totals

	MOVEMENT 31							MOVEMENT 32							MOVEMENT 33							MOVEMENT 34							
	USER TRAVELLING NORTHBOUND ON GREEN LANE FOOTPATH							USER TRAVELLING SOUTHBOUND ON GREEN LANE FOOTPATH							USER TRAVELLING EASTBOUND ON GREEN LANE FOOTPATH							USER TRAVELLING WESTBOUND ON GREEN LANE FOOTPATH							
	PEDESTRIAN	PCYCLE	E-SCOOTER	MOBILITY SCOOTER	PEDESTRIAN & BUGGY	EQUESTRIAN	TOTAL	PEDESTRIAN	PCYCLE	E-SCOOTER	MOBILITY SCOOTER	PEDESTRIAN & BUGGY	EQUESTRIAN	TOTAL	PEDESTRIAN	PCYCLE	E-SCOOTER	MOBILITY SCOOTER	PEDESTRIAN & BUGGY	EQUESTRIAN	TOTAL	PEDESTRIAN	PCYCLE	E-SCOOTER	MOBILITY SCOOTER	PEDESTRIAN & BUGGY	EQUESTRIAN	TOTAL	
0700-0800	8	0	0	0	0	0	8	6	2	0	0	0	0	8	28	9	1	0	0	0	0	38	11	2	0	0	0	0	13
0715-0815	8	0	0	0	0	0	8	7	2	0	0	0	0	9	37	11	1	0	0	0	0	49	13	3	0	0	0	0	16
0730-0830	7	0	0	0	0	0	7	5	2	0	0	0	0	7	38	11	2	0	0	0	0	51	8	3	0	0	0	0	11
0745-0845	2	0	0	0	0	0	2	3	1	0	0	0	0	4	27	10	2	0	0	0	0	39	8	1	0	0	0	0	9
0800-0900	0	0	0	0	0	0	0	4	0	0	0	0	0	4	13	4	1	0	0	0	0	18	6	2	0	0	0	0	8
0815-0915	0	0	0	0	0	0	0	4	0	0	0	0	0	4	6	3	1	0	0	0	0	10	7	2	0	0	0	0	9
0830-0930	5	0	0	0	0	0	5	5	0	0	0	0	0	5	12	4	0	0	0	0	0	16	11	2	0	0	0	0	13
0845-0945	8	0	0	0	0	0	8	7	0	0	0	0	0	7	14	3	0	0	0	0	0	17	9	2	0	0	0	0	11
0900-1000	9	0	0	0	0	0	9	8	0	0	0	0	0	8	17	4	0	0	0	0	0	21	12	1	0	0	0	0	13
0915-1015	10	0	0	0	0	0	10	7	0	0	0	0	0	7	16	3	0	0	0	0	0	19	11	0	0	0	0	0	11
0930-1030	7	0	0	0	1	0	8	5	0	0	0	0	0	5	9	4	0	0	0	0	0	13	9	0	0	0	0	0	9
0945-1045	7	0	0	0	1	0	8	4	0	0	0	0	0	4	9	4	0	0	0	0	0	13	9	0	0	0	0	0	9
1000-1100	6	0	0	0	1	0	7	1	0	0	0	0	0	1	5	3	0	0	0	0	0	8	5	0	0	0	0	0	5
1015-1115	5	0	0	0	1	0	6	1	0	0	0	0	0	1	4	2	0	0	0	0	0	6	5	1	0	0	0	0	6
1030-1130	3	0	0	0	0	0	3	1	0	0	0	0	0	1	5	0	0	0	0	0	0	5	16	3	0	0	0	0	19
1045-1145	1	0	0	0	0	0	1	1	0	0	0	0	0	1	4	0	0	0	0	0	0	4	20	4	0	0	0	0	24
1100-1200	2	0	0	0	0	0	2	3	0	0	0	0	0	3	4	0	0	0	0	0	0	4	20	4	0	0	0	0	24
1115-1215	4	0	0	0	0	0	4	6	0	0	0	0	0	6	7	0	0	0	0	0	0	7	19	3	0	0	0	0	22
1130-1230	5	0	0	0	0	0	5	6	0	0	0	0	0	6	6	0	0	0	0	0	0	6	6	1	0	0	0	0	7
