

Greater Cambridge Partnership proposed schemes

8.2.1 There are a number of proposed schemes including cycle infrastructure and public transport improvements proposed in the vicinity of the site, which will encourage the use of sustainable modes. The cycle improvements include:

- Widening shared cycleway/footway to 3m along the northern edge of Babraham Road;
- Provision of improved cycle lanes between Fendon Road/Addenbrooke's roundabout and Long Road/Hills Road junction for cycle priority;
- Provision of a right-turn lane and simplification of Granham's Road junction to improve safety for road users;
- Provision of extra cycle storage at Babraham Road Park and Ride to encourage '*park and cycle*'; and,
- Potential improvements to Queen Edith's Way/Fendon Road/A1134 roundabout to provide a Dutch style roundabout.

8.2.2 There are potential public transport improvements proposed as part of Phase 2 of the Greater Cambridge Partnership proposals (see Appendix E). The details of the potential improvements are yet to be determined; however, options include:

- Mass Rapid Transit Route (Option 1 - preferred) – a new dedicated Mass Rapid Transit route between the A11 and the Cambridge Biomedical Campus via Sawston, Stapleford, Great Shelford with onward connection to the city centre. It would partly follow the route of the dismantled railway line. The multi-user path alongside the proposed transport route could form part of the Sawston Greenway;
- Bus lanes along A1307 and Public Transport Link to Cambridge Biomedical Centre (Option 2) - An inbound bus lane from Babraham Research Campus to Babraham Road Park and Ride and a new dedicated public transport link between the Park and Ride and Cambridge Biomedical Campus, with onward connection to the city centre; and,
- Bus lanes along A1307 (Option 3) - inbound bus lanes from Babraham Research Campus to the Addenbrooke's Hospital roundabout with onward connection to the city centre.

6.3 Identified issues

6.3.1 This section of the report identifies issues associated with the use of sustainable modes of travel and considers improvements to address these. These issues were identified during site visits, discussions with the Highway Authority and during the public consultation (event held on 14th and 15th May 2019).

Babraham Road cycle/pedestrian route

6.3.2 There are a number of give ways along the cycle route including a farm access (now closed), two vehicle accesses to Newbury Farm and two vehicle access points to the car showroom, which require cyclists to give way to vehicle traffic. Although vehicle traffic is generally light at these access points, cyclists need to slow down and check the access before progressing.

6.3.3 There is poor visibility for vehicles emerging from some driveways at the northern end of Babraham Road and an accident resulting in a serious personal injury occurred in 2013 between a vehicle reversing out of a driveway and a cyclist on the shared cycle/pedestrian route. This is exacerbated in areas by overgrown hedging.

6.3.4 There are no crossing facilities along Babraham Road. The nearest crossing point is a toucan crossing to the north of Red Cross Lane.

6.3.5 The shared cycle/footway narrows at the northern end of Babraham Road, particularly near the junction with Worts' Causeway. Visibility around the corner of this junction is poor and combined with the narrowness of this route exacerbates the likelihood of pedestrian/cyclist collisions. There are give-way lines across the footway that appear to suggest cyclists should dismount but this is not clear, and the crossing is a pelican rather than a toucan.

Worts' Causeway pedestrian and cyclist use

6.3.6 The pelican crossing at the junction of Worts' Causeway and Babraham Road is off the desire line for pedestrians and cyclists heading along Babraham Road.

6.3.7 There are no footways on the south side of Worts' Causeway.

6.3.8 The footway along the north side does not extend along the 20mph residential area of Worts' Causeway.

Public transport access

6.3.9 The route to the Park and Ride site is within walking distance at 800m from the centre of the site but this distance may be difficult for this with mobility issues.

6.4 Possible improvements (associated with wider highway network)

It is considered that although the following improvements are not required in order to ensure that the development does not have an unacceptable impact in highways terms, these measures are likely to encourage both existing and future residents to travel sustainably:

- As part of the Greater Cambridge Partnership proposals to improve the shared cycleway/footway along Babraham Road, it is recommended that priority is given to cyclists at minor side accesses.
- It is understood that as part of the Nine Wells development, a toucan crossing is being provided across Babraham Road north of the site. This will assist pedestrians and cyclists crossing to link with the network of paths leading to the south of Addenbrooke's Hospital area.
- The development will increase the number of pedestrians using Worts' Causeway and, outside of the restricted times, the number of vehicles, therefore, it is recommended that the footway on the northern side of Worts' Causeway is extended to meet the access point at the north-western corner of the site.
- Consider a more direct route to the Park and Ride site to reduce the walk distance from the site. Providing an additional bus stop along Babraham Road has been considered, however, additional stops affect the quality and speed of an existing route and reduce its attractiveness. Given the buses also use Worts' Causeway during congested times, it is not practical to provide a bus stop when services do not reliably pass along this route.
- Cyclists from the development can avoid the arrangement at the Worts' Causeway/Babraham Road junction by heading along Worts' Causeway on the way to the city centre and joining the northern side of Hills Road. The provision of a south-east to north-west link through the site and the new section of footway on Worts' Causeway will encourage future residents to use this route, together with providing an alternative route for cyclists heading along Babraham Road. The arrangement of the Worts' Causeway/Babraham Road junction is confusing and inconvenient for passing pedestrians and cyclists heading along Babraham Road and improvements at this junction could be beneficial to pedestrians and cyclists as well as provide additional capacity for vehicles. This is detailed in Section 7.

6.5 Design of on-site layout and access points to encourage sustainable travel

6.5.1 It is proposed to design the site to prioritise walking and cycling, with a network of routes running through the site. Cyclist and pedestrian accesses will be provided at all four points to ensure easy, convenient connections with the surrounding transport network. The routes along the western, southern and northern edges will be car-free and link Worts' Causeway and Babraham Road. In addition, there will be a link across the site for those cyclists travelling along Babraham Road to divert into the site and reach the northern side of Worts' Causeway. This route has been designed to cut laterally across the site with minimal overlap with vehicular traffic. This route will provide a direct route for existing cyclists heading to the city centre to avoid the issues identified along the northern end of Babraham Road and its junction with Worts' Causeway as well as being the preferred route for cycling trips originating within the site.

6.5.2 The permissive footpath along the western side of the site, from Babraham Road to Worts' Causeway, will be replaced with a 3m shared footpath/cycleway along with a grass ride with the potential to be used for horse riders on a permissive basis by the landowner. This is detailed in Appendix 5.3 of the Landscape Strategy.

Babraham Road

6.5.3 The proposed vehicle access on Babraham Road will be provided on the eastern edge of the site and include a 3m wide shared footway/cycleway. This will connect to the existing cycleway along Babraham Road. This cycleway is to be upgraded and the proposals will connect to Greater Cambridge Partnership's improvement proposals. A dropped kerb crossing will be provided to allow pedestrians and cyclists to cross safely.

Worts' Causeway

6.5.4 The proposed vehicle access on to Worts' Causeway will provide a vehicle connection with GB1 and include a 2m footway and an informal dropped kerb crossing with tactile paving to reach GB1. The unpaved footpath that runs between the two rows of hedges along the northern perimeter of the site will cross this vehicle access. This intersection will be designed sensitively to maintain the rural setting of this route.

6.5.5 It is recommended that the 20mph speed limit along Worts' Causeway be extended to include this access and speed reducing measures may be necessary to ensure that vehicles travel at appropriate speeds.

Cycle parking

- ■ ■ Cycle parking for the residents will be provided in convenient and easily accessible locations, as well as visitor cycle parking for the community uses.

7.0 POTENTIAL IMPACT OF VEHICULAR TRAFFIC

7.1.1 This section of the report considers the potential impact of the proposed development on the surrounding highway network.

7.2 Analysis years and growth rates

7.2.1 The impact of the proposed development will be assessed in accordance with Cambridgeshire's Transport Assessment Guidelines (Cambridgeshire County Council (June 2017) for the following analysis years and as agreed with the Highway Authority:

- 2019 (year of application);
- 2024 development year (anticipated year of full occupation); and,
- 2029 design year (development year + 5 years).

7.2.2 These analysis years are for assessment purposes only.

7.2.3 In order to obtain the future traffic flows (i.e. with no development traffic) in 2024 and 2029, the surveyed traffic flows (2018) have been factored using locally adjusted National Transport Model (NTM) growth factors. The growth factors, (as agreed with the Highway Authority) based on TEMPro version 7.2, for Cambridge are to be applied to the base (surveyed) flows and are identified in Table 7.1 below:

Table 7.1 NTM growth factors

Period	NTM growth factors
2018-2019	
Weekday AM	1.0171
Weekday PM	1.0168
2018-2024	
Weekday AM	1.1131
Weekday PM	1.1126
2018-2029	
Weekday AM	1.1653
Weekday PM	1.1648

7.3 Committed developments

7.3.1 There are various committed developments in the vicinity of the site and traffic associated with the following developments has been included in the calculation of future traffic flows, as agreed with the Highway Authority:

- Land South of Greenlands, South West of The Bell School and West of Babraham Road, Cambridge (06/0795/OUT) – 270 dwellings, 74 units unoccupied, as of December 2018, including 40 private units and 34 affordable;
- Land Between Long Road and Shelford Road (Clay Farm/Showground Site), Cambridge (07/0620/OUT) – 2,300 dwellings, plus other facilities, 500 unoccupied dwellings, as of December 2018;
- Land to the West and South West of Addenbrooke's Campus Robinson Way, Cambridge, Cambridgeshire (06/0976/OUT) Up to 215,000 sqm of D1/B1b use (unoccupied);
- Land South of Dame Mary Archer Way, Cambridge Biomedical Campus, Cambridge (16/0176/OUT) up to 75,000 m² of B1/D1 and A1-A4 use (unoccupied); and,
- Land North of Worts' Causeway (GB1) – 200 units.

Land South of Greenlands, South West of The Bell School and West of Babraham Road, Cambridge

7.3.2 The trip rates for this site were obtained from the 2006 Transport Assessment (06/0795/OUT).

7.3.3 For the purposes of this assessment, it is assumed that the same distribution and assignment of traffic be applied as used for the proposed development.

Land Between Long Road and Shelford Road

7.3.4 The trip rates for this site were obtained from the December 2007 Transport Assessment.

7.3.5 To provide a robust analysis, 50% of traffic associated with the 500 residential units at the Clay Farm development are assumed to head north to Lime Avenue/Long Road signalised junction and another 50% will head south towards Addenbrooke's Road. The assignment of traffic from the Lime Avenue/Long Road signalised junction was based on 2011 Census Data. The routes were based on Google Maps journey planner, which shows that approximately:

- 20% of traffic head **west** towards Long Road; and,
- 30% of traffic head **east** towards A1307/Queen Edith's Way signalised junction, with:
 - 10% heading north - Hills Road,
 - 10% heading east - Queen Edith's Way; and,
 - 10% heading south – Hills Road.

Land to the West and South West of Addenbrooke's Campus Robinson Way, Cambridge, Cambridgeshire and Land South of Dame Mary Archer Way, Cambridge Biomedical Campus, Cambridge

7.3.6 The flows for Phase 1 of the Cambridge Biomedical Campus (CBC) were obtained from the 2007 Transport Assessment Addendum (06/0796/OUT) and the flows for Phase 2 were obtained from the 2016 Environmental Statement – Transport Assessment (16/0176/OUT).

7.3.7 Phase 1 and Phase 2 of the CBC are assumed to be entirely unoccupied. The distribution of traffic for Phase 1 and 2 was based on the Environmental Statement report for Phase 2 (16/0176/OUT), which showed that approximately:

- 20% of traffic head north via Long Road/Robinson Way signalised junction;
- 45% of traffic head east via Addenbrooke's Hospital roundabout with:
 - 15% east along Fendon Road;
 - 15% south along Babraham Road; and,
 - 15% north along A1304.
- 35% of traffic head south via Francis Crick Avenue/Dame Mary Archer Way/Addenbrooke's Road.

Land North of Worts' Causeway GB1 (200 units)

7.3.8 Access to GB1 site (200 units) will be accommodated through the Land at Newbury Farm via Babraham Road. Therefore, the same distribution of traffic generated has been applied as that used for the proposed development, with different appropriate routing for the AM and PM traffic, taking into account the westbound morning restrictions on Worts' Causeway.

7.3.9 All committed development flows are included in Appendix F.

7.3.10 The final future flows, which include the base year flows (Appendix B), committed development flows (Appendix F) and development flows (Appendix D), are included in Appendix G.

7.4 Initial analysis

7.4.1 The surveys were carried out on Wednesday 28th November, 2018 and the established peak hours for traffic are 7.45-8.45am and 4.45-5.45pm.

