HighgateTransportation

Proposed Development at Peel Hall, Warrington

Transport Assessment

(HTp/1107/TA/01/A)

January 2018

LPA Ref: 2016/28492

Pins Ref: APP/M0655/W/17/3178530

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1.0 Introduction

1.1 Highgate Transportation Limited (HTp) have been commissioned by Satnam Millennium Limited to provide transportation advice in support of the proposals for a new residential neighbourhood on land at Peel Hall in Warrington. The outline application, with all matters reserved except for means of access, was submitted in July 2016 and validated in August 2016 (local planning authority reference: 2016/28492).

1.2 The officer's committee report in February 2017 was supportive of the scheme and highlighted that the development of this site was, "*…undoubtedly capable of bringing significant potential benefits as a sustainable urban extension to the northern edge of Warrington without intruding into Green Belt*".

1.3 The application was recommended for refusal by officers due to lack of information regarding highways and also concerning the contents of the Section 106 Agreement. It was considered at committee in February 2017 where it was refused (see committee report in **Appendix 1** and decision notice included as **Appendix 2**). A planning appeal was submitted in June 2017 against the reasons for refusal and the appeal reference is APP/M0655/W/17/3178530.

1.4 The description of the planning application is:

"Outline application for a new residential neighbourhood including C2 and C3 uses; local employment (B1 uses); local centre including food store up to 2,000m^2, A1-A5 (inclusive) and D1 use class units of up to 600m^2 total (with no single unit of more than 200m^2) and family restaurant/pub of up to 800m^2 (A3/A4 use); site for primary school; open space including sports pitches with ancilary facilities; means of access and supporting infrastructure at Peel Hall, Warrington."

1.5 For the purposes of this transport assessment the development is assumed to comprise up to 1,200 residential dwellings, an area of employment, a local centre with food store, a care home, a two-form entry primary school and the relocation and upgrading of existing sports pitches with ancillary facilities. The assessment includes consideration of the on-site highway and access requirements, all modes of transport and the demands placed on the local and wider highway network.

1.6 This Transport Assessment (HTp/1107/TA/01/A) supersedes the Transport Assessment (TA/01) that supported the planning application in 2016; TA/01/A is the updated report that reflects the progress made with the area-wide transport modelling and subsequent mitigation proposals.

1.7 Discussions were held with Warrington Borough Council's (WBC) highway officers and Highways England (HE) at an early stage to scope out the assessment. The study area was agreed in January 2016 and updated in September 2016 at the request of WBC officers; and this is illustrated on the plan contained in **Appendix 3**.

1.8 Notes from meetings held with WBC and HE are contained in **Appendix 4**, and WBC's highways consultation response dated 5th December 2016 is contained in **Appendix 5**, accompanied by HTp's response.

1.9 Extensive discussions have also been held with Network Warrington concerning how to best serve the development by bus. This is set out in more detail in **Section 6.0**.

1.10 The guiding principles in the development of the scheme have been to encourage the use of sustainable modes of transport and to contain trips within the development as far as possible. This is achieved by the mixed-use nature of the development and high level of permeability and connectivity throughout the site. Another guiding principle has been the need to protect the existing residential area to the south of the site from development traffic.

1.11 As part of the development proposals, mitigation measures have been identified in the form of a new comprehensive and attractive bus service that will connect the site with the town centre in the south and Birchwood to the east, and a range of engineering measures at local junctions. The development will also be supported by extensive Travel Plan measures.

1.12 The proposed new high quality bus service will provide a genuine modal choice for the future residents of the Peel Hall site, creating a link not only to the wider area for employment, retail and leisure but also across the site; supported by an excellent network of pedestrian and cycle routes throughout the development that will also link into the wider area.

1.13 The work carried out since the 5th December 2016 WBC highways consultation response includes for an assessment of the option for creating a through route across the site between the A49 in the west and Blackbrook Avenue in the east, as requested by the Council's highway officers.

1.14 Therefore, there are two access strategy options for consideration:

i. The non-through route access strategy, with the development served off five separate access points including a new roundabout from Mill Lane in the east. This is the strategy that was proposed with the planning application and is referred to as Option A.
ii. The through route access strategy that connects the proposed new roundabout junction on Mill Lane with the A49 in the west via a new signalised junction on Poplars Avenue. This strategy is referred to as Option B.

1.15 In Option A, it is proposed that the main vehicular accesses to the development will be provided from a new roundabout access on Mill Lane north of the Blackbrook Avenue/Ballater Drive/Mill Lane/Enfield Park Road roundabout junction, with a secondary access from Poplars Avenue located between Newhaven Road and Windermere Avenue. Additional access is provided from a second access from Mill Lane, one from Birch Avenue and a second access on Poplars Avenue to serve the employment area. Access to the sports pitches will be from Grasmere Avenue. The Option A Parameters Plan forms **Appendix 6**.

1.16 In Option B, it is proposed that the main vehicular accesses to the development will be provided from the proposed new roundabout access on Mill Lane north of the Blackbrook Avenue/Ballater Drive/Mill Lane/Enfield Park Road roundabout junction, linking through to the A49 with a new signalised junction at the existing Poplars Avenue junction. This access strategy requires the relocation of the existing stopped-up section of Poplars Avenue. The Parameters Plan for Option B forms **Appendix 7**.

1.17 Reference will be made to the planning inquiry (Pins ref: APP/M0655/A/13/2192076) held in 2013 that considered the proposals for 150 dwellings to be accessed via Mill Lane and to enhance the sports pitches and clubhouse adjacent to Grasmere Avenue. This appeal was rejected on the grounds that the development was too far from local services and facilities and that there was no need for additional housing to be released at that time. It is appropriate to note that despite the highways officer's objection to the suitability of the proposed access arrangements, the inspector concluded that in highway terms, up to 150 dwellings could be accessed via Mill Lane.

1.18 The methodology used in the Transport Assessment generally follows the guidelines set out in the Guidance on Transport Assessment published by the Department for Transport (DfT) and the Department for Communities and Local Government (DCLG). The methodology used includes:

i. Identifying the local transport network and assessing the existing transport conditions.
ii. Identifying local services and amenities.
iii. An assessment of the transport related planning policies and guidelines and identifying the impact issues.
iv. Setting out the development proposals and proposed phasing.
v. Identifying what sustainable travel measures can be introduced including through Travel Plan initiatives.
vi. An appraisal of the impact of the proposed development on safety and accessibility.
vii. An appraisal of the impact from construction vehicles.
viii. Determining the development trip rates and the distribution and assignment of trips.
ix. Identifying the assessment years and the analysis periods.
x. An assessment of the transport impact.
xi. Identifying supporting mitigation measures and the S106 heads for agreement.

1.19 WBC and HE requested in 2016 that the assessment for Peel Hall was to follow what had been agreed for the Omega South (Zones 3-6) planning application (ref: 2015/26469).

1.20 As part of the assessment process it was agreed to expand the existing VISSIM micro simulation model that covers parts of the M62 and A49 corridors, which was originally developed by AECOM on behalf of HE. AECOM were engaged to carry out this work and also provided a distribution model that made use of the WBC VISUM matrix following agreement with officers at WBC.

1.21 VISSIM is frequently used to model large networks and the benefit of this modelling tool is that each entity (car, bus, etc.) is simulated individually, which provides a helpful visual analysis of the network. This is the approach taken by the Omega application.

1.22 VISUM software is used for traffic analysis forecasting and GIS-based data management, to model road users and their interactions.

1.23 It became increasingly apparent that the VISSIM program could not adequately cope with the data, not least due to the number of route choices available on the Peel Hall network. It was therefore agreed in early 2017 that an approach using SATURN would be the most acceptable way forward in order to extract flow data for detailed modelling of individual junctions. SATURN is a software package used for undertaking traffic analysis on large and/or congested highway networks.

1.24 The sections of this report can be summarised as follows:

Section 2.0 – A review of the existing transport network and base data.

Section 3.0 – A summary of transport policy and guidance used to inform the development of the Parameters Plans, illustrative masterplans and mitigation proposals.

Section 4.0 – The development proposals, including a description of the pedestrian, cycle and public transport accessibility, travel plan measures, internal road hierarchy and constraints.

Section 5.0 – This section sets out the two access strategies (Option A and Option B), including the detailed access arrangements and Road Safety Audits.

Section 6.0 – A description of the proposed bus measures.

Section 7.0 – A review of proposed highways phasing of development and construction traffic.

Section 8.0 – This section sets out the development trip generation and attraction figures that have been agreed during 2016 and 2017.

Section 9.0 – This section sets out the development trip distribution that has been agreed during 2016 and into 2017.

Section 10.0 – A review of background traffic growth.

Section 11.0 – A description of the agreed committed developments.

Section 12.0 – A summary of the SATURN modelling and results (base year and future years of 2025 and 2030, plus 2030 through route scenario), referencing the LMVR and Forecasting Report.

Section 13.0 – A summary of the site access junction capacity assessments.

Section 14.0 – A summary of the off-site junction capacity assessments.

Section 15.0 – This section sets out the proposed mitigation works.

Section 16.0 – A summary of the highway-related Section 106 heads of terms.

1.25 This Transport Assessment is supported by an umbrella Framework Travel Plan (HTp/1107/FTP/01) to cover all proposed land uses. It is anticipated that individual Travel Plans for the different phases and land uses will be conditioned as part of a future consent and that these documents will reference the Framework Travel Plan and any subsequently agreed requirements from WBC.

1.26 The approach in this Transport Assessment is the approach that was agreed at the HE/WBC scoping meeting in January 2016. The main assessment parameters and approach taken was to mirror the Omega application process, as requested by WBC and HE. If anything, the trip rates used are more robust (see **Section 8.0**).

1.27 Officers had been advised during the VISSIM review process that their comments on the first part of the Transport Assessment would be covered within the next iteration of the Transport Assessment, and that generally the comments would either be allowed for or be superseded by subsequent work.

1.28 Accessibility and opportunities to travel by sustainable modes are key factors for good development. The Peel Hall site with its mixed-use development profile and proposed new bus service will afford, not just future residents of the site but also local residents with this area of Warrington, a comprehensive modal choice and as such encourage and enable sustainable travel to occur.

1.29 A full accident review has been carried out and all road users considered in this assessment. Two independent Stage 1 Road Safety Audits have been carried out and the recommendations generally accepted, or where otherwise the design supported with additional information.

1.30 The local and wider highway network has been modelled in SATURN with further standalone junction analysis where the SATURN modelling showed:

i. An increase in RFC of 5% or more for a Do Something scenario above a Do Minimum scenario RFC of 85% or more.
ii. An increase in RFC of 3% or more for a Do Something scenario above a DO Minimum scenario RFC of 90% or more.
iii. Where queue lengths are shown to increase in Do Something scenario beyond that of current stacking capacity on the existing network.
iv. Where junctions are shown to have a capacity of 85% or above in the Do Something scenario compared to results below 85% in the Do Minimum.

1.31 The highway works mitigation measures proposed have generally resulted in junction operational levels being reduced to Do Minimum results, therefore it is considered that the transport impact of the Peel Hall site cannot be considered severe with the proposed measures. Furthermore, the Travel Plan measures combined with the comprehensive and attractive new bus service will further reduce the impact of the development site on the local and wider highway network and encourage a genuine choice of sustainable travel modes.

1.32 This report concludes that the proposals represent sustainable development in transport terms, and that in accordance with Paragraph 32 of the National Planning Policy Framework (NPPF) improvements can be undertaken within the transport network that effectively limit the significance of impact arising from the development of the Peel Hall site.

1.33 This Transport Assessment finally concludes that the proposed development at Peel Hall is acceptable in highway and transport terms.

2.0 Existing Transport Network

Existing Highway Network - Description

2.1 The site is located on the northern edge of Warrington, adjacent to the existing residential areas of Hulme, Blackbrook, Cinnamon Brow and Houghton Green. It is bound by the M62 to the north, Mill Lane to the east, Poplars Avenue to the south and Birch Avenue and Elm Road to the west. The location of the site and wider highway network are shown in the plan of the study area that forms **Appendix 3** and the existing Peel Hall site and the local highway network are shown in the plan that forms **Appendix 8**.