1145-1245	8	0	0	0	0	0	8	5	0	0	0	0	0	5	7	0	0	0	0	0	0	7	3	0	0	0	1	0	4
1200-1300	8	0	0	0	0	0	8	6	0	0	0	0	0	6	8	0	0	0	0	0	0	8	4	0	0	0	1	0	5
1215-1315	7	0	0	0	0	0	7	4	0	0	0	0	0	4	6	0	0	0	1	0	0	7	8	0	0	0	1	0	9
1230-1330	9	0	0	0	0	0	9	13	0	0	0	0	0	13	6	1	0	0	1	0	0	8	10	0	0	0	1	0	11
1245-1345	6	0	0	0	0	0	6	17	0	0	0	0	0	17	5	1	0	0	1	0	0	7	10	0	0	0	0	0	10
1300-1400	13	0	0	0	0	0	13	14	0	0	0	0	0	14	9	1	0	0	1	0	0	11	10	2	0	0	0	0	12
1315-1415	13	0	0	0	0	0	13	17	0	0	0	0	0	17	10	1	0	0	0	0	0	11	12	4	0	0	0	0	16
1330-1430	12	1	0	0	0	0	13	9	0	0	0	0	0	9	9	0	0	0	0	0	0	9	10	4	0	0	0	0	14
1345-1445	11	1	0	0	0	0	12	8	0	0	0	0	0	8	8	1	0	0	0	0	0	9	12	4	0	0	0	0	16
1400-1500	5	1	0	0	0	0	6	9	0	0	0	0	0	9	4	2	0	0	0	0	0	6	16	7	2	0	0	0	25
1415-1515	6	1	0	0	0	0	7	13	0	0	0	0	0	13	2	3	0	0	0	0	0	5	62	7	2	0	0	0	71
1430-1530	6	0	0	0	0	0	6	17	0	0	0	0	0	17	3	5	0	0	0	0	0	8	74	8	2	0	0	0	84
1445-1545	10	2	0	0	0	0	12	14	1	0	0	0	0	15	6	7	0	0	0	0	0	13	71	11	2	0	0	0	84
1500-1600	8	2	0	0	0	0	10	14	1	0	0	0	0	15	4	7	0	0	0	0	0	11	68	6	1	0	0	0	75
1515-1615	6	2	0	0	0	0	8	7	1	0	0	0	0	8	4	9	0	0	0	0	0	13	22	4	1	0	0	0	27
1530-1630	4	2	0	0	0	0	6	8	1	0	0	0	0	9	7	7	0	0	0	0	0	14	13	5	1	0	0	0	19
1545-1645	2	1	0	0	0	0	3	14	0	0	0	0	0	14	5	6	0	0	0	0	0	11	15	2	1	0	0	0	18
1600-1700	4	1	0	0	0	0	5	16	0	0	0	0	0	16	9	6	0	0	0	0	0	15	15	3	0	0	0	0	18
1615-1715	12	3	0	0	0	0	15	22	0	0	0	0	0	22	9	3	0	0	0	0	0	12	11	5	0	0	0	0	16
1630-1730	17	3	0	0	0	0	20	18	0	0	0	0	0	18	7	3	0	0	0	0	0	10	10	3	0	0	0	0	13
1645-1745	17	2	0	0	0	0	19	12	0	0	0	0	0	12	8	1	0	0	0	0	0	9	8	3	0	0	0	0	11
1700-1800	16	2	0	0	0	0	18	9	0	1	0	0	0	10	5	2	0	0	0	0	0	7	6	2	0	0	0	0	8
1715-1815	9	0	0	0	0	0	9	2	0	1	0	0	0	3	7	2	0	0	0	0	0	9	3	0	0	0	0	0	3
1730-1830	7	0	0	0	0	0	7	1	0	1	0	0	0	2	7	2	0	0	0	0	0	9	4	2	0	0	0	0	6
1745-1845	5	0	0	0	0	0	5	1	0	1	0	0	0	2	7	3	0	0	0	0	0	10	5	2	0	0	0	0	7
1800-1900	4	0	0	0	0	0	4	1	6	0	0	0	0	7	7	1	0	0	0	0	0	8	4	3	0	0	0	0	7
HOURLY TOTALS							HOURLY TOTALS							HOURLY TOTALS							HOURLY TOTALS								