7.4.2 As agreed with the Highway Authority, all junctions with more than 30 vehicles (two-way) generated by the proposed development will undergo detailed capacity testing, using industry standard software. The two-way vehicle movements associated with the development for each junction, for the AM and PM peak are summarised in Table 7.2 below.

Table 7.2 Impact of development traffic on highway network

Junction no.	Junction	Time period	Total development flows (two-way)
1	Babraham Road/ Granham's Road priority junction	AM	74
		PM	28
2	Worts' Causeway/ Babraham Road signalised junction	AM	74
		PM	55
3	Addenbrooke's/Fendon Road/Hills Road roundabout	AM	74
		PM	55
4	Hills Road/Long Road/Queen Edith's Way signalised junction	AM	49
		PM	37
5	Queen Edith's roundabout	AM	25
		PM	18
6	Cherry Hinton Road/ Babraham Road roundabout	AM	25
		PM	18

7.4.1 It can be seen from the table above that junctions 5 and 6 have fewer than 30 vehicle movements generated by the proposed development in both the AM and PM peak time. Therefore, as agreed with the Highway Authority, these junctions do not require detailed capacity analysis.

7.5 Junction capacity analysis

7.5.1 The results of this capacity testing are set out below.

7.6 Proposed site access onto Babraham Road

7.6.1 The operation of the proposed site access (refer to Figure 4.1 for the junction layout) has been assessed for both the AM and PM peak periods, using the Junctions 9 PICADY program. The results of the analysis are presented in full in Appendix H and summarised in Table 7.3 below. This includes the likely Ratio Flow to Capacity (RFC), delay and queue.

Table 7.3 Junction capacity at the proposed access onto Babraham Road

	2024 Base + com + dev						2029 Base + com + dev					
	8am-9am			5pm-6pm			8am-9am			5pm-6pm		
	RFC	Queue (vehs)	Delay (s)	RFC	Queue (vehs)	Delay (s)	RFC	Queue (vehs)	Delay (s)	RFC	Queue (vehs)	Delay (s)
Site access (l, r)	0.54	1	41	0.14	<1	25	0.59	1	49	0.16	<1	28
Babraham Road South (a, r)	0.03	0	8	0.01	0	10	0.03	0	8	0.02	0	10

7.6.2 It can be seen from the table above that the proposed site access/Babraham Road junction has sufficient capacity to accommodate the proposed development of 230 dwellings and other committed developments (including GB1), with a maximum RFC of 0.59, a maximum queue of one vehicles and a total delay of 49 seconds in the 2029 in the AM peak period.

7.7.1 It should also be noted that a priority junction was considered appropriate for Nine Wells development with a similar number of units and likely volume of vehicles.

7.7 Granham's Road/Babraham Road

7.7.1 The operation of the junction (refer to Figure 7.1 for the junction layout), with the improvements being implemented by the Highway Authority, has been assessed for both the AM and PM peak periods (2019, 2024 and 2029) using the TRL program Junctions 9 PICADY. The results of the analysis are presented in full in Appendix I and summarised in Table 7.4 below.



Figure 7.1 Granham's Road/Babraham Road junction

Table 7.4 Junction capacity at the Granham's Road/Babraham Road junction

	Base				Base + com				Base + com + dev			
	8am-9am		5pm-6pm		8am-9am		5pm-6pm		8am-9am		5pm-6pm	
	RFC	Queue (vehs)	RFC	Queue (vehs)	RFC	Queue (vehs)	RFC	Queue (vehs)	RFC	Queue (vehs)	RFC	Queue (vehs)
2019												
Granham's Rd (right)	0.24	<1	0.18	<1	-	-	-	-	-	-	-	-
Granham's Rd (left)	0.32	1	0.27	<1	-	-	-	-	-	-	-	-
B'ham Rd (right)	0.29	<1	0.39	1	-	-	-	-	-	-	-	-
2024												
Granham's Rd (right)	0.29	<1	0.21	<1	0.35	1	0.22	<1	0.39	1	0.22	<1
Granham's Rd (left)	0.41	1	0.36	1	0.55	1	0.43	1	0.63	2	0.45	1
B'ham Rd (right)	0.33	1	0.44	1	0.36	1	0.45	1	0.37	1	0.45	1
2029												
Granham's Rd (right)	0.35	1	0.23	<1	0.43	1	0.25	<1	0.56	1	0.26	<1
Granham's Rd (left)	0.55	1	0.47	1	0.66	2	0.52	1	0.77	3	0.55	1
B'ham Rd (right)	0.36	1	0.46	1	0.39	1	0.48	1	0.40	1	0.48	1

7.7.2 It can be seen from the table above that the modified Granham's Road/Babraham Road junction has sufficient capacity to accommodate the proposed development of 230 dwellings, with a maximum RFC of 0.77 and a maximum queue of three vehicles in the 2029 AM peak time. It can also be seen that the traffic generated by the proposed development will have a marginal impact on the operation of the junction.

7.8 Worts' Causeway/Babraham Road signalised junction

7.8.1 The operation of the existing junction (refer to Figure 7.2) has been assessed for both the AM and PM peak periods in 2019, 2024 and 2029, using the JCT program LinSIG. The results of the analysis are presented in full in Appendix J and summarised in Table 7.5 below. This includes degree of saturation (deg. sat %) and Mean Maximum Queue (MMQ).

7.8.2 Based on on-site observations, the cycle time has been set at 90 seconds, with the Worts' Causeway approach to the junction running every cycle.

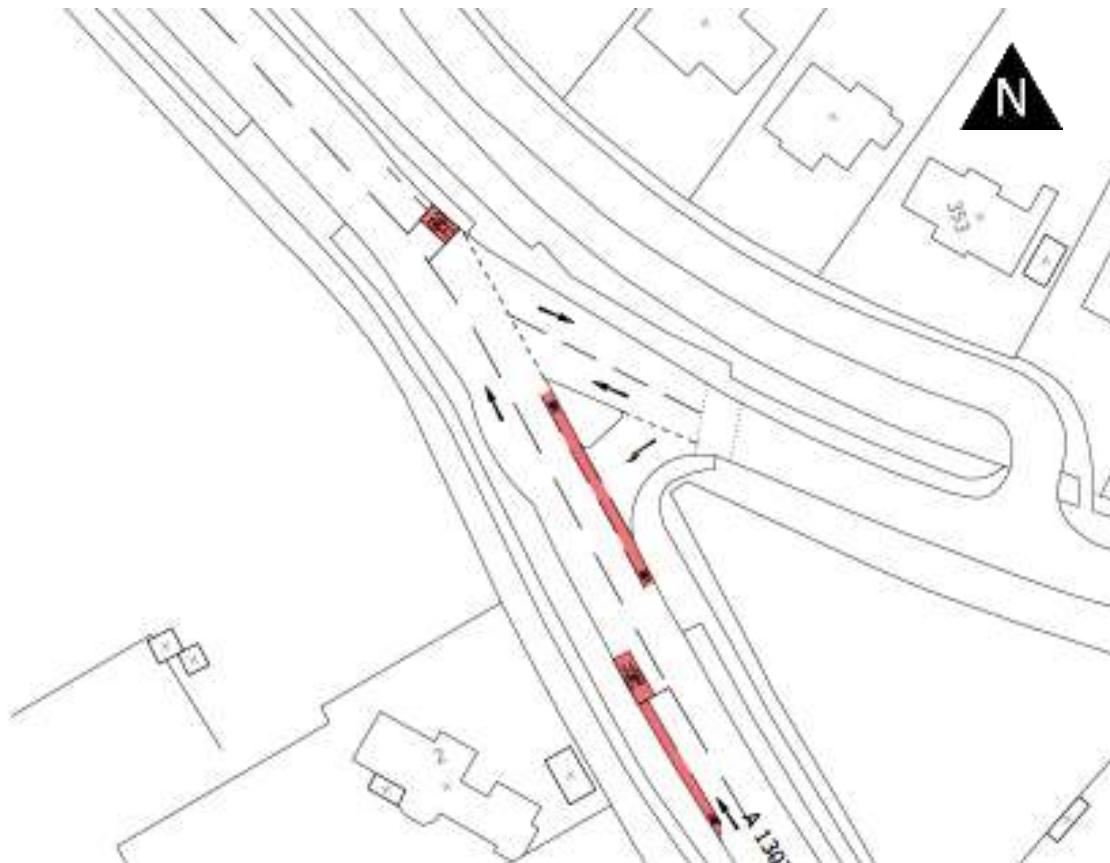


Figure 7.2 Worts' Causeway/Babraham Road junction

Table 7.5 Junction capacity at Worts' Causeway/Babraham Road junction

	Base				Base + com				Base + com + dev			
	8am-9am		5pm-6pm		8am-9am		5pm-6pm		8am-9am		5pm-6pm	
	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)
2019												
Babraham Rd South (ahead)	47.6	6	40.1	4	-	-	-	-	-	-	-	-
Babraham Rd North (ahead, left)	49.1	10	70.0	19	-	-	-	-	-	-	-	-
Worts' Causeway	47.3	2	15.0	1	-	-	-	-	-	-	-	-
2024												
Babraham Rd South (ahead)	51.8	7	43.9	5	64.7	13	46.0	6	66.8	14	46.9	6
Babraham Rd North (ahead, left)	53.8	11	76.7	23	61.1	13	89.0	36	62.8	14	90.5	39
Worts' Causeway	52.6	3	17.0	1	61.9	5	40.0	2	64.7	5	48.2	3
2029												
Babraham Rd South (ahead)	54.2	7	46.0	6	66.7	14	48.0	6	69.3	15	48.9	6

Babraham Rd North (ahead, left)	56.4	12	80.2	26	63.2	14	92.6	42	65.4	15	94.1	46
Worts' Causeway	55.1	3	17.5	1	66.7	5	48.3	2	66.7	5	48.7	3

7.8.3 It can be seen from the results that the existing Worts' Causeway/Babraham Road junction is predicted to operate with a maximum degree of saturation of 94.1% with a queue of 46 vehicles on the Babraham Road north approach, in the 2029 + committed + development PM scenario. This is below the practical reserve capacity for signalised junctions of 95%. It should also be noted that the impact of the development on the junction is minimal and that it only increases the degree of saturation by 1.5% and the queue by four vehicles when compared to the 2029 + committed PM scenario.

7.8.4 It is considered that this analysis represents a worst-case scenario as:

- The pedestrian stage is called every other cycle, however, based on on-site observations a significant proportion of pedestrian were observed crossing Worts' Causeway without activating the pedestrian crossing; and,
- The Worts' Causeway phase is called every cycle, whereas in practice this operates 'on-call' and is called less frequently.

7.9 Addenbrooke's Hospital partially signalised roundabout

7.9.1 The operation of the existing junction (refer to Figure 7.3 for the junction layout) has been assessed for both the AM and PM peak periods (2019, 2024 and 2029) using the JCT program LinSIG. The results of the analysis are presented in full in Appendix K and summarised in Table 7.6 below.

7.9.2 LinSig does not allow the modelling of on-call/vehicle actuation, therefore, it is considered that allowing the pedestrian stage to run every cycle is the worst-case scenario.