2.2 Access to these residential areas is generally from:

i. Junction 9 of the M62 to the north-west. This operates as a large signalised gyratory junction with the A49. To the north the A49 comprises Newton Road and the Winwick Link Road which acts as a bypass for Winwick, and leads to junction 22 of the M6 to the north. To the south is Winwick Road.
ii. The Winwick Road (A49) corridor to the west. This is a major radial road and links the centre of Warrington with junction 9 of the M62. It is mostly dual carriageway and is a major bus route. In the context of Peel Hall, the major junctions along Winwick Road that provide access to the application site area are at Sandy Lane West and at Long Lane (A50).
iii. The A50 connects the area to the west of the A49 with junction 20 of the M6 to the south.
iv. The Delph Lane/Mill Lane/Blackbrook Avenue corridor to the east. This north-south corridor acts as a major distributor road and is a bus route. It also leads to Winwick via Myddleton Lane and junction 22 of the M6 to the north via Southworth Lane.

2.3 Access to the Peel Hall area from the A49 is mainly via the signalised roundabout junction with Sandy Lane West and then via Cleveland Road to Poplars Avenue and Capesthorne Road.

2.4 Access from the A49 to the Peel Hall area can also be gained from the signalised junction with Long Lane. Access to this area from the A50/A574 corridor is mainly from Long Lane via Northway, Statham Avenue or Hawson Road to Poplars Avenue; from Orford Green via its junction with Birtles Road and then Capesthorne Road to Poplars Avenue; from Orford Green via its junction with Poplars Avenue; from the roundabout junction of Orford Green and Orford Road which provides access via Hilden Road to Blackbrook Avenue; and from Birchwood Way via its roundabout junction with Blackbrook Avenue.

2.5 Birch Avenue also has a junction with the A49 just to the south of Junction 9 of the M62. Birch Avenue is a residential access road and, combined with Elm Road, serves around 50 dwellings and a NHS unit for children and adolescents. These roads essentially form a cul-de-sac from Winwick Road.

2.6 Access to the Peel Hall area from the Delph Lane/Mill Lane/Blackbrook Avenue corridor is mainly via the Blackbrook Avenue/Capesthorne Road/Enfield Park Drive roundabout junction.

2.7 Just to the north of the Blackbrook Avenue/Ballater Drive/Mill Lane/Enfield Park Road roundabout junction, Mill Lane forms a priority junction with Delph Lane. From this junction Mill Lane and Radley Lane provide access directly to the site. Radley Lane is part residential access road and part country lane in character to the south and to the north is a narrow country lane that forms Public Right of Way (PRoW) number 2. Public Rights of Way and pedestrian access in the vicinity of the site are considered in more detail in **paragraphs 2.60** to **2.63** and **2.71** to **2.73**.

2.8 The main local distributor roads through the existing residential area to the south of the site are Sandy Lane West, Sandy Lane, Cleveland Road, Howson Road, Statham Avenue, Poplars Avenue, Greenwood Crescent and Capesthorne Road. These are generally single carriageway roads and are mostly residential in character. Statham Avenue, Poplars Avenue and Greenwood Crescent to the south together with Northway, Sandy Lane and Cotswold Road to the west and Blackbrook Avenue and Enfield Park Road to the east provide the bus routes that serve the local area.

2.9 On Poplars Avenue there is an existing stopping up between Cotswold Road and Lancing Avenue (see **Figures 2.1** and **2.2** below) and that this has the effect of reducing the capacity onto the A49 corridor, forcing A49 bound traffic to the north or south of the Peel Hall area. The photograph below was taken from Cotswold Road where it joins Poplars Avenue, and shows the area that has been stopped-up.

Photograph 2.1 – Stopped-up section of Poplars Avenue

2.10 The routes listed in **paragraph 2.8** and the stopped-up section of Poplars Avenue are shown in **Figure 2.1** below and on the plan contained in **Appendix 8**. A close-up of the stopped-up section is also shown on **Figure 2.2**.

Figure 2.1 – Local highway network extract

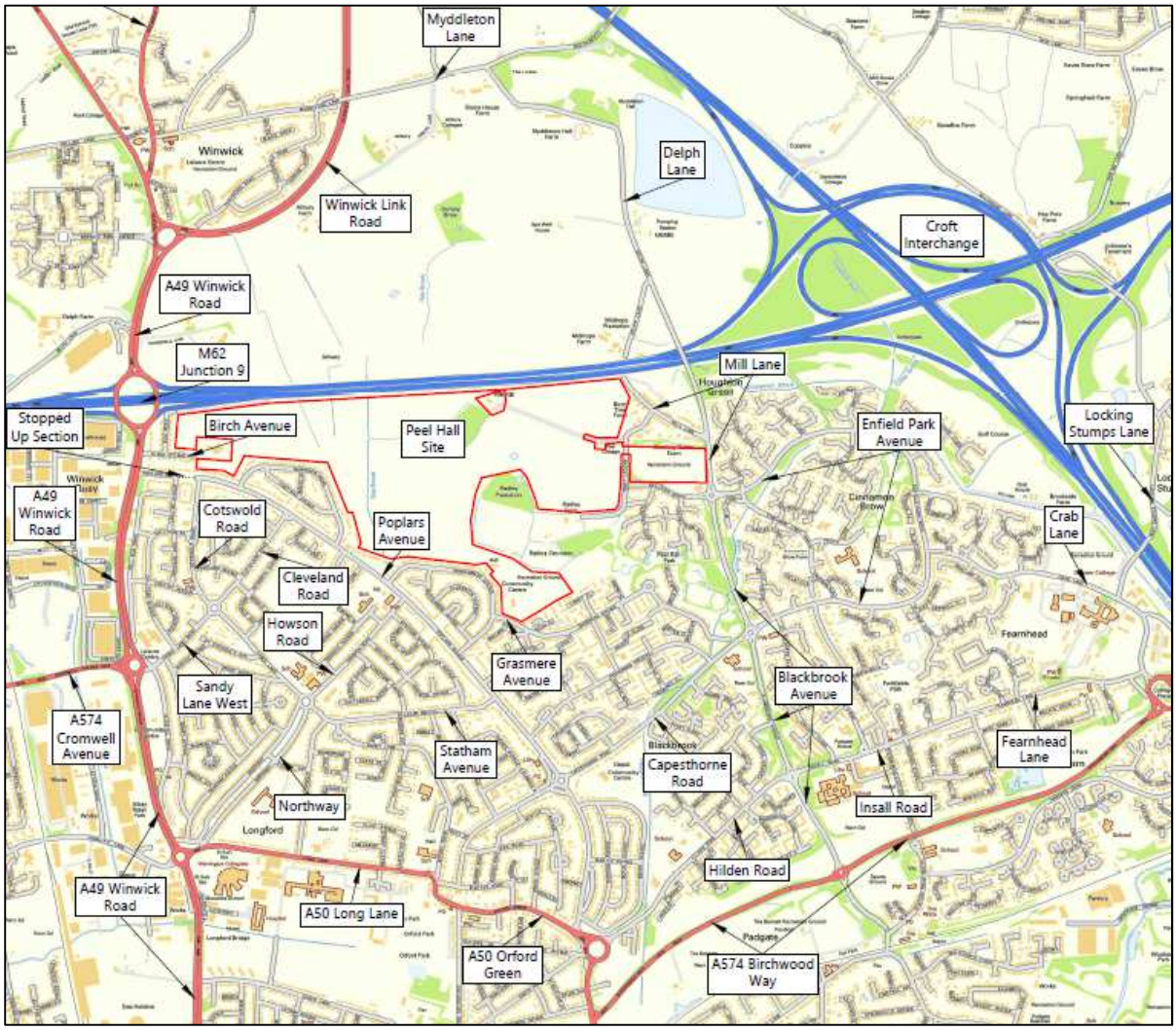
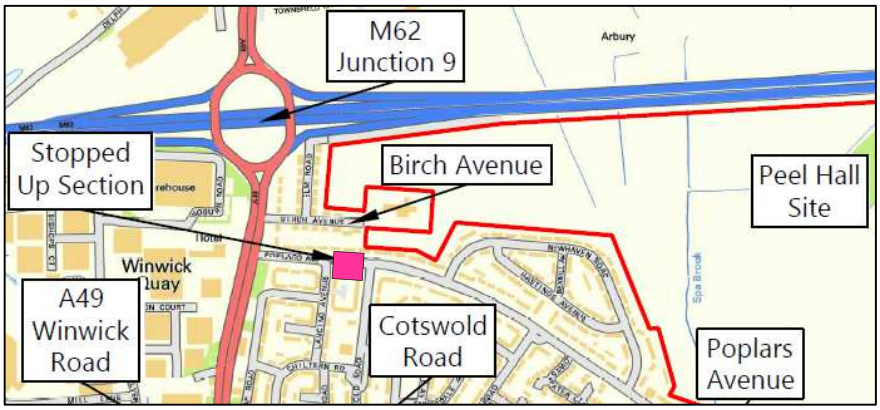


Figure 2.2 – Stopped-up section of Poplars Avenue



Existing Highway Network – Traffic Flows

2.11 The existing traffic flows during the weekday AM and PM peak hour are summarised in **Table 2.1**. below and survey data is contained in **Appendix 9**.

Table 2.1 - Existing traffic flows during the AM and PM peak hour

Road	Year	Peak Hour Two-Way Flow			
		AM		PM	
		Total Flow	HGVs	Total Flow	HGVs
Poplars Avenue	2015	522	39	566	23
Mill Lane (Blackbrook Avenue - site access)	2015	903	2	724	1
Mill Lane (Radley Lane - Delph Lane)	2015	41	0	99	0
Mill Lane (site access - Delph Lane)	2015	903	2	724	1
Delph Lane	2015	892	2	649	1
Blackbrook Avenue (Mill Lane - Capesthorne Road)	2015	741	77	633	61
Blackbrook Avenue (Capesthorne Road - Insall Road)	2014	810	12	824	7
Blackbrook Avenue (Insall Road - Birchwood Way)	2014	937	21	834	7
Birch Avenue	2014	45	0	50	0
Cotswold Road	2014	172	10	204	13
Cleveland Road	2014	373	8	451	9
Sandy Lane West	2014	943	17	1192	15
Sandy Lane	2014	410	17	399	12
Winwick Road (M62 - Sandy Lane West)	2014	3022	266	3205	146
Winwick Road (Sandy Lane West - Hawleys Lane)	2014	3070	239	3271	125
Winwick Road (south of Hawleys Lane)	2014	2943	222	2789	93
Capesthorne Road	2014	917	16	930	13
Enfield Park Road	2016	582	2	569	3
Crab Lane	2015	790	33	921	32
Birchwood Way (A50 - Blackbrook Avenue)	2015	1325	32	1346	10
Birchwood Way (Blackbrook Avenue - Crab Lane)	2014	1371	42	1383	9
Howson Road	2014	302	7	306	2
Birchwood Way (Crab Lane - Birchwood Interchange)	2016	1547	32	1385	14
A50 Long Lane	2014	1218	53	1229	20
Statham Avenue	2015	181	2	168	0
Northway	2014	288	14	285	12
Hilden Road	2014	533	19	614	6
Insall Road/Fernhead Lane	2014	630	23	652	11

Table 2.1 continued

Road	Year	Peak Hour Two-Way Flow			
		AM		PM	
		Total Flow	HGVs	Total Flow	HGVs
Cromwell Avenue	2014	373	124	451	72
Myddleton Lane	2016	203	1	205	0
Winwick Link Road	2014	1495	135	1518	50
Winwick Road (north of M62)	2014	2462	180	3117	80
M62 west	2014	8259	1460*	10655	1005*
M62 west off-slip	2014	897	194*	980	121*
M62 west on-slip	2014	798	204*	1011	99*
M62 east	2014	7825	1383*	10513	1090*
M62 east off-slip	2014	787	140*	705	137*
M62 east on-slip	2014	474	181*	1142	168*

* All traffic minus car traffic to give an approximate HGV figure

2.12 At times during the peak periods congestion can occur along the main corridors in the area including M62, Winwick Road, Sandy Lane West, Long Lane, Blackbrook Avenue and Birchwood Way, as well as elsewhere. This is considered in detail in **Section 12.0**.

Saturday/Sunday Traffic Flows

2.13 Traffic flow data for the A49 was provided by WBC for 23rd October 2017 to 19th November 2017 (included at **Appendix 10**). Two locations on the A49 were provided, location ref: 1043 on Winwick Road in the vicinity of its junction with Mill Lane (near the footbridge) and location ref: 1001 located on the A49 Newton Road near its junctions with Townfield Lane and Delph Lane immediately north of the M62 Junction 9. These locations are illustrated on **Figure 2.3**.