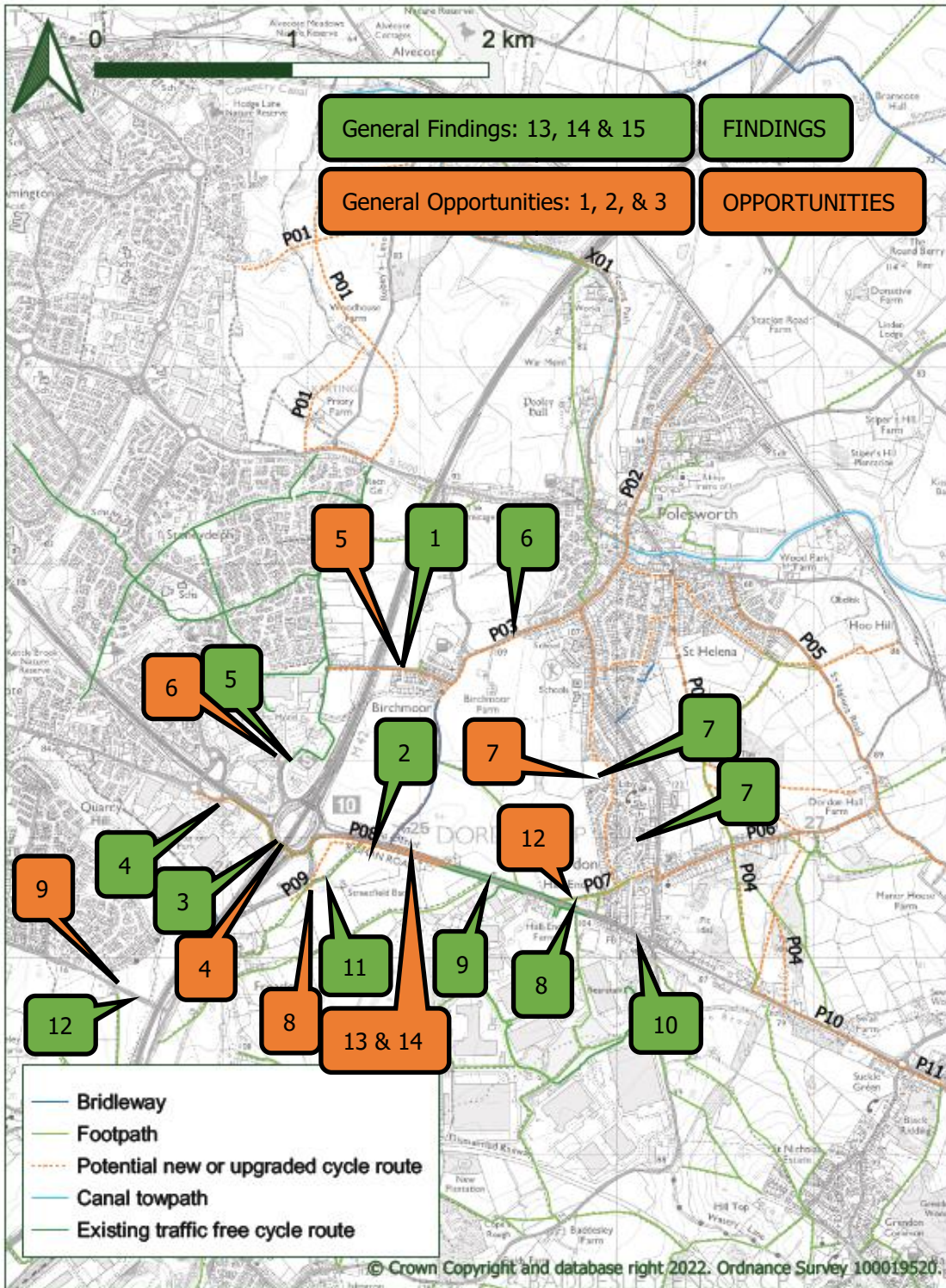


Appendix C – Collision Data





Appendix D – Findings and Opportunities Location Plan



DRAFT LCWIP
Polesworth cycle network and Rights of Way

Date: 25/05/2022 Contact: 01926 413950 alisonkennedy@warwickshire.gov.uk



Note: The general findings/ opportunities are area wide and do not have an arrow on the map.

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