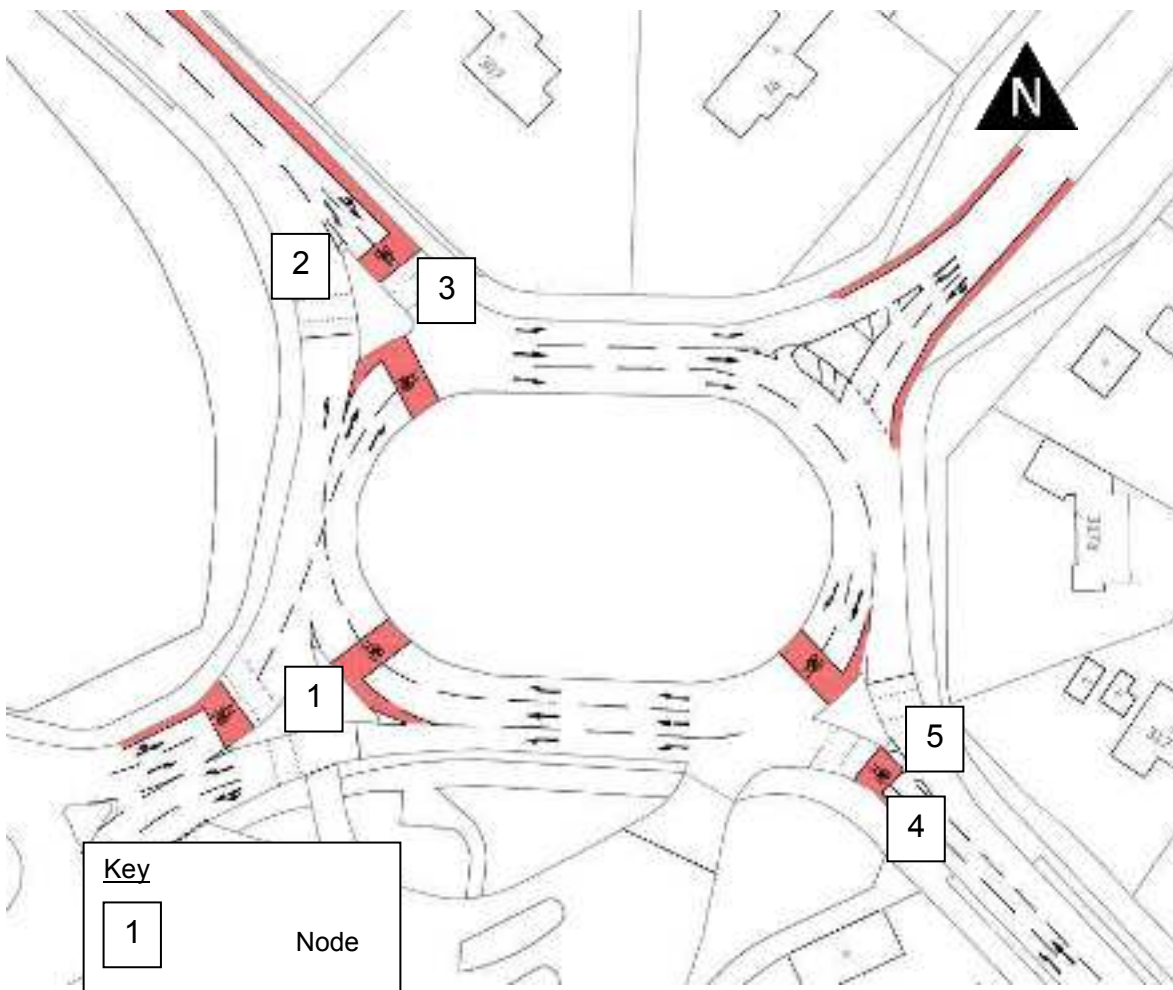


Figure 7.3 Addenbrooke's Hospital partially signalised roundabout

Table 7.6 Addenbrooke's Hospital partially signalised roundabout

Node no.		Base				Base + com				Base + com + dev			
		8am-9am		5pm-6pm		8am-9am		5pm-6pm		8am-9am		5pm-6pm	
		Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)
2019													
1	Bus Park (l, a)	22.2	1	20.1	1	-	-	-	-	-	-	-	-
	Hills Rd S C (r)	34.0	5	56.3	9	-	-	-	-	-	-	-	-
	Main Dr (l)	35.7	5	48.5	7	-	-	-	-	-	-	-	-
	Main Dr (a)	24.0	3	45.4	7	-	-	-	-	-	-	-	-
	Hills Rd S C (a) 1	29.9	4	12.0	2	-	-	-	-	-	-	-	-
	Hills Rd S C (a) 2	35.2	3	17.1	1	-	-	-	-	-	-	-	-
3	Main Dr C (a)	45.7	3	50.2	4	-	-	-	-	-	-	-	-
	Main Dr C (r)	15.8	1	33.9	2	-	-	-	-	-	-	-	-
	Hills Rd N (l, a)	44.8	2	55.2	3	-	-	-	-	-	-	-	-
4	Fendon Rd C (a, r)	64.1	8	54.2	5	-	-	-	-	-	-	-	-
	Fendon Rd C (r)	1.3	<1	0.7	<1	-	-	-	-	-	-	-	-
	Hills Rd S (l)	65.9	8	50.6	6	-	-	-	-	-	-	-	-
Non-signalised nodes	Hills Rd N C (a)	17.9	0	28.5	<1	-	-	-	-	-	-	-	-
	Hills Rd N C (r)	9.3	0	9.7	0	-	-	-	-	-	-	-	-
	Fendon Rd (l, a)	24.5	<1	52.7	1	-	-	-	-	-	-	-	-
2024													
1	Bus Park (l, a)	23.3	1	21.7	1	23.3	1	21.7	1	23.3	1	21.7	1
	Hills Rd S C (r)	33.3	5	61.6	11	38.5	6	74.8	12	39.8	6	74.0	12
	Main Dr (l)	45.6	6	53.0	8	43.8	6	61.8	11	43.8	6	63.2	11
	Main Dr (a)	30.6	4	49.6	8	33.8	5	73.5	15	33.8	5	75.2	16
	Hills Rd S C (a) 1	29.2	4	13.0	2	36.2	6	20.4	3	38.9	6	22.6	3
	Hills Rd S C (a) 2	38.6	3	18.7	1	57.0	6	23.2	1	57.0	6	23.2	1
3	Main Dr C (a)	52.8	4	55.0	4	85.1	5	66.9	6	87.4	5	71.1	6
	Main Dr C (r)	18.4	1	37.0	3	31.3	2	48.5	4	31.3	2	50.8	4
	Hills Rd N (l, a)	46.7	2	60.4	3	59.7	4	72.7	4	62.0	5	71.6	4
4	Fendon Rd C (a, r)	70.3	8	59.3	5	89.8	13	71.9	6	89.8	13	71.9	6
	Fendon Rd C (r)	1.4	<1	0.7	<1	1.3	<1	0.7	<1	1.3	<1	0.7	<1
	Hills Rd S (l)	72.2	9	55.3	7	88.2	15	60.6	7	92.0	18	63.0	8

Table 7.6 Addenbrooke's Hospital partially signalised roundabout

Non-signalised nodes	Hills Rd N C (a)	19.6	0	31.1	<1	30.9	0	40.0	<1	31.9	0	40.8	<1
	Hills Rd N C (r)	10.2	0	10.6	0	10.2	0	11.9	0	10.2	0	11.9	0
	Fendon Rd (l, a)	42.2	1	59.2	2	48.3	2	67.1	2	50.3	2	68.9	3
2029													
1	Bus Park (l, a)	23.9	1	22.8	1	23.9	1	22.8	1	23.9	1	22.8	1
	Hills Rd S C (r)	38.2	6	64.5	11	38.3	6	75.9	13	39.7	6	77.2	13
	Main Dr (l)	42.1	6	55.6	9	48.5	7	65.4	12	48.5	7	65.4	12
	Main Dr (a)	28.3	4	51.9	8	37.3	5	77.2	17	37.3	5	77.2	17
	Hills Rd S C (a) 1	33.4	5	13.6	2	35.9	6	20.5	3	38.5	6	23.2	3
	Hills Rd S C (a) 2	40.4	3	19.6	1	58.9	6	24.1	2	58.9	6	24.1	2
3	Main Dr C (r)	17.1	1	38.8	3	88.5	2	52.6	4	91.1	2	52.6	4
	Main Dr C (a)	49.2	4	57.5	5	32.5	5	72.7	7	32.5	5	73.6	7
	Hills Rd N (l, a)	53.9	3	63.3	3	61.4	4	71.3	4	63.7	5	74.6	4
4	Fendon Rd C (a, r)	73.4	9	62.1	5	92.6	13	74.7	7	92.6	13	74.7	7
	Fendon Rd C (r)	1.4	<1	0.7	<1	1.3	<1	0.7	<1	1.3	<1	0.7	<1
	Hills Rd S (l)	75.6	11	57.9	7	91.7	17	63.2	8	95.6	20	65.5	9
Non-signalised nodes	Hills Rd N C (a)	20.5	0	32.6	<1	31.7	0	41.5	<1	32.8	0	42.2	<1
	Hills Rd N C (r)	10.7	0	11.1	0	10.7	0	12.4	0	10.7	0	12.4	0
	Fendon Rd (l, a)	44.7	1	63.0	2	51.1	2	71.5	3	53.2	2	73.3	3

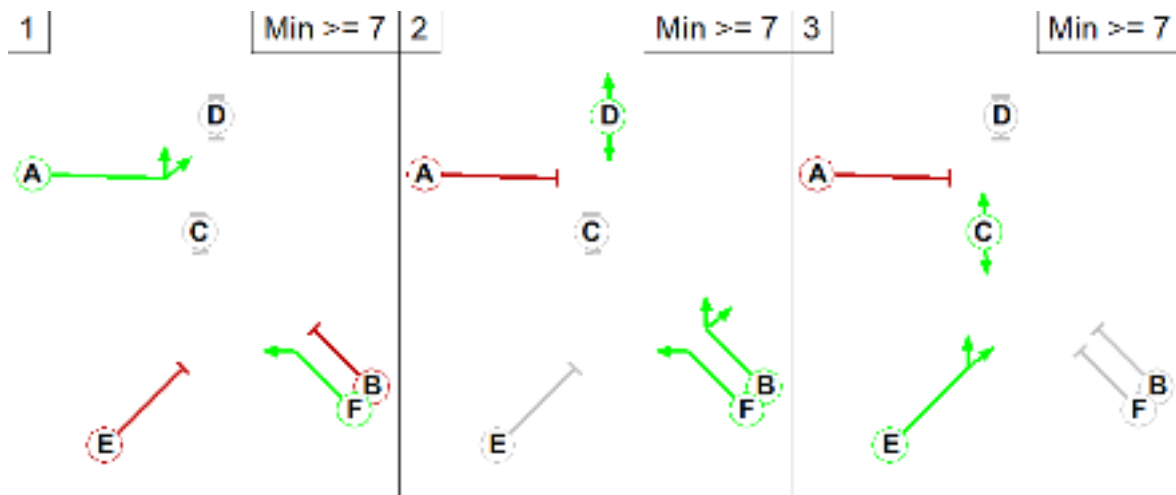
7.9.3 Based on on-site observations, it was determined that each approach link was operating with different cycle times, and has been modelled as separate nodes, as follows:

- Addenbrooke's hospital including bus exit - Node 1 (90s cycle time);
- Hills Road North exit – Node 2 (90s cycle time);
- Hills Road North – Node 3 (41s cycle time);
- Hills Road South – Node 4 (79s cycle time); and,
- Hills Road South exit – Node 5 (90s cycle time).

7.9.4 It should be noted that Nodes 2 and 5 were set up separately as both involved signal controlled crossings across the exit arms from the roundabout, that operate on call only.

7.9.5 In addition, it was observed that the operation of Node 1 was inefficient and did not appear to be functioning correctly. The sensors at the exit of the bus park were obscured by overhanging vegetation and this resulted in the bus stage being called even when no buses were waiting to exit the bus park. It is considered that the observed phasing is unreliable, given that the junction was not operating correctly and, therefore, more appropriate phases and cycle times have been used at Node 1. The phasing diagram is illustrated in Figure 7.4 below.

Figure 7.4 Node 1 phases at Addenbrooke's Hospital partially signalised roundabout



Note:

A – Main Drive/Addenbrooke's Hospital exit; B – circulatory link; C – pedestrian crossing on Main Drive/Addenbrooke's Hospital entry; D – pedestrian crossing on Main Drive/Addenbrooke's Hospital exit; E – bus park exit; F – Main Drive/Addenbrooke's Hospital entry

7.9.6 It can be seen from the table above that the junction operates at a maximum of 75.6% degree of saturation in 2029 AM base scenario, which is below the practical reserve capacity for signalised junctions at 95%, and a maximum queue of 11 vehicles on the Hills Road South arm. This increases to 91.7% and a queue of 17 vehicles in the 2029 AM + committed scenario on the Hills Road South arm and to 13 vehicles on the Fendon Road circulatory link. With the addition of development traffic, the operation of the junction increases to 95.6% and the queue increases to 20 vehicles in the 2029 AM + committed + development scenario on the Hills Road South arm, and remains at 13 vehicles on the Fendon Road circulatory link.

7.9.7 A percentage impact analysis indicates that the proportion of development traffic at this junction is approximately 3.9% of the future base traffic in the AM peak and 3.1% in the PM peak.

7.9.8 It should be noted that LinSig does not allow the modelling of on-call/vehicle actuation, therefore, it is considered that allowing a pedestrian stage to run in every cycle and the bus link to operate every cycle represents the worst-case scenario.

7.10 Hills Road/Long Road/Queen Edith's Way signalised junction

7.10.1 The operation of the proposed site access (refer to Figure 7.5 for the junction layout) has been assessed for both the AM and PM peak periods (2019, 2024 and 2029) using the JCT program LinSIG. The results of the analysis are presented in full in Appendix L and summarised in Table 7.7 below. It should be noted that recent improvements at the junction have been included in the analysis.