Figure 2.3 – WBC ATC locations

2.14 The average traffic flows have been tabulated for this data (**Table 2.2** and **Table 2.3**). It should be noted that the local school holiday that took place during the period of 23rd October to 29th October 2017 has been omitted.

Table 2.2 – A49 Winwick Road south – average traffic flows

Hour End	Days							5 Day Average	7 Day Average	2 Day Average
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday			
08:00	2686	2609	2551	2703	3127	1093	711	2735	2211	902
09:00	2761	2954	2579	2899	2910	1669	805	2821	2368	1237
10:00	2729	2862	2776	2907	2738	2216	1377	2802	2515	1797
11:00	2713	2732	2708	2842	2724	2800	2267	2744	2684	2534
12:00	2605	2785	2738	2786	2970	2965	2561	2777	2773	2763
13:00	2839	2789	2685	2740	3162	3061	2958	2843	2890	3009
14:00	2885	2715	2811	3042	2910	3299	3226	2873	2984	3263
15:00	3078	2909	3155	3260	3404	2931	3113	3161	3121	3022
16:00	2994	2667	2818	3389	3015	3051	2904	2977	2977	2977
17:00	2931	2945	3073	3320	3547	2815	2669	3163	3043	2742
18:00	3038	3141	3048	3258	2850	2755	2040	3067	2876	2398
19:00	2853	2908	2598	3018	2692	2291	1478	2814	2548	1885
Total	***34112***	***34017***	***33538***	***36165***	***36048***	***30947***	***26109***	***34776***	***32991***	***28528***

2.15 From the above **Table 2.2** it can be seen that the average weekend midday peak hour data shows that traffic flows are busier than the AM or PM peak hours on the A49 by circa 200 vehicles. However, when picking out individual day averages, e.g. a Thursday (3258vph 1700-1800) and a Saturday (3299vph 1300-1400), the data is comparable.

Table 2.3 – A49 Newton Road north – average traffic flows

Hour End	Days							5 Day Average	7 Day Average	2 Day Average
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday			
08:00	2712	2880	2205	2825	2986	1011	846	2721	2209	929
09:00	2988	2889	2652	2961	2586	1529	1092	2815	2385	1311
10:00	2705	2778	2747	2711	2496	2107	1649	2687	2456	1878
11:00	2378	2488	2480	2402	2422	2561	2413	2434	2449	2487
12:00	2436	2403	2445	2482	2606	2771	2855	2474	2571	2813
13:00	2508	2596	2625	2574	2782	2930	2857	2617	2696	2894
14:00	2690	2661	2739	2475	2766	2917	2907	2666	2736	2912
15:00	2844	2755	2735	2790	2830	2761	2774	2791	2784	2767
16:00	2756	2827	2706	2878	3160	2594	2687	2865	2801	2640
17:00	2805	2855	2667	2965	3175	2695	2333	2894	2785	2514
18:00	2889	2675	3034	2949	3008	2561	1788	2911	2701	2175
19:00	2963	2933	2835	2988	2565	1990	1354	2857	2518	1672
Total	***32674***	***32740***	***31870***	***33001***	***33383***	***28428***	***25553***	***32734***	***31093***	***26991***

2.16 From a review of the average traffic flow information in **Table 2.3** above from the ATC located on the A49 to the immediate north of the M62 Junction 9, it can be seen that generally weekend peak hours are broadly comparable in magnitude to the traditional weekday peak hours.

2.17 Therefore, it is demonstrated that the weekday peak periods are comparable in magnitude to the weekend peak period. Furthermore, a trip rate comparison has been carried out in **Section 8.0**, which sets out that the peak development flows are likely to occur on week days in the traditional peak hours and not at weekends. Therefore, it is concluded that it is not necessary to carry out further capacity analysis of the local highway network for weekend peak hours.

Existing Transport Network – Accident History

2.18 The existing accident history data for the highway network surrounding the site has been obtained for the most recent five-year period (1st May 2012 to 30th April 2017). A summary is contained in **Appendix 11** and an overview of the Person Injury Accidents (PIA) is provided following.

2.19 There were a total of 401 PIA recorded within the study area, of these, one was classified as 'fatal', 52 as 'serious' and 348 as 'slight'. This is considered to be fairly typical for an urban area of this size.

2.20 It should be noted that the majority of the accident reports provided by WBC have had their descriptions removed or omitted prior to receipt. The subsequent analysis and descriptions are therefore largely based on reported vehicular movements and locations of impact.

2.21 The 'fatal' accident occurred at the priority junction of Poplars Avenue and Martin Avenue, to the south of the study area, and involved a collision between a car turning right and a motorcycle travelling in the opposite direction. No other accidents were recorded in the vicinity of this junction during the study period.

PIA - Birch Avenue

2.22 No PIA were reported along Birch Avenue or at its junction with the A49 during the most recent five-year period available.

PIA - Poplars Avenue

2.23 Two PIA occurred along Poplars Avenue between its junctions with Newhaven Road and Windermere Avenue. Both of the accidents were classified as 'slight' (2015/2016) and did not occur in the vicinity of the proposed site access. One of the accidents involved a collision between a goods vehicle (<3.5t) undertaking a u-turn and another vehicle, while the other accident was a collision between a car and a pedestrian (not at a pedestrian crossing).

2.24 No accidents were reported at the junction of Poplars Avenue and Cotswold Road.

PIA - Grasmere Avenue

2.25 No PIA were reported on Grasmere Avenue in the vicinity of the existing access. Two PIA occurred in 2014 at the Windermere Avenue junction with Poplars Avenue. Both these accidents were classified as 'slight'; one was a nose-tail collision. The other PIA was a collision between a vehicle and a parked vehicle (the accident report states that a positive breath test was recorded).

PIA - Mill Lane/Blackbrook Avenue

2.26 No PIA were reported in the vicinity of the proposed new roundabout junction, although two accidents occurred in 2013 in the vicinity of the Mill Lane/Blackbrook Avenue/Ballater Drive roundabout. Both of the PIA were classified as 'slight'; one a nose-tail collision between two vehicles while the other accident was a collision between a car turning right and a cyclist crossing the road.

PIA – Mill Lane

2.27 No PIA were reported in the vicinity of the Mill Lane access.

PIA – A49/Poplars Avenue

2.28 One accident occurred in the vicinity of the Poplars Avenue/A49 junction (2016). The accident was classified as 'serious' and involved a collision between a vehicle and a pedestrian. The accident report states that the pedestrian was within the carriageway and not at a crossing facility.

2.29 It can be seen from the review above that there is no underlying road safety issue on the existing highway network in the vicinity of the proposed site access junctions.

PIA - Sandy Lane West/A49 Signalised Roundabout

2.30 A total of 25 PIA occurred at, or in the vicinity of, the A49/Sandy Lane West/Calver Road signalised roundabout during the five-year study period. Of the 25 accidents, three were classified as 'serious' and the remainder were classified as 'slight'.

2.31 Generally these PIA were spread across the years of 2012 (four in seven months) to 2017 (three in four months), with an apparent peak of six PIA in 2016. However, details of five of the accidents were obscured on the accident plot (recorded as one 'serious' and four 'slight' accidents).

2.32 One of the 'serious' PIA was a collision between a motor vehicle and a cyclist, the accident report sets out that the cyclist entered the carriageway from the pavement.

2.33 The other 'serious' PIA involved a car losing traction when leaving the roundabout and subsequently lost control and came off the carriageway.

2.34 Of the 'slight' accidents, nine were nose-tail collisions at various approaches, three involved vehicles entering the roundabout colliding with circulating vehicles. No other repeated accidents appear to have occurred at this junction. It can therefore be seen that there is no obvious underlying road safety issue apparent at this junction.

PIA - A50/Hilden Road Roundabout

2.35 A total of 15 PIA have been recorded in the vicinity of the roundabout junction of the A50/Hilden Road/Smith Drive and the A50/Poplars Avenue priority junction. Of the 15 PIA, two were classified as 'serious' and the remainder were classified as 'slight'. Four of the slight accident references were obscured and have been omitted from further analysis.

2.36 One 'serious' PIA involved a vehicle turning right from the A50 into Poplars Avenue colliding with a cyclist travelling in the other direction. The other 'serious' PIA involved a car entering the roundabout colliding with a circulating cyclist. The PIA were generally spread out between the years of 2012 and 2017.

2.37 Of the 'slight' PIA, one involved a vehicle reversing from a property onto Poplars Avenue colliding with a pedestrian, one involved a vehicle colliding with a street lamp and a parked vehicle, two were nose-tail collisions, four were collisions between vehicles entering/exiting the roundabout and circulating vehicles, and one was a side-side collision. It can therefore be seen that there is no obvious underlying road safety issue apparent at this junction.

PIA - Blackbrook Avenue/Insall Road/Hilden Road Signalised Four-Arm Junction

2.38 A total of three PIA occurred at the Blackbrook Avenue/Insall Road/Hilden Road signal junction, all of which were classified as 'slight' (2014). One slight accident was a collision between a pedestrian (at a pedestrian crossing facility) and a vehicle, one was a nose-tail collision and the PIA reference of the third accident was obscured and has not been included in any further analysis.

2.39 It can therefore be seen that there is no obvious underlying road safety issue apparent at this junction.

PIA - Capesthorne Road/Poplars Avenue Roundabout

2.40 A total of three PIA occurred at the roundabout junction of Capesthorne Road/Poplars Avenue/Insall Road. One PIA was classified as 'serious' and the remaining two were classified as 'slight'.

2.41 The 'serious' PIA (2017) involved a collision between a goods vehicle (<3.5t) and a pedestrian. The accident report states the pedestrian was stationary within the carriageway and not crossing.

2.42 One 'slight' PIA was a nose-tail collision and the other was a single vehicle loss of control PIA (2012 and 2016).

2.43 It can therefore be seen that there is no obvious underlying road safety issue apparent at this junction.

PIA - College Place Roundabout

2.44 A total of 24 PIA occurred in the vicinity of the Woolston Grange Avenue/Birchwood Way/Crab Lane roundabout. Of the 24 PIA, three were classified as 'serious' and the remainder were classified as 'slight'. Of the 24 accidents, the references of 11 accidents (one 'serious' and ten 'slight') were obscured and consequently omitted from further analysis. Generally the PIA appear to have occurred evenly throughout the five-year analysis period.

2.45 One 'serious' PIA occurred between a car a cyclist. The accident report states that the cyclist rode off of the pavement into the path of the car with which it subsequently collided. Another 'serious' accident involved a motorcyclist stopping, but no other vehicles were involved.

2.46 Of the remaining 10 'slight' PIA, five were nose-tail colisions, one was a collision between a right turning car and a pedestrian, one was a 'left hook' type collision, two were collisions between cars changing lanes and cars in the adjacent lane, and one was a single vehicle PIA involving a motorcycle setting off.

2.47 It can therefore be seen that there is no obvious underlying road safety issue apparent at this junction.

PIA - Enfield Park Road/Crab Lane Priority Junction

2.48 No PIA were reported in the vicinity of the Enfield Park Road/Crab Lane priority junction.

PIA - Birchwood Way/Blackbrook Avenue Roundabout

2.49 A total of nine PIA occurred at the Birchwood Way/ Blackbrook Avenue roundabout. Of the nine PIA, two were classified as 'serious' and the remainder were classified as 'slight'. Of these, the references of three were obscured (one 'serious and two 'slight') and have consequently been omitted from further analysis.

2.50 The 'serious' PIA involved a car entering the roundabout colliding with a circulating motorcycle. The 'slight' PIA include a single vehicle accident involving a motorcycle turning left, three nose-tail collisions and a collision between a car and a pedestrian at a pedestrian crossing. Generally the PIA appear to be spread evenly throughout the five-year period studied and it can be seen that there is no obvious underlying road safety issue apparent at this junction.

PIA - Junction 9 M62

2.51 There were nine PIA recorded at the M62 Junction 9 roundabout throughout the five-year period analysed; one was classified as 'serious' and eight were classified as 'slight'.

2.52 The serious PIA occurred as a result of a car changing lane into the path of a motorcycle. Two of the 'slight' PIA also occurred as a result of a vehicle changing lane into the path of another.