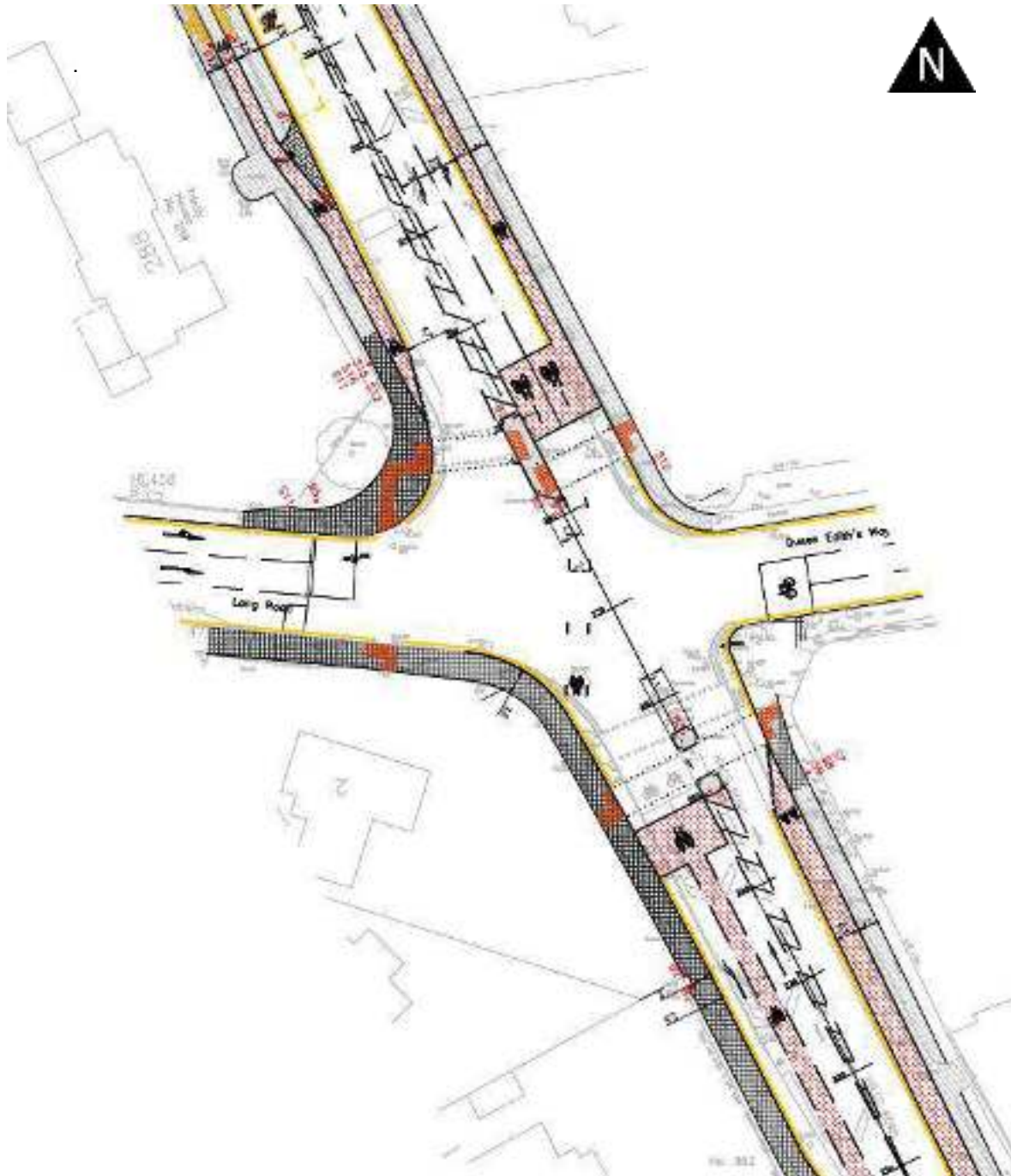


Figure 7.5 Hills Road/Long Road/Queen Edith's Way signalised junction

Table 7.7 Hills Road/Long Road/Queen Edith's Way signalised junction

	Base				Base + com				Base + com + dev			
	8am-9am		5pm-6pm		8am-9am		5pm-6pm		8am-9am		5pm-6pm	
	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)
2019												
Hills Rd (l, a)	80.6	14	68.4	11	-	-	-	-	-	-	-	-
Long Rd (r, l, a)	80.9	13	68.3	12	-	-	-	-	-	-	-	-
A1307 north (a, r, l)	81.8	8	57.5	7	-	-	-	-	-	-	-	-
Queen Ed's Way (a, r)	80.7	11	68.1	7	-	-	-	-	-	-	-	-
2024												
Hills Rd (l, a)	88.2	17	74.8	12	93.1	21	86.1	19	94.9	23	87.3	20
Long Rd (r, l, a)	88.7	15	74.6	13	93.9	19	86.0	16	94.1	19	86.3	16
A1307 north (a, r, l)	89.4	10	62.5	8	93.8	17	69.9	8	93.8	17	69.9	8
Queen Ed's Way (a, r)	88.3	14	74.0	8	92.4	16	84.8	10	94.4	17	87.1	10
2029												
Hills Rd (l, a)	92.3	20	78.3	14	97.0	26	89.1	21	98.9	29	90.1	23
Long Rd (r, l, a)	92.7	18	78.2	14	98.1	24	89.8	18	98.2	25	90.1	18
A1307 north (a, r, l)	93.6	13	65.6	8	98.2	23	73.0	9	98.2	23	73.0	9
Queen Ed's Way (a, r)	92.5	16	77.6	8	96.7	19	88.7	11	98.8	21	91.1	12

7.10.2 A site visit was undertaken, and video surveys were carried out at this junction to determine the exact staging and phasing of the junction in order to accurately represent the observed traffic conditions. It was noted, during the site visit, that the junction operates on a 190 second cycle. It should be noted that based on the observations, no all-red phase was required, as all pedestrian crossings were synchronised with vehicle movements.

7.10.3 It can be seen from the table above that the junction operates at a maximum of 93.6% in 2029 AM base scenario, which is below the practical reserve capacity for signalised junctions at 95%, and a mean max queue of 13 vehicles on the A1307 north arm. This increases to a maximum of 98.2% and a queue of 23 vehicles in the 2029 AM + committed scenario. With the addition of development traffic, the degree of saturation of the junction increases marginally to a maximum of 98.8% and the queues increase by a maximum of three vehicles per arm.

7.10.4 A percentage impact analysis indicates that the proportion of development traffic on this junction is approximately 2% of the future base traffic in both the AM and the PM peaks. Given that the proposed development has a minimal impact on the operation of the junction and is a very low proportion of the future base traffic flows, and that the junction operates above capacity in 2029 AM + committed development scenario, it is considered that the development will have a minimal impact on the operation of this junction and mitigation is not required.

7.11 Summary of impact

7.11.1 Of the four junctions analysed, the following is noted:

- Granham's Road/Babraham Road – operates within capacity for all future scenarios including with development with the proposed improvements. No mitigation measures required;
- Worts' Causeway/Babraham Road – operates within practical capacity, with an increase in cycle time in the PM peak. This assumes that the pedestrian phase is called every other cycle, however, on-site observations show that most pedestrians cross without calling the pedestrian phase. It also assumes that the Worts' Causeway arm is called every cycle (90 sec cycle time). Improvement measures at this junction would increase the capacity and provide pedestrian and cyclist benefits.
- Addenbrooke's Hospital partially signalised roundabout – operates at or above capacity in the future scenario, and that with the addition of traffic generated by the proposed development, the degree of saturation and queueing increase marginally. It should be noted, however, that the analysis assumes that a bus phase is called once every 90 second cycle as well as the pedestrian phase. It is, therefore, considered that improvements to the phasing and timing at this junction, could increase the capacity of the junction, especially on the circulatory links.
- Hills Road/Long Road/Queen Edith's Way signalised junction – operates close to practical capacity in the future scenario and the addition of development traffic increases the degree of saturation and queueing marginally. It should also be noted that development traffic is a very small proportion of all traffic at this junction and mitigation measures are not considered necessary.

7.12 Likely impact and mitigation

7.12.1 Based on the above analysis, it is anticipated that the following measures could improve the operation of two of the junctions, as detailed below.

Worts' Causeway/Babraham Road

7 12 2 It is considered that the layout of the Babraham Road/Worts' Causeway junction raises a number of issues regarding the capacity and operation at the junction. Some potential improvements at this junction could include:

- The provision of a second stop-line at the pedestrian crossing on Worts' Causeway, which will allow vehicles heading south along Babraham Road to continue without interruption when the pedestrian crossing is activated. There is currently storage for up to four vehicles on Worts' Causeway between Babraham Road and the pedestrian crossing on Worts' Causeway, without blocking back to Babraham Road.
- The desire line for pedestrians heading along Babraham Road is at the mouth of the junction. Instead pedestrians and cyclists are routed around the corner away from this direct desire line. Therefore, another option would be to simplify the layout of the junction to provide a simple signalised T-junction (with central refuge on the Worts' Causeway arm). This would provide pedestrian and cyclist facilities along the desire line and reduce the size of the junction and, hence, the inter-green times.

Addenbrooke's Hospital roundabout

7 12 2 It is considered that there is scope to improve the performance of the Addenbrooke's Hospital junction roundabout. Based on the observations, it is considered that:

- At Node 1, combine the pedestrian phase with the bus phase and ensure the bus link is operating on call.
- Shortening the cycle time at Node 4 – Hills Road South, which will result in lower queues. It is recommended to shorten the cycle time from 79s to 41s. The results of these changes are summarised in Table 7.9 below and are included in Appendix M.

Table 7.9 Addenbrooke's Hospital partially signalised roundabout mitigation

	2024 + com + dev				2029 + com + dev			
	8am-9am		5pm-6pm		8am-9am		5pm-6pm	
	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)	Deg Sat (%)	MMQ (vehs)
2019								
Fendon Rd C (a, r)	89.6	6	71.9	6	92.5	7	74.7	7
Hills Rd S (l)	89.3	7	63.0	8	92.9	8	65.5	9

7 12 4 It can be seen from the table above, that with the changes to the cycle time the capacity of the Fendon Road circulatory link is decreased to 92.5% and the queue is reduced to seven vehicles, which is below the practical reserve capacity for signalised junctions at 95%. It can also be seen that the capacity on Hills Road southern arm is also decreased to 92.9% vehicles and the queue is reduced from 20 to nine vehicles in the AM peak.

8.0 SUMMARY AND CONCLUSIONS

8.1 Introduction

8.1.1 This Transport Assessment has been produced by Conisbee for This Land Ltd in support of an outline planning application (all matters reserved except for means of access in respect of junction arrangements onto Worts' Causeway and Babraham Road) for erection of up to 230 residential dwellings (including affordable housing), community facilities within Use Classes A1/A2/A3/A4/B1/D1/D2, new landscaping and public realm, car and cycle parking, infrastructure, other associated works following the demolition of all existing buildings on the site.

8.1.2 It is considered that the proposed development of 230 dwellings complies with relevant national, regional and local land use and transport policies, as:

- It provides good accessibility by walking, cycling and public transport and is located to minimise journey length, particularly to local employment areas;
- It ensures that transport is accessible to all, taking into account the needs of disabled and other less mobile people;
- The onsite layout is designed to prioritise walking and cycling and provides convenient connections to the surrounding area. It discourages both through access for general traffic and speeding;
- The vehicle connections are designed in accordance with the standards and provide high quality facilities for pedestrians and cyclists; and,
- It is in accordance with the parking standards.

8.1.3 The site is highly sustainable and is located on a high-quality public transport corridor with excellent access to bus services and cycle routes and within walking distance of significant employment opportunities including the Addenbrooke's Hospital area. The existing cycle routes provide a continuous link between the site and Cambridge city centre.

8.2 Development proposals

8.2.1 The proposed development comprises 230 units with associated community uses provided within the central square of the development.

8.2.2 As part of the development of the site, and in accordance with the site allocation, it is proposed to provide the site access onto Babraham Road. This access is in the form of a priority junction with a ghost island right-turn lane and will provide access to the highway network for both GB1 and the Land at Newbury Farm sites.

- 7.1 It is proposed to provide a simple priority junction onto Worts' Causeway for vehicle access to GB1.

Pedestrian and cycle access

- 7.4 Convenient pedestrian and cycle routes, embedded in a green setting, will lay at the heart of the proposals. All streets within the development have a design speed of 20mph and a sense of pedestrian priority is created where traffic flows and speeds are likely to be particularly low.
- 7.5 It is proposed to design the site to prioritise walking and cycling, with a network of routes running through the site. Cyclist and pedestrian accesses will be provided at all four points to ensure easy, convenient connections with the surrounding transport network. The routes along the western, southern and northern edges will be car-free and link Worts' Causeway and Babraham Road. In addition, there will be a route across the site for those cyclists travelling along Babraham Road to divert into the site and reach the northern side of Worts' Causeway. This route has been designed to cut laterally across the site with minimal overlap with vehicular traffic. This route will provide a direct route for existing cyclists heading to the city centre to avoid the issues identified along the northern end of Babraham Road and its junction with Worts' Causeway, as well as being the preferred route for cycling trips originating within the site.

- 7.6 The existing former path from Babraham Road to Worts' Causeway will be upgraded and remain along the western boundary of the site.

Car parking provision

- 7.7 It is anticipated that parking will be provided at a level designed to accommodate the likely needs of the residents reflecting the likely car ownership and the pedestrian and cycle focussed layout.
- 7.8 It is proposed to provide a maximum of one space per unit for 1-and 2-bed units and a maximum of two spaces per unit for 3+bed units. This provision is considered ample to meet the needs of future residents, bearing in mind local car ownership rates, and in accordance with the Council's requirements.

Cycle parking provision

- 7.9 In order to encourage residents to cycle, parking provision at least in accordance with the standards will be provided in convenient locations with easy access from the front of houses.

Delivery and servicing

- 7.1 It is anticipated that the proposed development could generate approximately 20 service (delivery and service) vehicle trips per day (6-days/week). It is not proposed to provide any dedicated off-street facilities. Instead, all deliveries will be undertaken from the internal road network.

Refuse collection

- 7.1 Refuse vehicles will access the site via Babraham Road with refuse collected from the internal road network. The layout will be designed to accommodate a refuse vehicle.

8.3 Travel characteristics

- 3.1 It is estimated that the proposed development could generate up to 99 vehicle movements in the AM peak and 76 in the PM peak, and 239 person movements in the morning peak and 184 in the evening peak. This is based on surveys carried out at comparable sites on the outskirts of Cambridge.

8.4 Sustainable transport

- 4.1 Demand for walking and cycling in the area is high, with trips associated with the development likely to head to the Addenbrooke's Hospital area or into the city centre. Walking trips will also be made to access the public transport services at the Park and Ride site.

- 4.2 There are a number of schemes proposed by Greater Cambridge Partnership to improve cycling and public transport infrastructure, which will encourage use of sustainable travel modes. In addition, a new toucan crossing on Babraham Road is to be provided as part of the Nine Wells development.

- 4.3 As part of this development, it is proposed to:

- Improve the pedestrian provision along Worts' Causeway;
- Extend the 20mph speed limit along Worts' Causeway;
- Provide a site layout that prioritises walking and cycling; and,
- Provide good crossing facilities at the site access on Babraham Road.

8.5 Potential impact of vehicular traffic

8.5.1 As agreed with the Highway Authority, only junctions with more than 30 vehicle movements associated with the proposed development, require detailed junction capacity analysis.

Therefore, the following five junctions have been assessed in detail:

- Site access onto Babraham Road;
- Babraham Road/Granham's Road priority junction;
- Worts' Causeway/Babraham Road signalised junction;
- Addenbrooke's Hospital roundabout; and,
- Hills Road/Long Road/Queen Edith's Way signalised junction.

8.5.2 It is anticipated that 15% of traffic will head **east** along Babraham Road (10% - Babraham Road East and, 5% - Hinton Way), 75% of traffic will head **west** along Babraham Road (25% - Fendon Road/Brooks Road, 25% - Hills Road, and 25% - Long Road) and 10% will head east along Worts' Causeway during the morning peak period.

8.5.3 As agreed with the Highway Authority, the following committed developments were included in the analysis:

- Nine Wells;
- Clay Farm;
- Cambridge Biomedical Campus;
- Cambridge Biomedical Campus Phase 2; and,
- Land North of Worts' Causeway (GB1).

8.5.4 Of the four existing junctions analysed, the following is noted:

- Granham's Road/Babraham Road – operates within capacity for all future scenarios including with development with the proposed improvements. No mitigation measures required.
- Worts' Causeway/Babraham Road – operates within practical capacity, with an increase in cycle time in the PM peak. This assumes that the pedestrian phase is called every other cycle, however, on-site observations show that most pedestrians cross without calling the pedestrian phase. It also assumes that the Worts' Causeway arm is called every cycle. Improvements to this junction are possible, which will increase vehicle capacity and improve pedestrian and cyclist facilities.

- Addenbrooke's Hospital partially signalised roundabout – operates at or above capacity in the future scenario, and with the addition of traffic generated by the proposed development, the degree of saturation and queuing increases marginally. It should be noted, however, that the analysis assumes that a bus phase is called once every 90 second cycle as well as a pedestrian phase called every cycle. Improvements to the phasing and timings at this junction could provide capacity improvements, especially on the circulatory links.
- Hills Road/Long Road/Queen Edith's Way signalised junction – operates close to practical capacity in the future scenario and the addition of development traffic increases the degree of saturation and queueing marginally. It should be noted that development traffic is a very small proportion of all traffic at this junction and mitigation measures are not considered necessary.

8.6 Conclusion

- RR · The site is in a highly sustainable location, within easy walking distance of significant employment opportunities. In addition, there is easy access to the cycle routes heading into the city as well as being located on a high-quality public transport corridor. The development will be designed to provide excellent pedestrian and cyclist facilities and links to the surrounding transport network to encourage travel by sustainable modes.
- RR ? Capacity analysis of the surrounding highway network demonstrates that junctions either have sufficient capacity to accommodate the development related traffic or the impact of this traffic is minimal. Improvements have been identified to increase capacity of the highway network. Therefore, it is considered that the development can be accommodated within the surrounding transport network, in both safety and capacity terms.

9.0 REFERENCES

- Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework. London.
- Department for Communities and Local Government (2014a) National Planning Practice Guidance: Travel plans, transport assessments and statements in decision-taking. London.
- Department for Transport (2007). Manual for Streets London, DfT.
- Cambridge City Council (2018) Cambridge Local Plan 2018.
- Cambridge County Council (2014) The Transport Strategy for Cambridge and South Cambridgeshire.
- Cambridge County Council (2015) Cambridge Local Transport Plan 2011-2031.
- Cambridge County Council (2015) Cambridgeshire's Long-Term Transport Strategy.

Appendices

Appendix A - Pre-application advice with Cambridgeshire County Council (highways)

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PROJECT NOTE

Project no:	180724
Project:	Worts' Causeway – GB2
Date:	18 th March 2019
Author:	Rusne Bagdanaviciute
Subject:	Meeting notes
Attendees:	David Allatt – Cambridgeshire County Council (CCC) John Finney – CCC Tam Parry – CCC Robbie Arnold – CCC Helen Jenkins – Conisbee Rusne Bagdanaviciute – Conisbee Ewa Rams – BPTW

Item	Description	Action by:
Transport Assessment scoping		
Trip generation	The trip generation surveys were carried out at three sites in November (in very heavy rain). Site 1 had a lower trip generation rate than Sites 2 and 3. It was agreed that only Sites 2 and 3 should be used, and together with the weather, this was likely to predict a robust trip generation rate. The methodology is acceptable.	Conisbee

	Location plans showing site locations, a plan showing location of where the surveys were undertaken at each site, survey times, survey counts and data to be provided as part of the TA.	
Distribution	The use of 2011 Census data and Google maps to establish the most likely routes is acceptable.	-
Survey data	Surveys were carried out during a neutral month and a neutral day and are considered acceptable. The weather was wet and therefore agreed that surveys likely to be robust.	-
Extent of junctions	<p>DA stated that given the sensitive nature of traffic within the city, the use of percentage impact analysis at junctions is not considered appropriate. Full detailed analysis will be required for junctions with more than 30 movements (two-way). Two additional junctions will be included in the analysis – Fendon Road/Hills Road Roundabout and Hills Road/Queen Edith's Way/Long Road Signalises junction.</p> <p>Given that the development traffic at the Babraham Road/Cherry Hinton and Queen Edith's Way/Fendon Road roundabouts is fewer than 30 vehicles, it was agreed that these junctions do not require any further analysis.</p> <p>It was agreed that given that no traffic will travel via Worts' Causeway/Limekiln Road analysis of this junction is not required, this justification will be included in the TA.</p>	Conisbee
Committed developments	<p>The committed developments included (Nine Wells, Clay Farm, CBC and GB1) are considered appropriate.</p> <p>CCC to consider whether any further committed developments need to be included and provide planning application references and TAs to Consisbee.</p> <p>Separate network flow diagrams for each development should be submitted</p>	<p>CCC</p> <p>Conisbee</p>
Future year scenarios	<p>The use of year of application, development year (2024) and development year +5 years (2029) is appropriate</p> <p>The use of TEMPRO version 7.2 is acceptable</p>	-

Mitigation	If the junctions are operating above the capacity in future scenarios, potential junction mitigation to address any additional impact due to development traffic to be considered.	Conisbee
Surrounding highway network junctions	Recent works carried out at the Long Road/Hills Road/Queen Edith's Way junction to be included in the junction capacity model.	Conisbee
	Proposed improvements at Granham's Road/Babraham Road junction to be included in the junction capacity models. CCC to send CAD and pdf to Conisbee.	Conisbee/CCC
Access strategy		
Site access on Babraham Road	A signalised junction has been designed and tested for 430 houses and shown to have sufficient capacity. JF suggested that a priority junction be modelled as an alternative, which would reduce the level of infrastructure and maintenance.	Conisbee
Cycle lane	JF suggested that a cycle lane be provided through the site to Worts' Causeway. The developer's priority is to mitigate their own impact and this route is likely to be preferable to new residents heading in to Cambridge rather than using Babraham Road, and will encourage the use of more sustainable modes of travel. GCP has proposals to improve the Babraham Road cycle route, CCC stated that the needs of the development's residents should be the primary objective. Will be considered as part of the TA.	BPTW
Worts' Causeway	It was agreed that no vehicles, apart from buses, will be able to use Worts' Causeway at the restricted times. JF suggested that it may be possible to close Worts' Causeway (eastern end) to traffic. This is dependent on the wider strategy for P&R buses and would require a turning area.	CCC
Access to GB1	As required by the allocation, access to site GB1 will be provided through site GB2 and the access junction to Babraham Road. A staggered junction arrangement onto Worts' Causeway is preferred.	
Site's sustainability		