2.53 Five of the 'slight' PIA occurred as a result of a shunt-type accident. One also occurred as a shunt-type collision, but escalated with a driver altercation.

2.54 It can therefore be seen that whilst the accident history at this junction is not significant in terms of severity or frequency of accidents, those that occurred were the result of shunt or lane changes.

PIA - A49 Newton Road/Winwick Road Roundabout

2.55 There were nine recorded PIA at this roundabout; one 'serious' and eight 'slight'. Generally these have occurred evenly throughout the five-year period studied. The 'serious' PIA occurred between a car and a motorcycle on the roundabout circulatory.

2.56 Four PIA occurred as a result of shunt-type collisions, one occurred as a result of a vehicle changing lane into the path of another vehicle, one occurred as a result of a vehicle carrying out a u-turn manoeuvre and two occurred as a result of loss of control-type accidents (one a car and one a motorcycle).

2.57 It can therefore be seen that there is no major road safety issue at this junction.

PIA - A49 Newton Road/Winwick Road Roundabout

2.58 Two 'slight' PIA were recorded at this junction on the A49 and were shunt-type collisions (2014, 2016). A third PIA was recorded on the Delph Lane link to this junction (2015), although due to lack of information is it not clear if it occurred in queuing traffic at this junction or at the adjacent junction with the B&Q retail store.

2.59 It can therefore be seen that, due to the few number of recorded accidents at this junction, there is no obvious underlying road safety issue apparent.

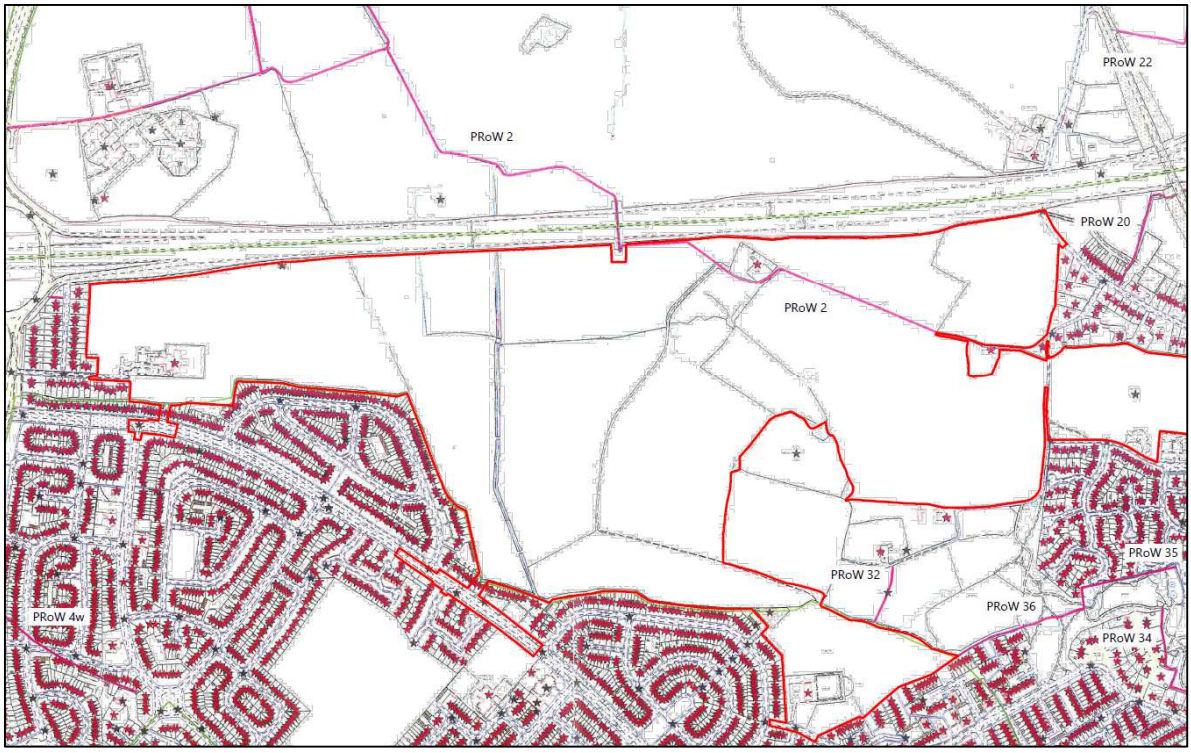
Existing Transport Network – Pedestrian

2.60 There are continuous footways located on both sides on most of the local roads within the vicinity of the site, which are generally flat and illuminated. Footways are often segregated from the main carriageway by a verge approximately one metre wide and Zebra crossings are intermittently provided throughout the area. Close to local schools 20mph zones have been introduced as well as along parts of Poplars Avenue.

2.61 To the south of Birch Avenue there is a footbridge across Winwick Road that helps provide access from the site area to the Winwick Quay Business Park and beyond. Local facilities and services are discussed in **paragraphs 2.86** to **2.88**.

2.62 Existing pedestrian access into the site is from Mill Lane, Radley Lane in the east; and Birch Avenue and Elm Road in the west. There is a footbridge across the M62 which forms part of PRoW Number 2 and links with A49 and Winwick to the north of the site via PRoW 1, 1a, 3 and 5. The local PRoW are illustrated in the plan that forms **Appendix 12** and below in **Figure 2.4**.

Figure 2.4 – PRoW in close proximity to the site



2.63 CIHT publication "Providing for Journeys on Foot" identifies acceptable walking distances for pedestrians. This confirms that for commuting, up to two kilometres is the preferred maximum walking distance. **Appendix 13** contains a plan showing walking isochrones based on two kilometres from the centre of the site. This plan confirms that pedestrian connectivity to the Peel Hall site is very good and that walking is a realistic alternative mode of travel to the private car.

Existing Transport Network - Cyclist

2.64 Local cycling facilities comprise off-carriageway segregated cycleways and footways along the A49 Winwick Road from the junction with Long Lane to the town centre. On-carriageway cycleways and advanced stop lines (ASLs) are also provided, for example at Winwick Road junction with the A50 Long Lane and the A49 junction at the Warrington Wolves Halliwell Jones Stadium.

2.65 Additional off-carriageway cycle routes exist in the vicinity of junctions including the A50/Hilden Road/Smith Drive roundabout and the Insall Road/Blackbrook Avenue signalised junction.

2.66 There are also signed shared footway and cycleway routes along some existing footways, often linking into local retail and employment areas such as the Alban Retail Park.

2.67 The whole of the site is around five kilometres from the centre of Warrington by public highway. A cyclist from the site travelling to the town centre would typically use the following routes via A49 Winwick Road, from Poplars Avenue:

i. Cotswold Road/Cleveland Road to Sandy Lane, then Northway, connecting to the A49 at the Long Lane junction; or
ii. Howson Road connecting to Northway, and as above; then
iii. at the Halliwell Jones Stadium cyclists will have a choice to use the ASL's or the toucan crossing facilities and continue into the centre via their on-road route of choice such as Lythgoes Lane to A57/Brick Street or the more lightly trafficked Winwick Road/Winwick Street to access, for example, Warrington Central Station.

2.68 Cyclists travelling from/to locations closer to the east of the site would typically use:

i. Blackbrook Avenue; then
ii. Capesthorne Road, A50 Long Lane and A49 Winwick Road (then as **paragraph 2.67 iii** above); or
iii. Hilden Road, Smith Drive, O'Leary Street, Orford Lane crossing A49 Winwick Road onto Pinners Brow.

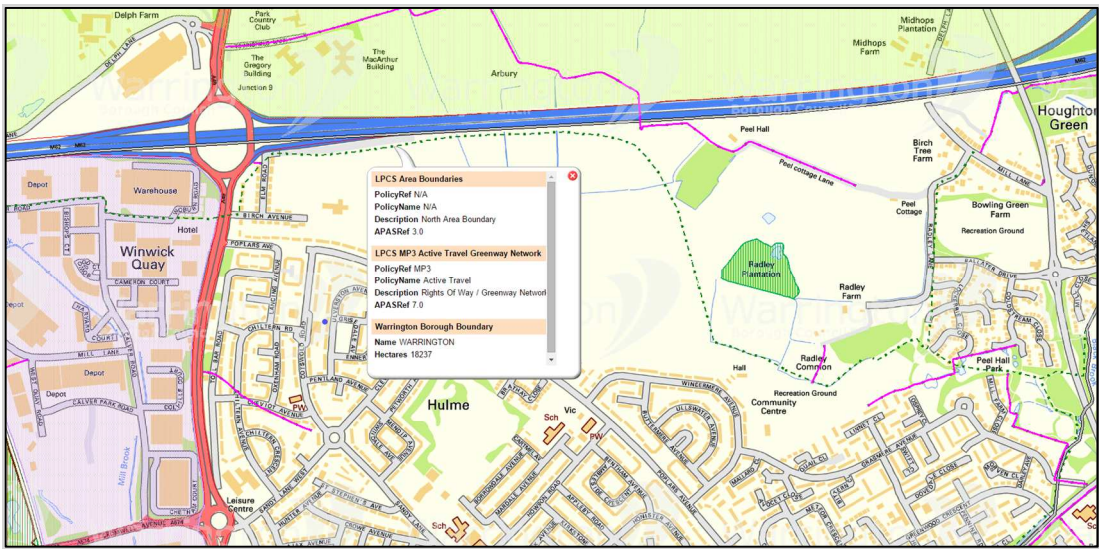
2.69 It generally agreed that an acceptable cycling distance is around five kilometres. **Appendix 14** contains a plan showing cycling isochrones based on five kilometres from the centre of the site. This plan shows that there are a large number of destinations that are accessible from the Peel Hall site by cycle including the town centre. Therefore it can be concluded that the site is located in an area that will support and encourage cycle travel.

2.70 **Appendix 14** also includes a copy of the WBC Cycle Route Plan for reference.

Greenway Network

2.71 WBC have highlighted that they have an aspirational Greenway network that runs through the Peel Hall site as shown in the extract at **Figure 2.5** below and contained in **Appendix 15**.

Figure 2.5 – Greenway network



2.72 The WBC Design Guide sets out that a Greenway is a network of, "*…mainly off-road routes shared by pedestrians, cyclists, and where appropriate, horse riders for the purpose of community or leisure*". WBC's Greenways generally follow existing PRoW and other footpaths and cycleways with the Greenway created by, for example, improved signing and suitable surfacing.

2.73 A Greenway network across the Peel Hall site will benefit existing residents by providing formalise routes for pedestrians and cyclists as well as the potential for bridleway links for equestrians. This will promote leisure activities that have health benefits for existing and future residents.

Existing Transport Network – Bus

2.74 A table setting out the existing bus services that currently serve the Peel Hall area is provided in **Appendix 16** and the existing services that currently operate close to each of the proposed site accesses can be summarised as follows:

i. Main Access (Mill Lane arm Blackbrook Avenue Roundabout) and Mill Lane.
Services 23 and 23A; 25A; 26 and 26E and 27E.
ii. Main Access - Poplars Avenue.
Services 20 and 20A; 21, 21A and 21E; 25 and 25A; 26 and 26E and 27.
iii. Poplars Avenue - Employment Access.
Services 19; 20 and 20A; 21, 21A and 21E; 22; 329 and 360.
iv. Birch Avenue.
Services 19; 20 and 20A; 21, 21A and 21E; 22; 329 and 360.
v. Grasmere Avenue (access to sports pitches).
Services 20 and 20A; 21, 21A and 21E; 25 and 25A; 26; 27.

2.75 All services connect this part of Warrington with the town centre. Services 25, 26, 26E and 27 provide access to Birchwood Station and Birchwood Park in the east. Services 23, 23A, 27 and 27E stop around 800 metres from Padgate Station. **Appendix 16** also includes a Network Warrington route map and timetables for services 20/21 and 23/23A. The existing bus stops in close proximity to the site accesses are shown on the Google Maps extract in **Figure 2.6** below.

Figure 2.6 – Existing bus stops in close proximity to the site (shown blue)

Taken from Google Maps www.google.co.uk/maps Accessed 28/06/16
Reviewed 05/01/18

2.76 It is considered that the level of bus provision to the site is very good. At peak times these existing routes are well used, especially closer to the centre of Warrington. Existing journey times by bus from the site to key locations are set out in **Table 2.4**.