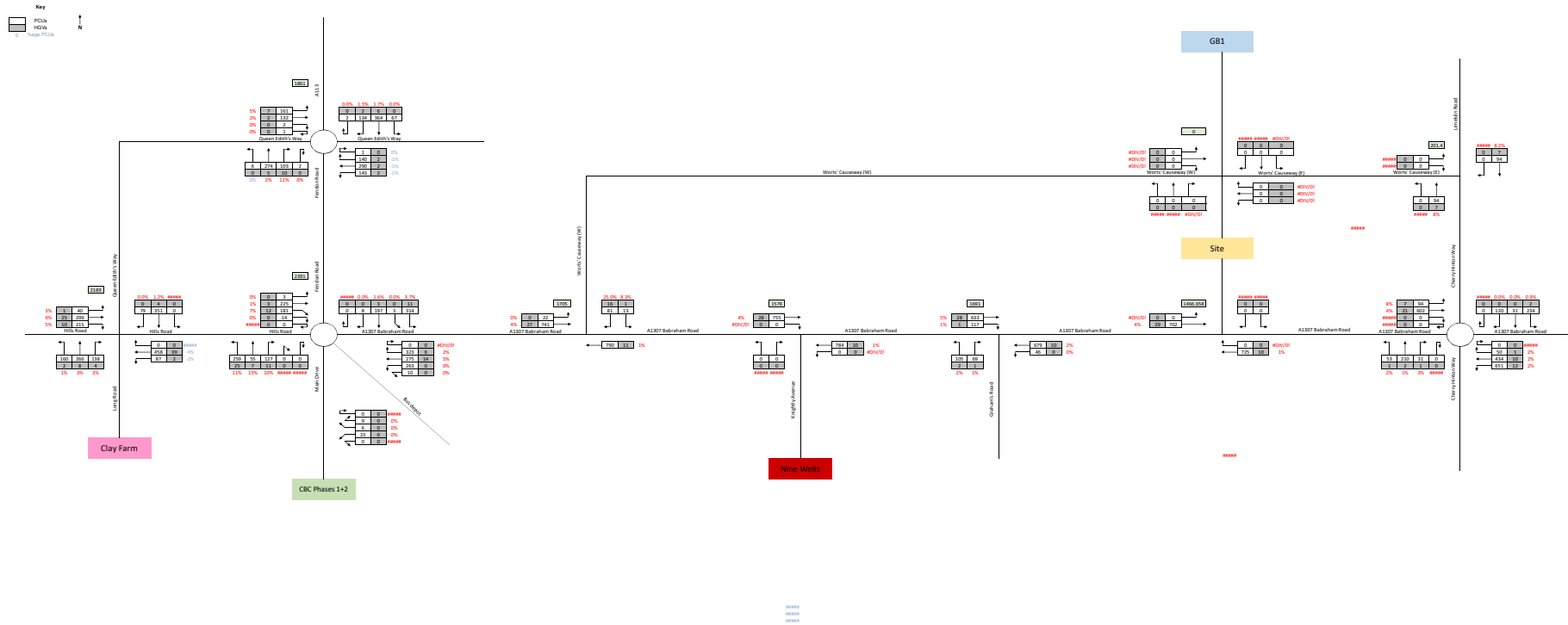
Public Transport/bus stop	<p>HJ explained that the current location of the bus stops are outside 400m walk distance. It is difficult to relocate/provide additional bus stops given that the buses use either Worts' Causeway or Babraham Road. GCP has proposals to create a high frequency public transport corridor. It is considered that residents will be prepared to walk further for good quality, direct, fast services and the additional walk distance is acceptable. Also, introducing new bus stops slows a service and reduces its attractiveness for all users.</p> <p>Bus stop infrastructure in the vicinity of the site will be reviewed as part of the TA and potential mitigation identified.</p>	Conisbee
Accident data	<p>Accident data for the last 5 years will be required. Crash Map data is not completely up to date and more recent data needs to be obtained from the council (etinfo@cambridgeshire.gov.uk) for the period between available Crash Map data period and March/April 2019.</p>	Conisbee
Access to facilities	<p>All facilities within the walking distance of 2km of the site will be identified. All facilities within the cycling distance of 5km of the site will need to be identified as clusters rather than individual facilities (e.g Cambridge City Centre, Great Shelford).</p> <p>Pedestrian/cycle infrastructure in the vicinity of the site will be reviewed as part of the TA and potential mitigation identified.</p>	Conisbee
Travel Plan (TP)		
Travel Plan	DA stated that a TP will be required as the development is over 80 units.	Conisbee
Vouchers	Either public transport or cycle vouchers will be required (with a value of £100). It was agreed that local cycle shops could be contacted for a potential discount.	Conisbee
Monitoring years	It was agreed that the TP should state that it will operate for five years and monitoring will be carried out in years initial, year 3 and final (year 5).	Conisbee

General guidance	It was agreed that clear targets and measures, likely timescales, actions, measures and details of the lead accountable person should be included in the TP.	Conisbee
Internal site layout		
Spine road	JF stated that the spine road should be 5.5m wide with 2m wide footways on both sides of the carriageway. He explained that the movement hierarchy should be pedestrians, cyclists, public transport users and car travel.	BPTW
Visitor parking	Visitor parking should be provided on the main carriageway in marked bays rather than lay-bys. JF stated that parking on the street acts as a natural speed calming measure. In addition, marked visitor bays provide flexibility and can be moved more easily to better reflect changes in visitor parking demand.	BPTW
Secondary access roads	Secondary access roads should be 5m wide	BPTW
Apartments roads	JF stated that no roads leading to apartment blocks including apartment parking areas will be adopted	
Cycle parking	Cycle parking should be prioritised and provided in convenient locations, preferably at the front of houses. JF stated that it should be easier to reach your cycle than your car. There are some examples where this has been implemented successfully – e.g. Nine Wells	BPTW
Car parking	Parking should be provided in accordance with Cambridge City's Parking Standards.	BPTW/Conisbee
Addenbrooke's parking	Parking on the adopted highway, outside of visitors bays, will be controlled to discourage parking associated with Addenbrooke's Hospital.	
Refuse vehicles	A swept-path analysis will be required for a refuse vehicle. All guidance on the size of a refuse vehicle is included in RECAP refuse collection guidance.	Conisbee

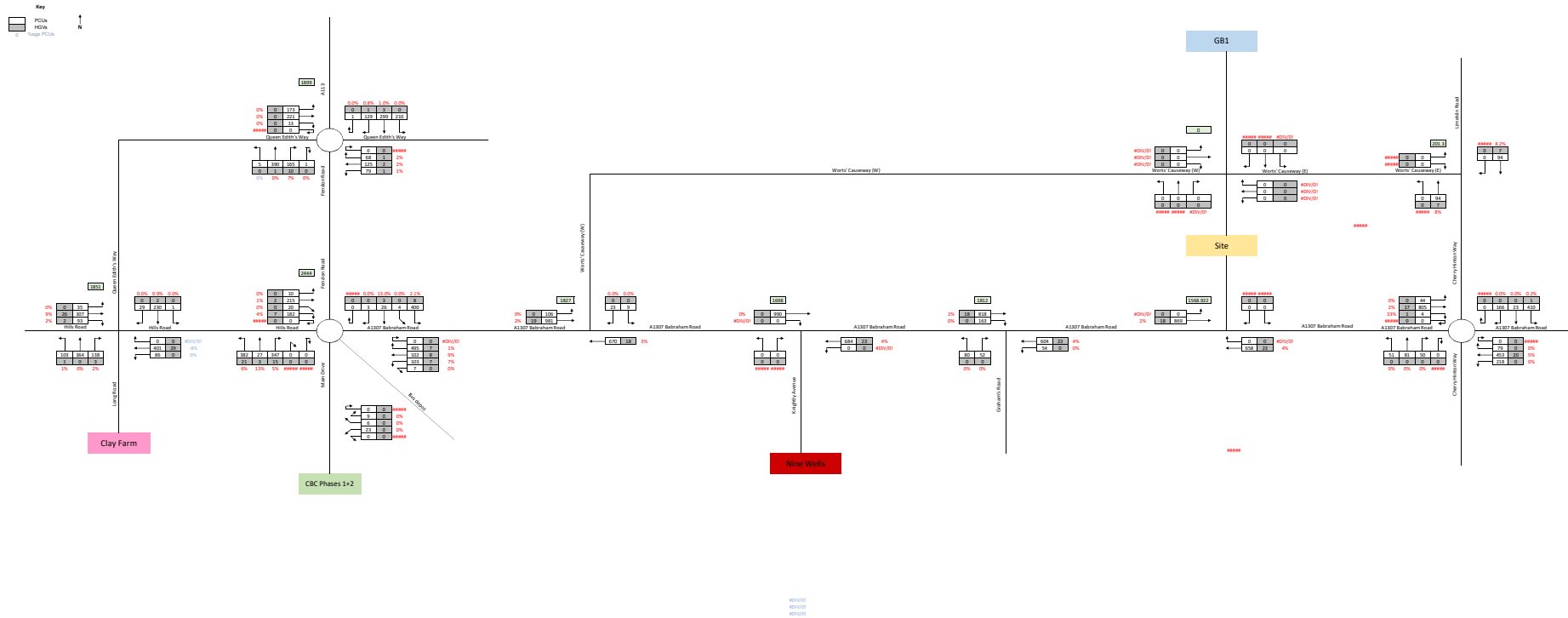
Verge	JF expressed concern about the position of the proposed verges (between carriageway and footway) related to parked cars overhanging the footway. It was suggested that either the verge and footway positions be reversed or the verge be relocated to the opposite side of the carriageway where there are no driveways.	BPTW
Other		
TA review	The developer has paid for full pre-app highways advice and therefore the next step is to submit a full draft TA including all appendices (e.g. junction capacity analysis, network flows, potential mitigation) to be reviewed by CCC prior to submission of the Planning Application.	CCC
Other	CCC requested that drawings showing junction geometries and network flow diagrams (for each scenario and committed developments) be provided; a network flow diagram showing distribution of development traffic and network flow diagrams be thoroughly checked prior to submission	Conisbee
Policy documents	<p>CCC requested that the following policy be included in the TA:</p> <ul style="list-style-type: none"> • National Planning Policy Framework • Transport Strategy for Cambridge and South Cambridgeshire • Cambridgeshire's Third Local Transport Plan (2011-2014) • Cambridgeshire's Long-term Transport Strategy 	Conisbee

Appendix B - Base 2015, 2024, 2025 flows

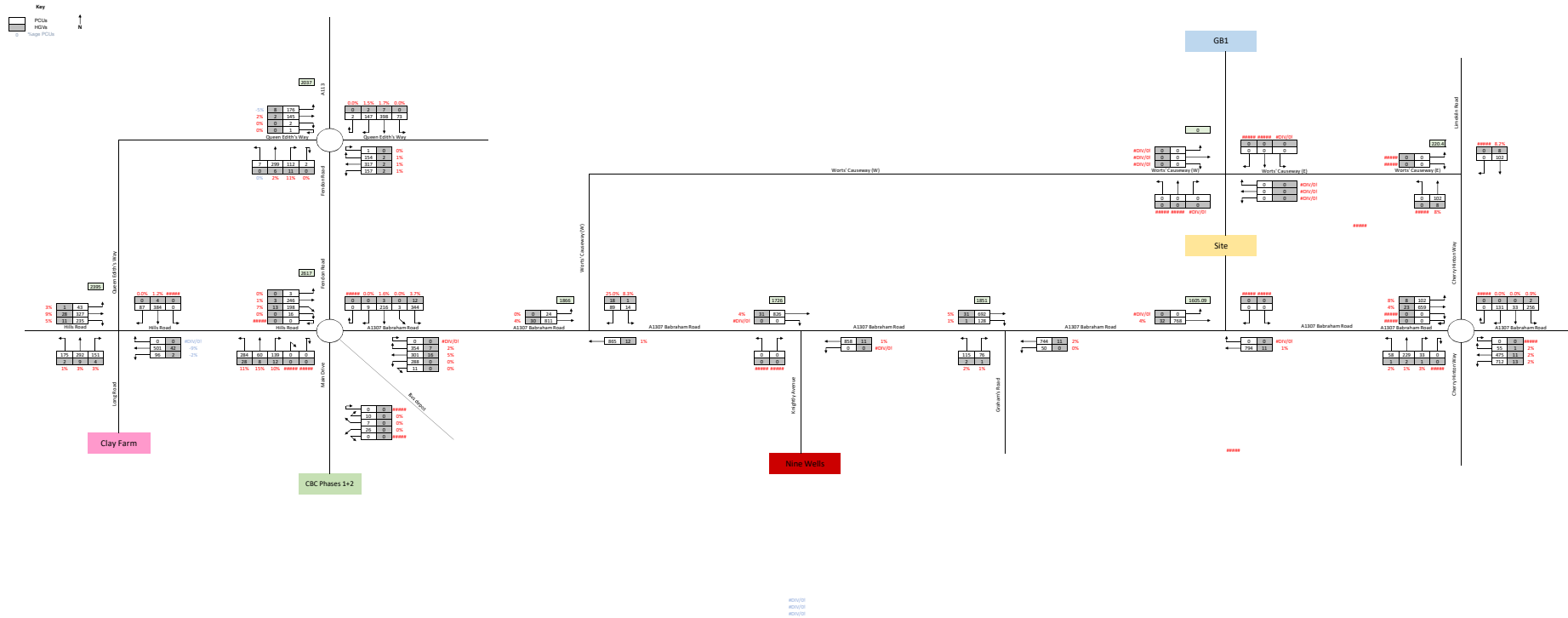
AM Base 2019



AM Base 2019

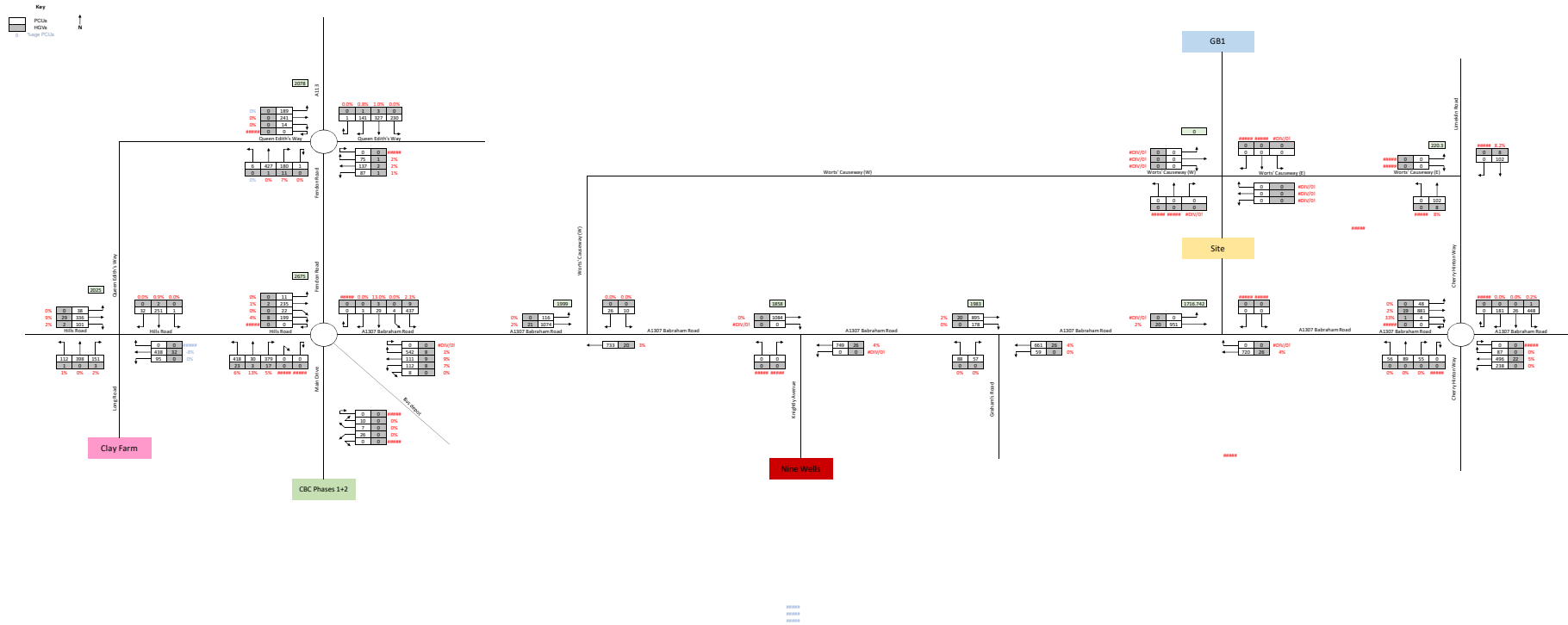


AM Base 2024



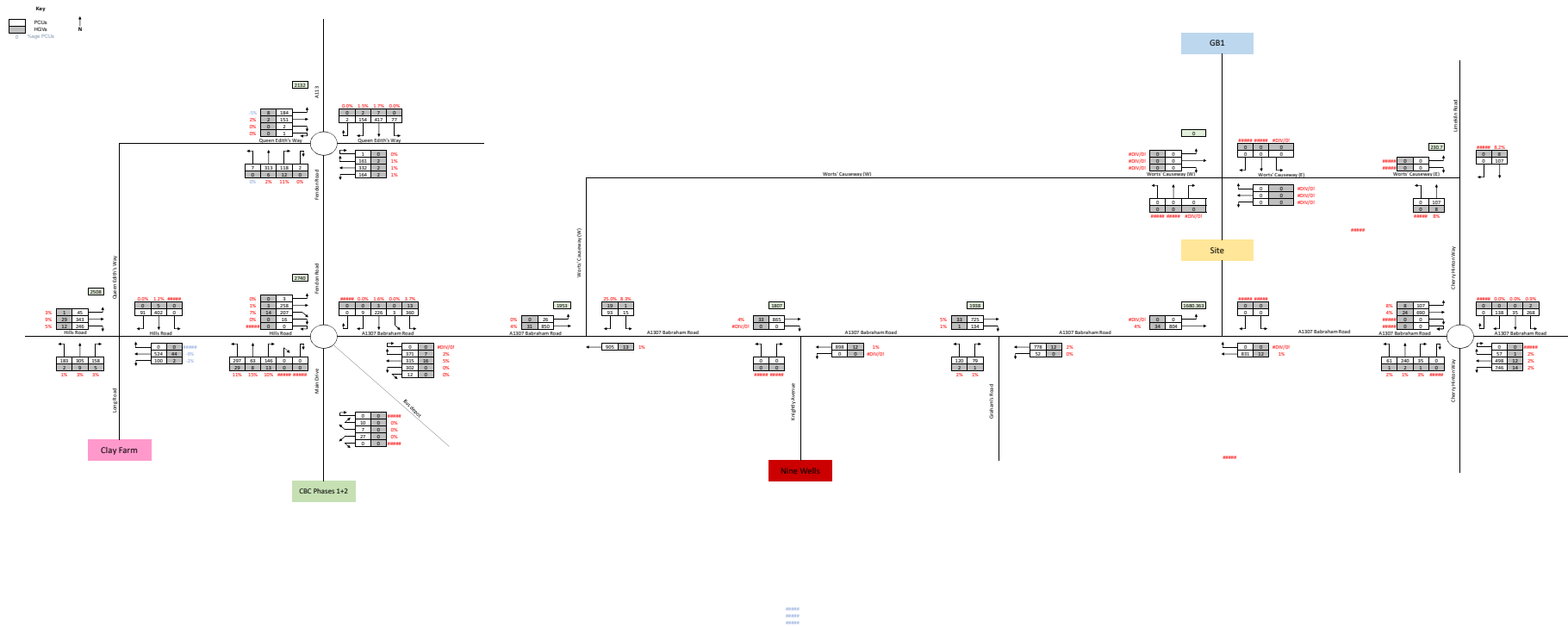
AM Base 2024

PM Base 2024



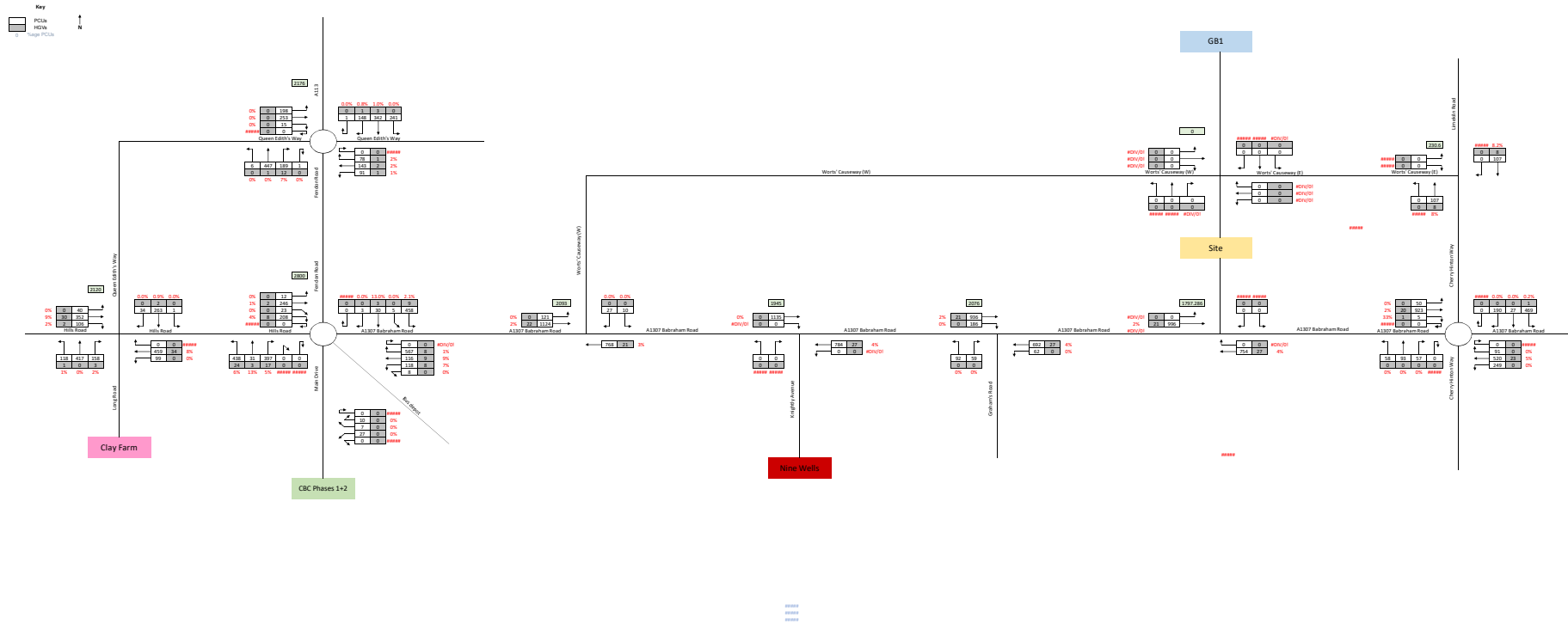
PM Base 2024

AM Base 2029



AM Base 2029

PM Base 2029



PM Base 2029

Appendix C - Survey trip rates



CLIENT:

PROJECT NUMBER: 181111

PROJECT MANAGER: ADAM CARTER

DATE: WEDS 28TH NOV 2018

PROJECT DESCRIPTION: CAMBRIDGE ACCESS - SITE 1 - SITE PLAN



		A								B							
		CAR	LGV	OGV 1	OGV 2	PSV	M/C	CYCLE	PEDS	CAR	LGV	OGV 1	OGV 2	PSV	M/C	CYCLE	PEDS
07:00	07:15	0	1	0	0	0	0	0	0	2	1	0	0	0	0	0	0
07:15	07:30	1	0	0	0	0	0	0	0	4	0	0	0	0	0	1	1
07:30	07:45	2	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0
07:45	08:00	1	2	0	0	0	0	0	0	4	0	0	0	0	0	1	0
TOTAL		4	4	0	0	0	0	0	0	14	1	0	0	0	0	2	1
08:00	08:15	1	0	0	0	0	0	0	0	7	0	0	0	0	0	1	0
08:15	08:30	2	3	0	0	0	0	0	0	2	2	0	0	0	0	1	1
08:30	08:45	0	1	0	0	0	0	0	0	9	0	0	0	0	0	0	0
08:45	09:00	1	0	0	0	0	0	0	1	5	1	0	0	0	0	4	2
TOTAL		4	4	0	0	0	0	0	1	23	3	0	0	0	0	6	3
09:00	09:15	2	1	0	0	0	0	0	1	4	0	0	0	0	0	2	0
09:15	09:30	0	0	0	0	0	0	0	0	4	0	0	0	0	0	2	1
09:30	09:45	3	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
09:45	10:00	2	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0
TOTAL		7	1	0	0	0	0	0	1	15	1	0	0	0	0	4	1
PERIOD TOTAL		15	9	0	0	0	0	0	2	52	5	0	0	0	0	12	5
15:00	15:15	2	3	0	0	0	0	0	0	3	0	0	0	0	0	0	1
15:15	15:30	2	0	0	0	0	0	1	0	5	1	0	0	0	0	0	0
15:30	15:45	4	0	0	0	0	0	1	0	2	2	0	0	0	0	0	0
15:45	16:00	3	1	0	0	0	0	0	0	3	0	0	0	0	0	0	0
TOTAL		11	4	0	0	0	0	2	0	13	3	0	0	0	0	0	1
16:00	16:15	2	1	0	0	1	0	0	0	2	2	0	0	1	0	0	0
16:15	16:30	2	1	1	0	0	0	0	0	1	2	1	0	0	0	0	0
16:30	16:45	2	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
16:45	17:00	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
TOTAL		10	2	1	0	1	0	1	0	5	4	1	0	1	0	0	0
17:00	17:15	2	0	0	0	0	0	2	1	1	0	0	0	0	0	0	1
17:15	17:30	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0	1
17:30	17:45	7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
17:45	18:00	3	0	0	0	0	0	1	3	3	0	0	0	0	0	1	1
TOTAL		14	0	0	0	0	0	3	4	8	0	0	0	0	0	1	3
18:00	18:15	5	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0
18:15	18:30	3	0	0	0	0	0	3	2	0	0	0	0	0	0	0	3
18:30	18:45	5	0	0	0	0	0	1	1	1	0	0	0	0	0	2	1
TOTAL		13	0	0	0	0	0	5	3	3	0	0	0	0	0	2	4
PERIOD TOTAL		35	6	1	0	1	0	6	4	26	7	1	0	1	0	1	4
DAILY TOTAL		50	15	1	0	1	0	6	6	78	12	1	0	1	0	13	9
GRAND TOTAL		73								101							