Table 2.4 - Existing bus journey times from closest bus stop to key locations

From Existing Bus Stop Closest to Proposed Site Access	Key Locations – Journey Time					
	Town Centre	Birchwood Station	Birchwood Park	Warrington Business Park & Collegiate	Warrington Campus University of Chester	Orford Jubilee Hub
Poplars Avenue west	15-18min	-	-	6min	-	8min
Poplars Avenue central	14-20min	23min	15min	10min	8min	12min
Mill Lane/ Blackbrook Ave	17-22min	17-20min	9-10min	9-10min	3min	7min*

* Monday-Saturday Evenings, Saturdays

2.77 It can therefore be concluded that the existing bus provision close to the site is very good and that these services will present a genuine modal choice for future residents of Peel Hall, irrespective of additional bus related mitigation measures.

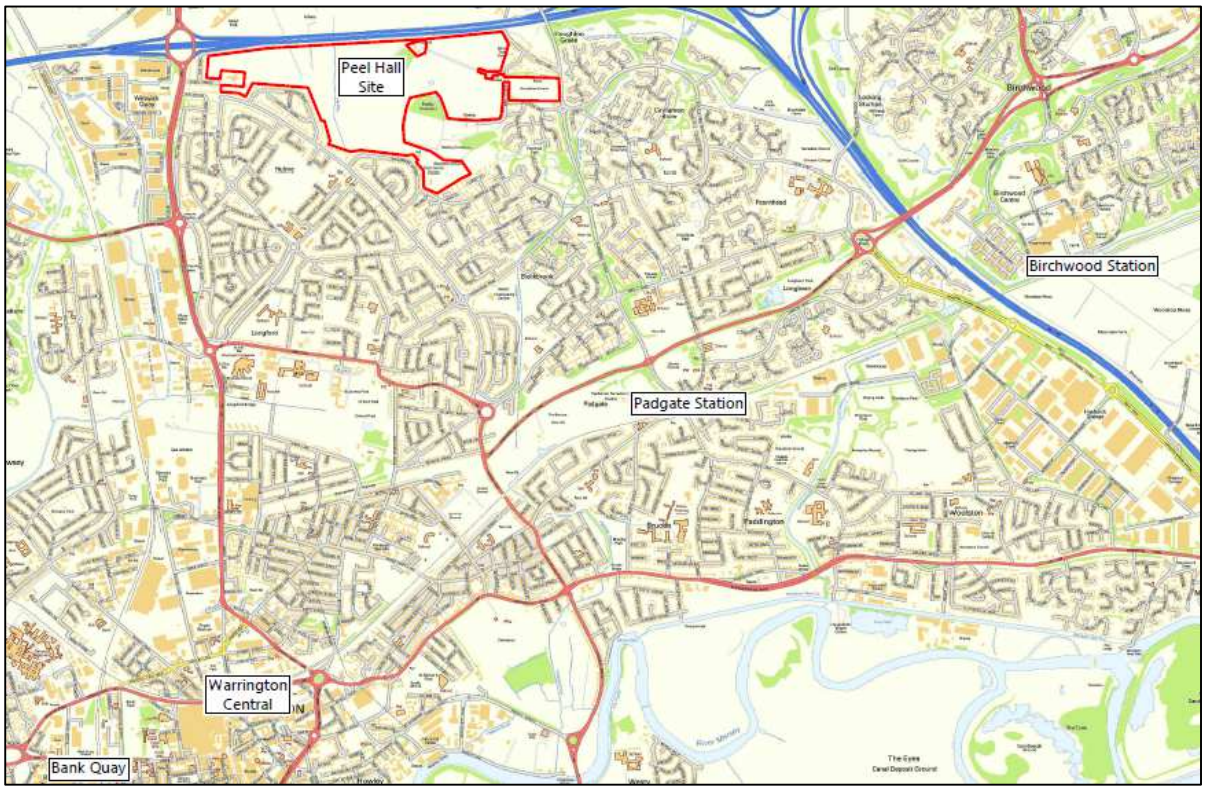
Rail Network

2.78 Existing rail stations that serve Warrington are:

i. Padgate - on the Manchester to Liverpool Line. This is approximately 3.0 kilometres from the site.
ii. Warrington Central - on the Manchester to Liverpool line. This is approximately 3.5 kilometres from the site.
iii. Warrington Bank Quay - on the West Coast Mainline. This is approximately 4.5 kilometres from the site.
iv. Birchwood - on the Manchester to Liverpool Line. This is approximately 5.2 kilometres from the site.

2.79 These stations are illustrated on the plan shown in **Figure 2.7** below.

Figure 2.7 – Location of the site and proximity to local railway stations



2.80 A summary of the railway services is as follows:

i. Manchester - four per hour, 20 minute journey time.
ii. Liverpool - four per hour, 22 minute journey time.
iii. Preston - two per hour, 22 minute journey time.
iv. Birmingham - four per hour, 1.5 hour journey time.
v. London - two per hour, 2.5 hour journey time.

2.81 Cycle parking at each of these stations can be summarised as follows (http://www.nationalrail.co.uk/stations_destinations/):

i. Padgate – No cycle parking facilities
ii. Birchwood – Cycle parking facilities on each platform in the vicinity of the footbridge. Brompton bike hire provided in the car park of this station (see **Photograph 2.2** below).
iii. Warrington Central – Total of 116 cycle parking spaces split between platforms 1 and 2. Cycle storage area are covered by CCTV.
iv. Warrington Bank Quay – 28 cycle parking spaces outside the main station and eight cycle parking spaces on Platform 3/4.

2.82 The time taken to cycle to these railway stations from the site, based on a journey speed of 320 metres per minute (DfT Transport Note 2/08 'Cycle Infrastructure Design', October 2008), is summarised in **Table 2.5** on the page below.

Photograph 2.2 – Brompton bike hire, Birchwood Rail Station

Table 2.5 – Cycle times from the site to railway stations

Station	Distance	Approximate Cycle Time
Padgate	3.0km	10min
Warrington Central	3.5km	11min
Warrington Bank Quay	4.5km	14min
Birchwood	5.2km	17min

2.83 It can be seen from **Table 2.5** above that generally the railways stations are within a 10 to 20 minute cycle ride from the site. This is therefore considered to be a realistic modal choice, and provides future residents with alternative options for non-car travel.

2.84 It is therefore concluded that existing public transport facilities are very good and that rail travel is a realistic travel choice for commuter journeys for future residents of the Peel Hall site.

2.85 Overall the Peel Hall site is considered to be located in a highly sustainable and accessible location with excellent public transport facilities close by that will be enhanced by the proposed package of bus and Travel Plan related mitigation measures.

Local Services and Amenities

2.86 There is a good range of services and amenities available via the bus services that serve the Peel Hall area at present, including employment, retail, secondary and further education, medical and leisure uses. Most of these services and amenities are also within easy cycle distance of the site.

2.87 There are few services and amenities within 1.0 kilometres of the centre of the site; mainly Radley Park, public houses and bus stops. It is around 1.5 kilometres before there is employment, retail and primary school facilities available and around 2.0 kilometres before secondary school facilities are available.

2.88 **Appendix 17** contains a plan showing services and facilities in this part of Warrington.

2.89 It is considered that the creation of a mixed-use development in this location will provide a benefit to existing residents, with the provision of a local centre, food store, family pub/restaurant, open space and sports and community facilities.

3.0 Transport Policy and Guidance

3.1 Throughout the development of the scheme, account has been taken of both national and local transport related policy and guidance.

3.2 The following should be considered when examining the development related transport policy aspects of the proposed neighbourhood:

i. National Planning Policy Framework (March 2012).
ii. Local Plan Core Strategy for Warrington (Adopted July 2014) – Policies CS1 (seventh and eleventh bullets); QE6 (fifth, sixth and tenth bullet); QE7 (third bullet); MP1 (All bullets); MP3; MP4; MP7 (both bullets); and MP10 (first, second and third bullets).
iii. Warrington Local Transport Plan 3 – 2011 to 2030 (March 2011) and Travel Plan Design Guidance Note DGN2 (August 2016).
iv. Warrington Design Guide Residential and Industrial Estate Roads (2008).
v. Manual for Streets (2007) and Manual for Streets 2 (2010).

3.3 The thrust of these policies and guidance is to encourage development that will be accessible to all, that is safe and that will be sustainably located or can be made to be sustainably located by the introduction of mitigation measures.

3.3 Where these policies relate to highway and transport issues they have been considered further below.

National Planning Policy Framework (NPPF) 2012

3.4 The NPPF sets out how the Government's planning policies should be applied and represents the framework for achieving sustainable development. In transport terms the thrust of NPPF is to:

i. Manage patterns of growth to make the fullest use of public transport, walking and cycling and focus significant development in locations which are or can be made sustainable (para 17).
ii. Ensure planning decisions (para 32) take account of whether:
    - the opportunities for sustainable transport modes have been taken up;
    - a safe and suitable access to the site can be achieved for all people;
    - improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.
iii. Locate development where the need to travel will be minimised and the use of sustainable modes can be maximised, although this needs to take account of policies set out elsewhere (e.g. para 47- significantly boost housing supply) in the Framework (para 34).
iv. Locate and design where practical, developments to give priority to pedestrian and cycle movements, and to have access to high quality public transport facilities (para 35) and to facilitate this provide a Travel Plan (para 36).

3.5 The executive summary of the committee report (**Appendix 1**) confirms that, "*…in principle the proposal is capable of bringing significant potential benefits as a sustainable "urban extension" to the northern edge of Warrington, without intruding into Green Belt*". The key principle in the design of this masterplan has been to make sure that the site becomes a sustainable location with walking, cycling and public transport access to services and facilities required on a daily basis. In this case the public transport improvements and the mix and layout of the development will encourage sustainable travel and reduce car trips whenever possible.

3.6 In paragraph 32 of the Framework, it confirms that in terms of the need to improve the transport network, development should only be refused on transport grounds where the residual cumulative impacts are severe. As set out in **Sections 13.0**, **14.0** and **15.0** of this report, the cumulative impact of the proposed development at Peel Hall is not severe.

Local Plan Core Strategy for Warrington (2014)

3.7 Reason for refusal 1 refers to Policies CS1 (seventh and eleventh bullets); QE6 (fifth, sixth and tenth bullet); QE7 (third bullet); MP1 (All bullets); MP3; MP4; MP7 (both bullets); and MP10 (first, second and third bullets). In addition, Policy CS4 specifically refers to transport. In transport terms the thrust of these policies is set out below.

3.8 Policy CS1 (seventh and eleventh bullets) – This relates to the Council working proactively with applicants in order to deliver sustainable development and in this case specifically in relation to making the best use of existing transport infrastructure and safeguarding safety.

3.9 It is agreed that in principle the appeal proposals represent a sustainable urban extension, add to the existing transport infrastructure and the access arrangements have been the subject of an independent Road Safety Audit.

3.10 Policy CS4 - This relates to development requiring to be related to where there is the opportunity to reduce the need to travel, especially by car and to enable as far as possible to meet their needs locally.

3.11 As set out above the public transport improvements and the mix and layout of the development will encourage sustainable travel and reduce car trips.

3.12 Policy QE6 (fifth, sixth and tenth bullet) – This relates to the need to submit detailed assessments on environmental and amenity protection and in this case specifically in relation to air quality, noise and vibration and the effects and timing of traffic movement and car parking including on highway safety.

3.13 The application does not have an unacceptable adverse environmental impact on the amenities of neighbouring properties or residents and the surrounding area, as set out in the Environmental Statement (ES) accompanying the application.

3.14 Policy MP1 – This relates to general transport principles such as reducing private car use; prioritising facilities for public transport, pedestrians and cyclists; the provision of cycle and car parking; and providing mitigation or improvements to the transport network as a result of development.

3.15 As set out above, the development of this site places sustainable travel modes at the central core of the scheme.

3.16 Policy MP3 – This relates to the needs and safety of pedestrians and cyclists within a new development and which should contribute to enhancing and developing integrated networks of continuous, attractive and safe routes for walking and cycling including improvements to roads, Rights of Way and the Greenway network. The Peel Hall masterplan has been prepared with these objectives at the core of its design.

3.17 Policy MP4 – This relates to improvements to the public transport network and where development is located. Most of the appeal site is already very well served by existing bus services and the bus mitigation measures proposed will result in the development having excellent public transport links.

3.18 Policy MP7 – This relates to the need for Transport Assessments and Travel Plans to support development with the aim of showing that development will not significantly harm safety and can be accommodated by the transport network. In this case it specifically relates to identifying where significant effects will occur and the measures needed to mitigate the impact.

3.19 As well as an umbrella Framework Travel Plan, the proposals are supported by this comprehensive Transport Assessment, which identifies where significant effects will occur and the measures needed to mitigate the impact, and concludes that the development will not significantly harm safety and can be accommodated by the transport network (see **Section 15.0** and **Section 17.0**).

3.20 Policy MP10 (first, second and third bullets) – This relates to securing the infrastructure improvements arising from development and in this case specifically in relation to the provision of a S106 Agreement and/or a CIL contribution. The infrastructure obligations and mitigation measures proposed will be secured by either planning condition or S106 Agreement.

Warrington Local Transport Plan 3 - 2011 to 2030 (LTP3) and DGN2 on Travel Plans (August 2016)

3.21 LTP3 sets out the Council's transport strategy between 2011 and 2030 and in particular where resources should be targeted during this period. It identifies several policy themes including Active Travel (e.g. walking and cycling), Public Transport, Managing Motorised Travel (e.g. influencing parking charges in the town centre, encouraging car sharing, providing charging points for electric vehicles), and the use of Smarter Choices by influencing the decisions people make about travelling. DGN2 sets out that the objective of a Travel Plan is to reduce congestion and encourage healthier travel choices. **Appendix 18** contains extracts from LTP3 and DGN2.

3.22 As discussed above, the masterplan has been designed to ensure that the site becomes a sustainable location with walking, cycling and public transport access to services and facilities required on a daily basis. In addition to the public transport improvements the proposals are supported by a Framework Travel Plan which sets out measures to encourage sustainable transport modes at the expense of car trips, especially single occupancy trips. As the development phases progress, a number of bespoke full Travel Plans will be produced.

Warrington Design Guide 2008

3.23 The thrust of the Design Guide is to:

i. Provide guidance for the design of roads within new developments (Forward).
ii. Encourage a flexible approach in order to create a well-designed street (para 1.1).
iii. Confirm that the Council would not expect a rigid adherence to every guideline (para 2.3).
iv. Move away from a road hierarchy based on traffic flows or the number of dwellings served (para 3.2).
v. Confirm that it is not intended to present a rigid set of rules that must be followed but instead give guidance on the flexibility of use (para 4.2).

3.24 The Design Guide was used in the development of the masterplan and extracts from this document are contained in **Appendix 19.**

Manual for Streets (2007) and Manual for Streets 2 (2010)

3.25 Manual for Streets and Manual for Streets 2 provides technical guidance on the design of residential streets and promotes inclusive environments and sustainable modes of transport whilst striking a balance between the needs of different users.

3.26 In Manual for Streets 2 (Chapter 3 – Highway Design, Risk and Liability) the document:

i. Discourages the rigid adherence of design guidelines (paras 3.2.1 and 3.2.2).
ii. Encourages designers to move away from a standardised rigid approach (para 3.1.3).
iii. Encourages designers to use professional judgement and not to be over reliant on guidance (para 3.2.3).
iv. Encourages designers to take a flexible approach to the interpretation and application of numerical values associated with a particular geometric parameter (Introduction to Section B).

3.27 Manual for Streets and Manual for Streets 2 were used in the development of the masterplan and extracts from this document are contained in **Appendix 20**.

Policy Compliance

3.28 Given the above it is considered that the proposed residential neighbourhood complies with the above policies and documents.

3.29 Guidance has also been taken from the following local and national documents:

i. Planning Practice Guidelines (2014).
ii. Guidance on Transport Assessment (2007) published by DfT and DCLG.
iii. DfT Circular 02/2013 - Strategic Road Network and the Delivery of Sustainable Development (2013).
iv. The Strategic Road Network Planning for the Future (2015) published by HE.
v. WBC's Standards for Parking in New Development (2015).
vi. WBC's CIL Preliminary Draft Charging Schedule Consultation (October 2015).
vii. WBC's SPD on Design and Construction (2010).

Significance of Impact

3.30 When reviewing the impact of the Peel Hall development on the local and wider highway network, the terms used to define the traffic impacts have been assessed on the following:

i. Queue lengths long enough to block another junction or traffic stream.
ii. Average delay per vehicle.

3.31 The ratio of flow to capacity (RFC) is a technical measure of congestion that relates less directly to the road user's experience than average delay, so a fixed criterion is not always appropriate for this measure. However, as a guide, increases to or above 0.9 have been used as a general guide due to the existing high levels of congestion on the network.

3.32 In summary, junctions were considered to have a major to moderate adverse significance based on:

i. An increase in RFC of 5% or more for a Do Something scenario above a Do Minimum scenario RFC of 85% or more.
ii. An increase in RFC of 3% or more for a Do Something scenario above a Do Minimum scenario RFC of 90% or more.
iii. Where queue lengths were shown to increase in the Do Something scenario beyond that of current stacking capacity on the existing network.
iv. Where junctions were shown to have a capacity of 85% or above in the Do Something scenario compared to results below 85% in the Do Minimum.

3.34 Where junctions have been assessed to be adversely impacted by the development, a set of appropriate mitigation schemes have been devised and tested (see **Section 15.0**). These mitigation measures ensure that no severe impacts occur as a result of development at Peel Hall.

4.0 Development Proposals

4.1 The development proposals have been influenced by the public consultation held in January 2016 and discussions with officers, including matters arising from the WBC highway officer consultation response contained in **Appendix 5**.

4.2 The proposal is for a new residential neighbourhood on land at Peel Hall with the planning application submitted for outline approval and with all matters reserved except for means of access. The access and transport strategy that underpins the proposed development can be summarised as:

i. To provide as far as reasonably practicable a largely self-contained development through the provision of a mix of uses including a local centre, a primary school and an area of employment.
ii. To provide a high-quality access and connectivity within the development for bus, pedestrian and cycle movement in order encourage non-car modes of travel and subsequently reduce car use.
iii. To provide a new bus service that links the site to key locations including the town centre, Orford Jubilee Hub, Warrington Business Park and Collegiate, Warrington Campus of University of Chester, Birchwood Community High School and College, Birchwood Park and Birchwood Shopping Centre.
iv. To distribute development traffic from the site onto the local highway network at different points in order to reduce the impact.
v. To protect the residential area to the south from development traffic.
vi. To provide strong pedestrian and cycle links with the existing and surrounding area as this will help ensure that the development is well integrated with the local community.

4.3 Two access options are considered as part of this transport assessment work, as set out at **Section 5.0**, these are:

Option A A non through route scenario, with the development served by six separate access points

Option B A through route scenario, with a through route between the proposed roundabout junction on Mill Lane and the A49 via a new signalised junction with Poplars Avenue.

4.4 The key points of the Peel Hall access strategy are to:

i. Provide a new bus service that links the site to key locations including the town centre, Orford Jubilee Hub, Warrington Business Park and Collegiate, Warrington Campus of University of Chester, Birchwood Community High School and College, Birchwood Park and Birchwood Shopping Centre (see **Section 6.0**), to provide genuine modal choice for future and existing residents.
ii. Distribute development traffic from the site onto the local highway network at different points in order to reduce the impact.
iii. Mitigate development traffic impact through the introduction of bus measures, highway improvements and travel plan measures.

4.5 It is appropriate to note that the officer's committee report of February 2017 (**Appendix 1**) set out that the, "*…proposal is considered to be a sustainable urban extension…*" and "*…has the potential to deliver substantial transformational benefits…*".

The Development

4.6 For the purposes of this assessment the development is assumed to comprise:

i. Up to 1,200 residential dwellings. This will include a mix of market and affordable homes as well as houses and apartments. The houses are expected to be a mix of two, three and four bedroomed houses and one and two bedroomed apartments. It is anticipated that up to 60 of these dwellings will be provided as a retirement home development.
ii. A 100 bedroomed care home.
iii. An area of employment land comprising up to 7,500sqm Gross Floor Area (GFA) of light industrial units.
iv. A local centre comprising a food store of up to 2,000sqm GFA plus up to a further 600sqm GFA of local centre type facilities (such as A1-A5 and D1) plus a family pub and restaurant of up to 800sqm GFA. The local centre car park will be located so that it can also be conveniently used as a school drop off facility.
v. Up to a two-form entry primary school with a maximum of up to 420 pupils.
vi. Relocating and upgrading of existing sports pitches to provide like-for-like replacement in terms of number of pitches and the provision of ancillary facilities, which are expected to include changing facilities for up to four teams at any one time and a function room that can be used for local community uses such as a mother and toddler group.

Proposed Pedestrian and Cycle Access

4.7 Additional pedestrian and cycle access will be provided from Elm Road at the north-western corner of the site along the northern boundary of the employment land, providing a link between the site and the A49 to the west of the site and the village of Winwick to the north. This is shown on the Landscape Components Plans contained in **Appendix 21** and an extract illustrating the Option A layout is provided as **Figure 4.1**.

Figure 4.1 – Landscape Components Plan – Option A

4.8 There is an existing footbridge over the M62 (serving PRoW route number 2) which will form a pedestrian link to and from the site and the areas north of the motorway. There will also be links through to the south of the site via Radley Common to the existing playing fields, which will provide a link through to Windermere Avenue and Grasmere Avenue and the proposed club house that will also be used by the local community; as well as links to Peel Hall Park and through to Blackbrook Avenue in the east.

4.9 Radley Lane will also continue to provide a pedestrian link to the east of the site, and access will be maintained to Houghton Green off Mill Lane and to the PRoW and local footway networks beyond, including to the northeast via Delph Lane. It is proposed that a section of Radley Lane between the proposed distributor road and Radley Lane will be stopped up to motorised traffic and used as a pedestrian and cyclist route. All traffic from Radley Lane south of the distributor road will use the new junction with the distributor road and access the local highway network at Mill Lane/Blackbrook Avenue rather than routing through the residential area of Mill Lane to the north.

4.10 As set out in **Section 2.0**, the Greenway network will be accommodated through the Peel Hall development by the inclusion of 3.5 metre wide shared cycleway and footway links.

4.11 It should be noted that internal connectivity for sustainable travel modes i.e. walking, cycling and bus travel is shown within the illustrative masterplan, Parameters Plans and accompanying Landscape Component Plans contained in the Environmental Statement that supports the proposals, and would be secured through future reserved matters applications.

4.12 Pedestrian connectivity through and around the site, and links to existing footways and PRoWs, has been designed into the Peel Hall masterplan to enhance pedestrian routes and encourage future and existing residents to walk. It is considered that the proposed pedestrian provision is very good.

4.13 In terms of the proposed Peel Hall scheme, off road shared cycle routes are proposed throughout the development. These will provide a link from the west at the A49 to the east at Blackbrook Avenue, and linking to the south at Poplars Avenue.

4.14 The Landscape Components Plans (**Appendix 21** - Option A and Option B) demonstrate that WBC's Greenway network aspirations are facilitated through the Peel Hall development via the extensive pedestrian and cycle routes proposed. These facilities will ensure that the development site is fully permeable for non-motorised users. Furthermore, it is expected that as the parcels of land come forward for development, additional pedestrian and cycle links will be created throughout to support accessibility throughout the site, and also ensuring ease of access on foot to bus stop facilities. an extract illustrating the Option B layout is provided as **Figure 4.2**.

Figure 4.2 - Landscape Components Plan – Option B

4.15 As shown illustratively on the Landscape Components Plans, the proposed footpath network adjacent to the northern boundary of the Peel Hall site between Elm Road in the west and Mill Lane in the east, and will be provided within a landscaped area of screening. It is possible that this could support a suitably surfaced equestrian route between Mill Lane in the east and Elm Road in the west. The proposed routes through the site for non-motorised users indicated on the Landscape Components Plans (**Appendix 21**) have the potential to extend the Greenway network towards Peel Hall Park also, which has a permissive bridleway.

4.16 Therefore, the Peel Hall development will contribute to the enhancement and development of, "*…integrated networks of continuous, attractive and safe routes for walking and cycling…*" (WBC Core Strategy Policy MP3). This is will provide a real benefit for existing and future residents and support and encourage sustainable modes of travel as well as promote healthier living by providing improved leisure routes that link to the wider network.