	a								b								PEDS
	CAR	LGV	OGV 1	OGV 2	PSV	M/C	CYCLE	PEDS	CAR	CAR	LGV	OGV 1	OGV 2	PSV	M/C	CYCLE	
07:00	4	4	0	0	0	0	0	0	0	14	1	0	0	0	0	2	1
07:15	5	3	0	0	0	0	0	0	0	19	0	0	0	0	0	3	1
07:30	6	6	0	0	0	0	0	0	0	17	2	0	0	0	0	3	1
07:45	4	6	0	0	0	0	0	0	0	22	2	0	0	0	0	3	1
08:00	4	4	0	0	0	0	0	1	0	23	3	0	0	0	0	6	3
08:15	5	5	0	0	0	0	0	2	0	20	3	0	0	0	0	7	3
08:30	3	2	0	0	0	0	0	2	0	22	1	0	0	0	0	8	3
08:45	6	1	0	0	0	0	0	2	0	17	1	0	0	0	0	8	3
09:00	7	1	0	0	0	0	0	1	0	15	1	0	0	0	0	4	1
09:15	5	0	0	0	0	0	0	0	0	11	1	0	0	0	0	2	1
09:30	7	3	0	0	0	0	0	0	0	10	1	0	0	0	0	0	1
09:45	6	3	0	0	0	0	1	0	0	11	2	0	0	0	0	0	1
15:00	11	4	0	0	0	0	2	0	0	13	3	0	0	0	0	0	1
15:15	11	2	0	0	1	0	2	0	0	12	5	0	0	1	0	0	0
15:30	11	3	1	0	1	0	1	0	0	8	6	1	0	1	0	0	0
15:45	9	3	1	0	1	0	1	0	0	7	4	1	0	1	0	0	0
16:00	10	2	1	0	1	0	1	0	0	5	4	1	0	1	0	0	0
16:15	10	1	1	0	0	0	3	1	0	4	2	1	0	0	0	0	1
16:30	10	0	0	0	0	0	3	1	0	6	0	0	0	0	0	0	2
16:45	15	0	0	0	0	0	2	1	0	6	0	0	0	0	0	0	2
17:00	14	0	0	0	0	0	3	4	0	8	0	0	0	0	0	1	3
17:15	17	0	0	0	0	0	2	3	0	9	0	0	0	0	0	1	2
17:30	18	0	0	0	0	0	5	5	0	6	0	0	0	0	0	1	4
17:45	16	0	0	0	0	0	6	6	0	6	0	0	0	0	0	3	5

Vehicles

	arr	dep
18	4	14
24	5	19
23	6	17
26	4	22

27 4 23

25	5	20
25	3	22
23	6	17
22	7	15
16	5	11
17	7	10
17	6	11

24	11	13
23	11	12
19	11	8
16	9	7

15	10	5
14	10	4
16	10	6
21	15	6

22 14 8

26	17	9
24	18	6
22	16	6

208 units

	Arr	Dep	Total
AM	0.024	0.096	0.120
PM	0.067	0.038	0.106

SITE PLAN



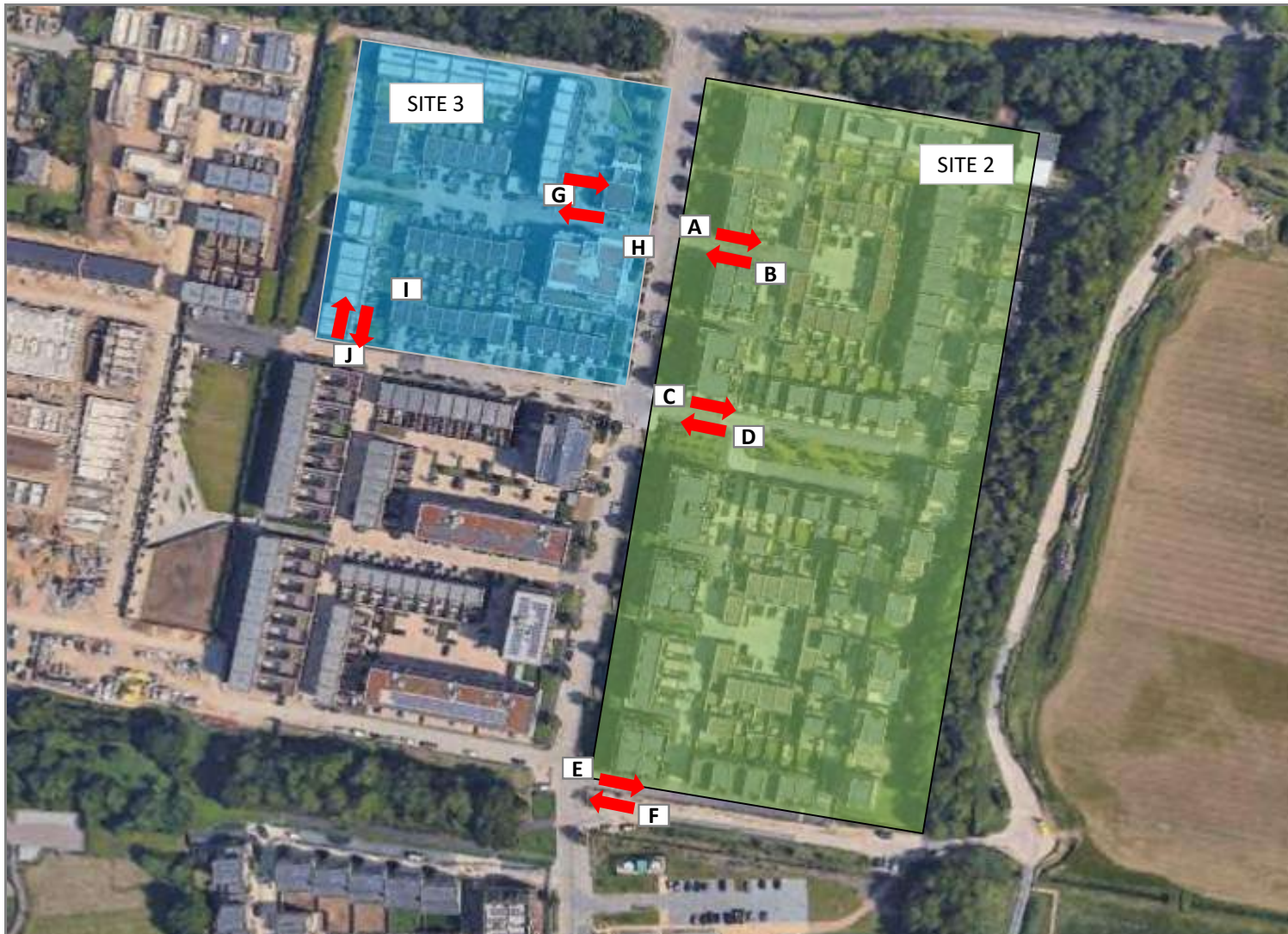
CLIENT:

PROJECT NUMBER: 181111

PROJECT MANAGER:

DATE: WEDS 28TH NOV 2018

PROJECT DESCRIPTION: CAMBRIDGE ACCESS - SITE 2 & 3 - SITE PLAN



PROJECT NUMBER: 181111

DATE: WEDS 28TH NOV 2018

PROJECT DESCRIPTION: CAMBRIDGE - ACCESS - SITE 2

		A In								B Out								C In								D out								E In								F out									
		CAR	LGV	OGV	1 OGV ²	PSV	M/C	CYCLE	PEDS	CAR	LGV	OGV	1 OGV ²	PSV	M/C	CYCLE	PEDS	CAR	LGV	OGV	1 OGV ²	PSV	M/C	CYCLE	PEDS	CAR	LGV	OGV	1 OGV ²	PSV	M/C	CYCLE	PEDS	CAR	LGV	OGV	1 OGV ²	PSV	M/C	CYCLE	PEDS	CAR	LGV	OGV	1 OGV ²	PSV	M/C	CYCLE	PEDS		
07:00:	07:15:	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1		
07:15:	07:30:	0	1	0	0	0	0	0	1	4	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	1	3	1	0	0	0	1	0	0	0	0	0	0	0	1	3	1	0	0	0	0	1	0			
07:30:	07:45:	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1				
07:45:	08:00:	1	0	0	0	0	0	0	0	3	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0			
TOTAL		3	1	0	0	0	0	0	1	9	2	0	0	0	0	3	1	3	0	0	0	0	0	0	0	2	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	2		
08:00:	08:15:	1	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	10	0	0	0	0	0	0	0	2	0	0	0	0	2	1	4	0	0	0	0	0	0			
08:15:	08:30:	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0			
08:30:	08:45:	0	1	0	0	0	0	0	0	5	1	0	0	0	0	0	2	1	3	0	0	0	0	0	1	1	3	0	0	0	0	0	1	3	2	1	0	0	0	0	1	2	0	0	0	0	5	4			
08:45:	09:00:	1	0	0	0	0	0	0	0	4	1	0	0	0	0	0	1	3	3	0	0	0	0	0	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0		
TOTAL		3	1	0	0	0	0	0	0	15	3	0	0	0	0	2	2	10	4	0	0	0	0	0	2	3	25	1	0	0	0	0	0	3	5	4	3	0	0	0	0	2	2	12	2	0	0	0	9	8	
09:00:	09:15:	8	6	1	0	0	0	2	1	7	7	0	0	0	0	3	1	2	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	1	0	0	0	0	2	1	1	0	0	0	0	1	0		
09:15:	09:30:	5	2	0	0	0	0	1	0	4	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	1	0	2	1	1	0	0	0	1	0	0	0	0	0	1	0			
09:30:	09:45:	1	3	0	0	0	0	1	0	4	3	0	0	0	0	1	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
09:45:	10:00:	2	0	0	0	0	2	0	0	3	2	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0	2	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0		
TOTAL		17	13	1	0	0	0	1	0	18	12	0	0	0	0	2	2	7	0	0	0	0	0	0	0	1	7	1	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0		
PERIOD TOTAL		23	15	1	0	0	0	6	2	42	12	0	0	0	0	12	5	18	6	0	0	0	0	0	0	3	6	38	4	0	0	0	1	12	10	11	4	1	0	0	0	5	5	29	3	0	0	1	16	12	
15:00:	15:15:	7	1	0	0	0	0	1	0	6	2	0	0	0	0	0	0	3	1	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
15:15:	15:30:	3	0	0	0	0	0	4	1	5	6	0	0	0	0	0	0	1	2	0	0	0	0	0	3	6	4	1	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0			
15:30:	15:45:	3	1	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	3	0	0	0	0	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
15:45:	16:00:	2	0	0	0	0	0	6	0	6	1	0	0	0	0	2	0	5	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3		
TOTAL		15	2	0	0	0	0	11	1	20	10	0	0	0	0	2	0	12	3	0	0	0	0	0	6	6	15	1	0	0	0	0	0	1	11	1	0	0	0	0	0	4	7	8	1	0	0	0	0	2	4
16:00:	16:15:	6	0	0	0	0	0	5	2	1	3	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		
16:15:	16:30:	0	1	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	3	1	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
16:30:	16:45:	2	0	0	0	0	0	3	2	2	0	0	0	0	0	0	0	4	0	0	0	0	0	0	1	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
16:45:	17:00:	1	0	0	0	0	2	1	0	2	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
TOTAL		9	0	0	0	0	0	4	8	5	0	0	0	0	0	1	0	10	0	0	0	0	0	0	0	5	2	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5		
17:00:	17:15:	8	0	0	0	0	1	0	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
17:15:	17:30:	7	1	0	0	0	0	2	1	6	1	0	0	0	0	0	0	0	2	0	0	0	0	0	3	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0			
17:30:	17:45:	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
17:45:	18:00:	3	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
TOTAL		22	1	0	0	0	0	4	1	16	3	0	0	0	0	0	3	2	6	0	0	0	0	0	0	6	1	4	0	0	0	0	0	1	3	4	2	0	0	0	0	1	0	4	1	0	0	0	0		
18:00:	18:15:	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0			
18:15:	18:30:	4	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	3	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0			
18:30:	18:45:	4	0	0	0	0	0	1	1	2	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
TOTAL		46	4	0	0	0	0	24	6	44	18	0	0	0	0	0	6	2	28	5	0	0	0	0	0	14	12	27	3	0	0	0	0	3	4	22	3	0	0	0	0	8	10	15	2	1	0	0	0	2	9
DAILY TOTAL		69	19	1	0	0	0	30	8	86	30	0	0	0	0	0	18	7	46	11	0	0	0	0	17	18	65	7	0	0	0	0	1	15	14	33	7	1	0	0	0	13	15	44	5	1	0	0	1	18	21
GRAND TOTAL		97										123												75								87										56						72			