Emergency Access

4.17 Under Option A it is proposed that an emergency link will be provided between the employment access road (at the turning head) and the main development distributor road. An emergency link via the existing site access at Elm Road to the northwest of the site can be provided for the employment area.

4.18 An emergency link is also proposed between Poplars Avenue (central) access and the school, across the north of the local centre car park. Further emergency links can be created between the main distributor road at Radley Lane to the north and east.

4.19 Under Option B, emergency links are still proposed between Poplars Avenue (central) and the school, Elm Road to the northwest, and connections through to Radley Lane to the north and east.

4.20 As part of the future reserved matters applications, it is expected that the layout of individual plots will also facilitate emergency access where appropriate.

Proposed Bus Access

4.21 A new bus route will be provided through the site via the local distributor road connecting the central access on to Poplars Avenue with the other main site access on the Mill Lane arm of the Blackbrook Avenue roundabout.

4.22 A bus gate will be introduced along this route around 500 metres north of the Poplars Avenue (central) junction to ensure that a through route for general motor vehicle traffic is not created between Poplars Avenue and the distributor road. **Appendix 22** contains photographs of typical bus gates in use at present, although an alternative would be to install Automatic Number Plate Recognition. The form of the bus gate is to be agreed with WBC at the reserved matters stage.

4.23 The proposals to ensure high quality access by bus are set out in detail in **Section 6.0** and will comprise an extension to existing services into the site during the construction phase and the creation of a new service through the site once the distributor road is completed.

4.24 This new service between Warrington town centre and the employment area at Birchwood will provide excellent links to the wider area and be an attractive non-car modal choice for future residents and also create more choice for existing residents.

Travel Plan Measures

4.25 As set out in Warrington's DGN2 on Travel Plans (August 2016), Travel Plans should aim to reduce congestion and encourage healthier travel choices.

4.26 Separate Travel Plans or Travel Plan Statements will be produced for the residential, employment and food store uses as well as the care home and primary school, which shall include measures to assist with the provision of sustainable forms of transport by occupiers of and visitors to the specific Phase/Plot of development. These obligations are expected to be secured by planning conditions and/or by Section 106 obligations.

4.27 An umbrella Framework Travel Plan has been provided as a standalone document (HTp/1107/FTP/01 dated January 2018) to support the development proposals and inform the full Travel Plan. See Section 106 heads of terms at **Section 16.0** for more detail.

4.28 The key features of the development and the Framework Travel Plan will be to:

i. Cycle parking provision throughout the site that meets WBC's guidelines.
ii. Car parking provision that meets the WBC's guidelines.
iii. The provision of £250 worth of sustainable travel vouchers for the first occupants of the residential dwellings to be used to assist, for example, in the purchase of public transport tickets and/or cycles/cycle accessories.
iv. The production and promotion of a Travel Information Pack to be provided to residents on first occupation.

4.29 The umbrella Framework Travel Plan confirms that the proposed development will be located in a highly sustainable and accessible location with excellent public transport facilities.

4.30 The objective of the Travel Plan documents will be to achieve the following outcomes:

i. Minimise car ownership and car travel to, from and within the development.
ii. Identify which measures are needed to maximise the use of non-car travel.
iii. Encourage residents and employees to adopt sustainable travel patterns from the start and then maintain that approach.
iv. Identify ways of reducing the need to travel to and from the development.

4.31 These aims, objectives and outcomes will be achieved by:

i. Having a development that is located in a highly sustainable and accessible location.
ii. Providing high quality, covered and secure on-site cycle parking that is easily accessible for residents, employees and visitors with spaces that accord with WBC's guidelines.
iii. Providing car parking that accords with local policy.
iv. The production and promotion of a Travel Information Pack to be provided on first occupation of each unit.
v. The provision of £250 worth of vouchers per unit on first occupation of the residential dwellings to be spent on sustainable travel.

4.32 The Travel Information Pack will include details of:

i. Local pedestrian and cycle routes and the health benefits of walking and cycling.
ii. The location of local bus stops, bus transport routes and frequency of service.
iii. The location of local railway stations, how to access them and key destinations they serve.
iv. In the future should any local car clubs exist, information will be provided on how to use these and where bays are located.

v. Electric vehicle charging point locations.
vi. How to car share.

4.33 The pack will also include the contact details of the Travel Plan Co-ordinator, who will have responsibility for the implementation and on-going work associated with the Travel Plan.

4.34 The individual Travel Plans will identify the measures and ways in which sustainable forms of transport are promoted, encouraged and monitored, with an assessment of what is most appropriate according to the proposed land use, as well as set out timescales for that specific document.

Internal Road Hierarchy

4.35 The road hierarchy shown within the Parameters Plan that forms **Appendix 6** (Option A) and **Appendix 7** (Option B) generally follows the guidance set out in Manual for Streets, Manual for Streets 2 and the Warrington Design Guide. They include as a minimum a 7.3 metre wide local residential distributor road for the main route serving the site.

4.36 A bus gate is used in Option A to prevent a through route, and in Option B a bus gate is proposed to restrict access between Poplars Avenue and the through route to buses only.

4.37 The hierarchy also comprises major and minor residential access roads, shared surface roads, private drives and an industrial access road to serve the employment land.

Constraints

4.38 The constraints on access have been in relation to the following:

i. Where the site accesses can be located and matters arising.

- Frontage available between the site and the public highway.
- Ensuring that good links to existing and new bus routes can be maintained and created.
- Ensuring disruption on the local transport network is minimised.
- Maintaining the provision of on street parking for local residents.
- Protecting the residential area to the south of the site from development traffic.

ii. Changes arising from the public consultation and discussions with the highway authority.

- The access strategy proposals have responded to matters arising from public consultation, such as the suggestion for improved access to Radley Lane south and the stopping up of Radley Lane to motorised vehicles north of the site's distributor road for traffic travelling to/from the south.

- Discussions with the local highway officers have taken place regarding the access junctions and the proposed access strategy has evolved accordingly, such as the proposed junction arrangement of the main site access at Mill Lane, north of the Blackbrook Avenue roundabout, from a priority ghost-right turn junction to a three-arm roundabout.
- The design of the main distributor road through the site has been made to ensure that an accessible route for bus services has been created, with a bus gate proposed to ensure that a through route for general traffic is not created between Poplars Avenue (central) and the distributor road.

Parking Provision

4.39 Car, cycle and motorcycle parking will generally be provided to reflect WBC's Standards for Parking in New Developments (parking standards) published in March 2015. The relevant extracts are contained in **Appendix 23** and set out below.

4.40 Residential parking standards for developments of more than five dwellings outside of the town centre are set out at Table 3 of the guidelines as minimum levels to account for residents and visitors, and states that:

i. One-bedroomed flat to have one allocated space plus 0.3 unallocated spaces.
ii. One-bedroomed houses/two-bedroomed flats to have one allocated space and 0.4 unallocated spaces.
iii. Two-bedroomed houses to have two allocated spaces and 0.2 unallocated spaces.
iv. Three-bedroomed houses/three-bedroomed flats to have two allocated spaces and 0.3 unallocated spaces.
v. Four-bedroom+ houses to have three allocated spaces and 0.3 unallocated spaces.

4.41 Furthermore, Policy PS9 of the parking standards sets out that, *"A minimum of 5% of total unallocated off-street parking spaces within a residential development are to be designated disabled parking. These must be provided in convenient locations"*.

4.42 The standards for various uses are set out at Appendix A, Table 1 of WBC's parking standards, along with a list of other considerations. The parking standards include general car parking, designated disabled spaces, cycle parking and motorcycle parking.

4.43 Policy PS16 states that standard off-street parking bay dimensions are to be provided at 2.5 by 5.0 metres.

4.44 It should be noted that electric vehicle charging points will be provided (or be capable of being retro fitted) to communal parking areas, including the local centre, school and employment area.

5.0 Access Strategy

5.1 There are two access strategies for consideration:

i. A non-through route access strategy, with the development served off six separate access points. This is the strategy that was submitted with the planning application and is referred to as Option A and is shown in the Parameters Plan that forms **Appendix 6**. This access strategy is considered below.
ii. A through route access strategy that connects a new roundabout junction on Mill Lane with the A49 via a new junction on Poplars Avenue. This strategy is referred to as Option B and is shown in the Parameters Plan that forms **Appendix 7**.

Proposed Access Strategy – Option A

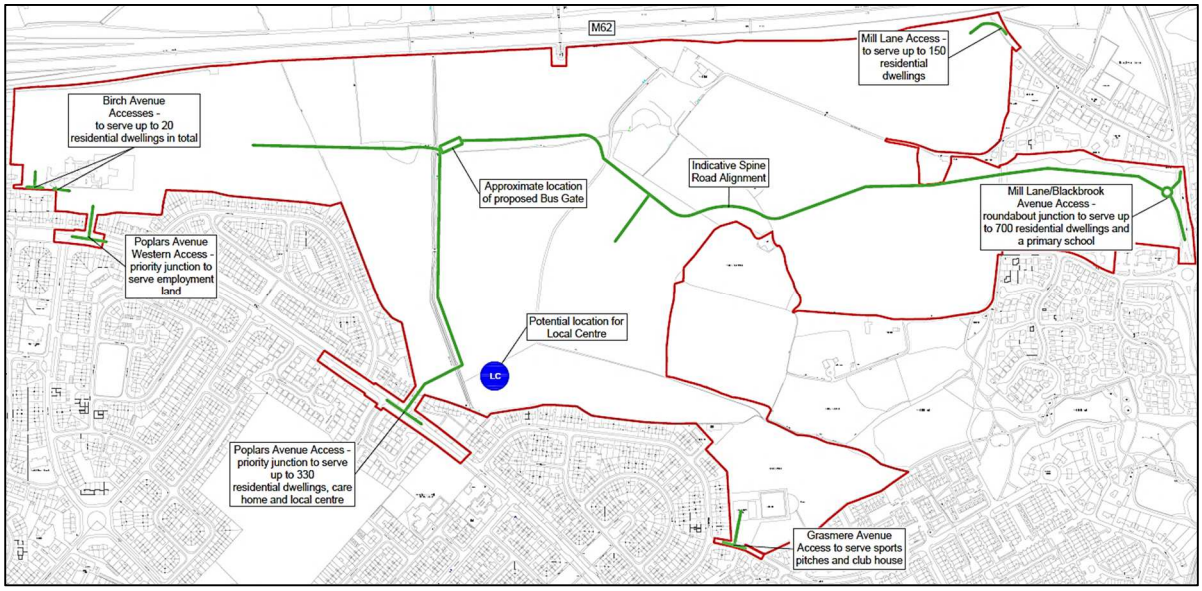
5.2 Under this access strategy the Peel Hall site is proposed to be served from two main access locations serving the majority of the development and four other accesses serving smaller parcels of development. A through route for general traffic is prevented by the introduction of a bus gate on the distributor road as indicated on the Parameters Plan that forms **Appendix 6**.

5.3 Plans of the proposed site access arrangements are contained in the respective appendices and are summarised as follows:

i. A new roundabout on Mill Lane to the north of the existing roundabout junction of Mill Lane and Blackbrook Avenue. This access will serve approximately 700 dwellings and the primary school (**Appendix 24**).
ii. A new priority junction with right turn lane on Poplars Avenue located between Newlands Road and Windermere Avenue. This access will serve approximately 330 dwellings and the local centre (**Appendix 25**).
iii. An extension of Mill Lane into the site. This access will serve approximately 150 dwellings and is generally the same arrangement that was accepted by the inspector at the 2013 appeal (**Appendix 26**).
iv. A new priority junction on Poplars Avenue located between Cotswold Road and Newlands Road. This access will serve the proposed area of employment (**Appendix 27**).
v. An extension of Birch Avenue and a new priority junction. These accesses will serve approximately 20 dwellings (**Appendix 28**).
vi. Improvement works to the existing access on Grasmere Avenue. This access will serve the sports pitches and clubhouse (**Appendix 29**) and facilitates coach access.

5.4 An overview of the proposed internal road network for Option A is shown on the access strategy plan contained in **Appendix 30** and illustrated in **Figure 5.1** below for ease of reference. Furthermore, **Appendix 19** contains the road hierarchy related extracts from the Warrington Design Guide, which were used when developing the illustrative masterplan.

Figure 5.1 – Illustrative internal road layout and site access locations (Option A)



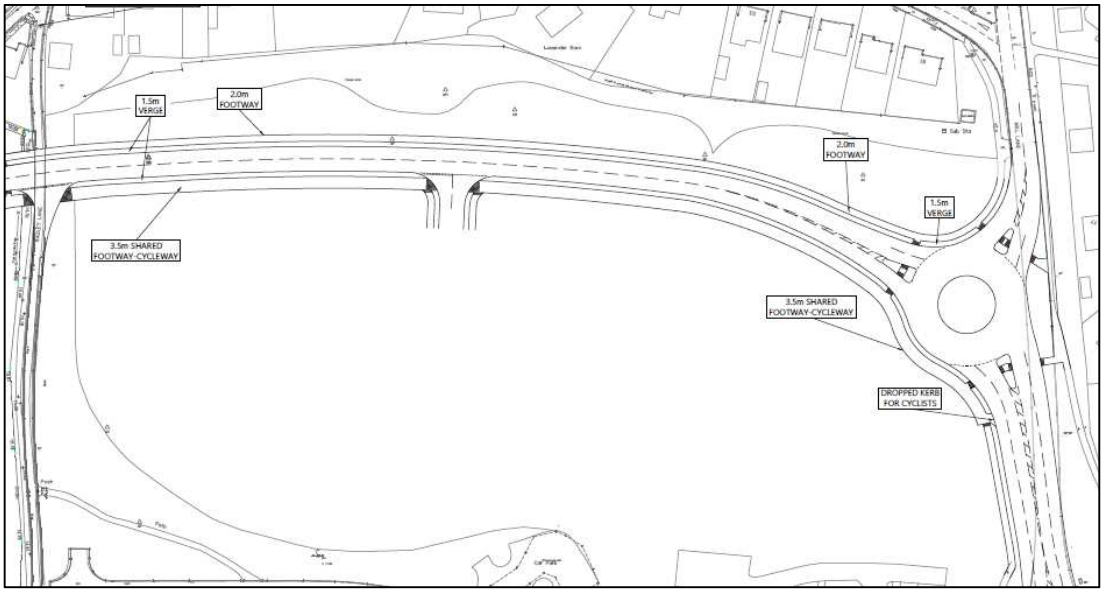
Proposed Site Accesses

5.5 It is proposed that the main vehicular accesses to the development will be from a new access provided on the Mill Lane arm of the Blackbrook Avenue/Ballater Drive/Mill Lane/Enfield Park Road roundabout junction, and from a new access on Poplars Avenue.

5.6 Additional access to specific areas of development will be provided from Mill Lane, Birch Avenue, a second access on Poplars Avenue and one from Grasmere Avenue.

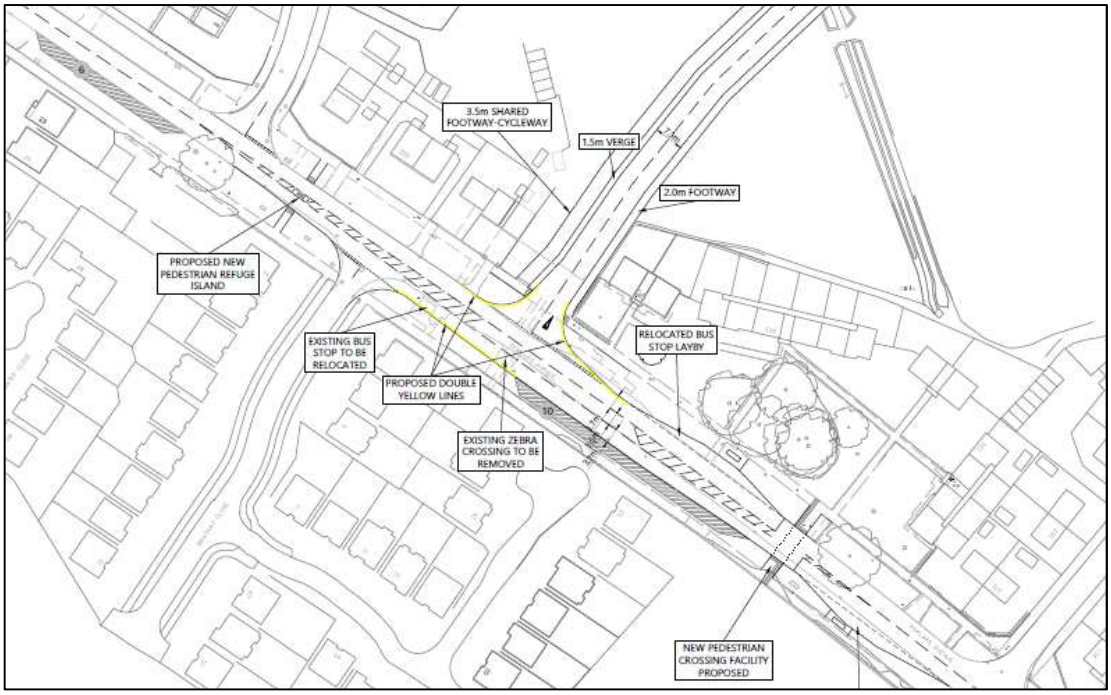
5.7 The plan showing the proposed access from the Mill Lane arm of the Blackbrook Avenue/Ballater Drive roundabout junction forms **Appendix 24**. This access comprises a 7.3 metre wide carriageway from a new 32 metre diameter three-arm roundabout junction and is expected to serve around 700 dwellings. Pedestrian and cycle facilities are provided throughout, which link to the existing network. Swept paths demonstrate that this junction has been designed to accommodate HGV movements. These plans, as well those with visibility splays and the red line boundary are also contained in **Appendix 24**. The proposed access arrangement is illustrated on **Figure 5.2**.

Figure 5.2 – Mill Lane/Blackbrook Avenue proposed access arrangement



5.8 The plan showing the proposed access from the central area of Poplars Avenue, which is located between its junctions with Newhaven Road and Windermere Avenue, is provided in **Appendix 25**. This access comprises a 7.3 metre wide carriageway from a priority junction with ghost right turn lane and associated pedestrian and cycle provision, together with relocated and improved bus stop facilities. It is expected to serve up to 330 dwellings. The proposed access arrangement is illustrated on **Figure 5.3** below.

Figure 5.3 – Poplars Avenue (central) proposed access arrangement



5.9 The creation of formal parking places for 10 cars near the proposed access and six further to the north shown on the plan contained at **Appendix 25** is considered reasonable provision further to on-site observations of existing informal parking.

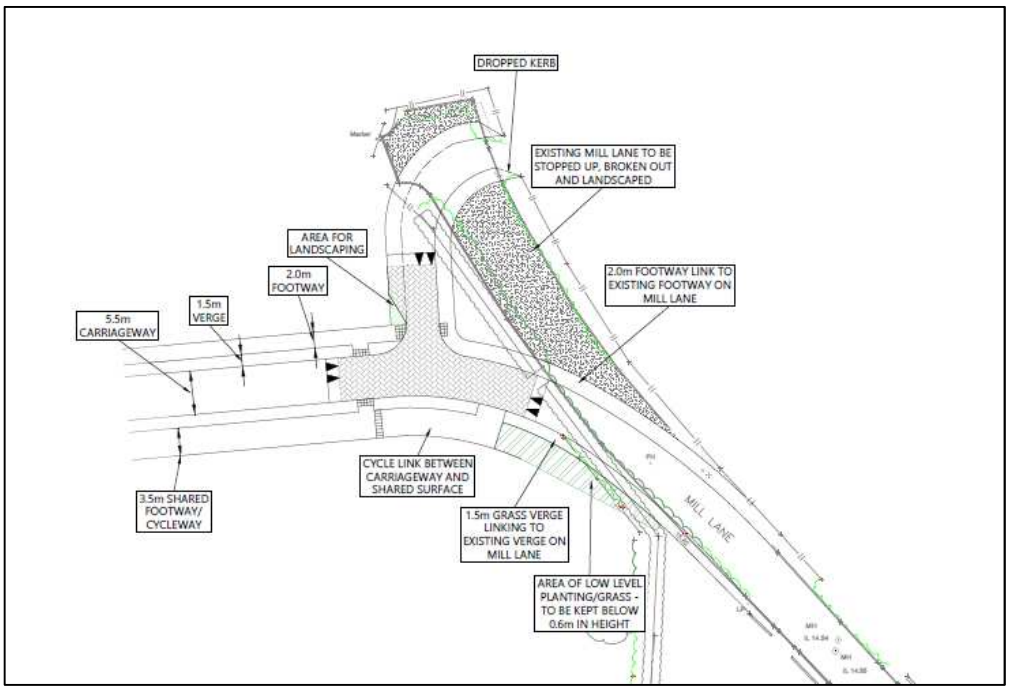
5.10 Swept paths have been carried out for a large vehicle in both through lanes when a large vehicle is positioned in the ghost right turn lane. These are shown to work satisfactorily. Furthermore, forward visibility to signal heads are also shown to be satisfactory. Dimensions shown on plan to assist with review. These plans and the red line boundary plan is contained in **Appendix 25** also.

5.11 The plan showing the proposed extension of Mill Lane into the site, north of the main access junction (see **paragraph 5.5** above) forms **Appendix 26.** This access is expected to serve up to 150 dwellings. It is essentially the same access proposal that was in front of the inspector at the 2013 appeal to serve 150 dwellings and it is appropriate to note her conclusion in paragraph 63 of her report in respect of using Mill Lane for access was:

"*…. the road and footway access would be adequate and the development would not be harmful to highway safety.*"

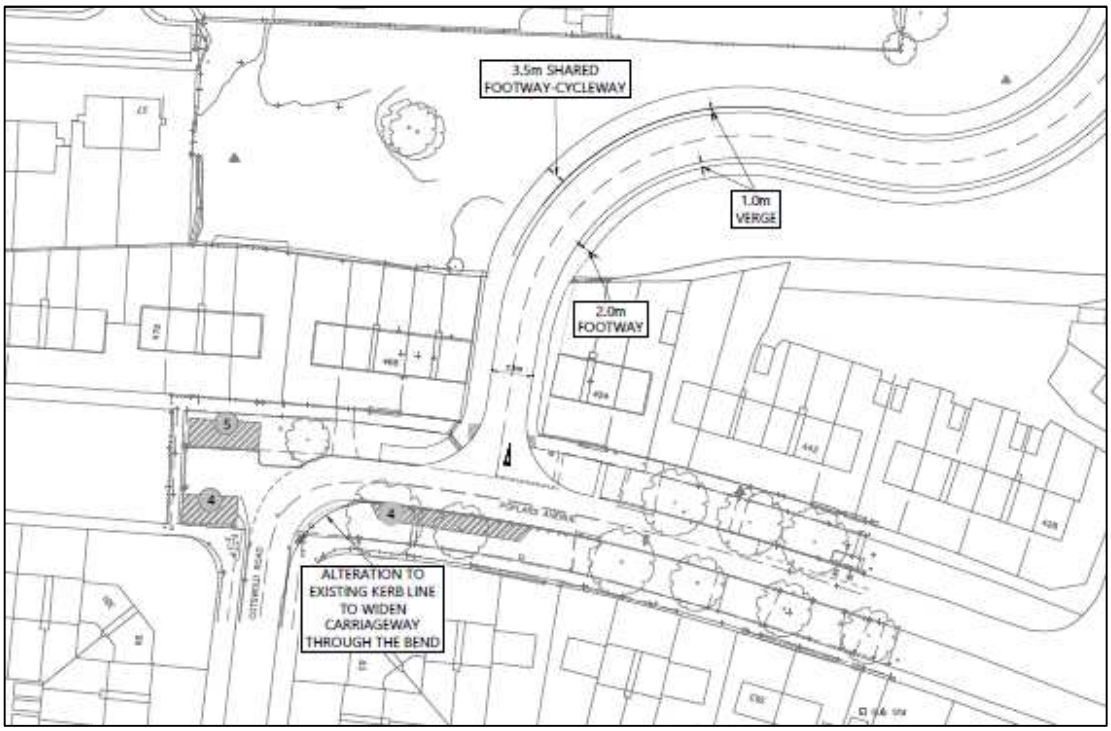
5.12 The design of this access has been further revised to ensure that equestrian vehicles such as a car and horse box can use the access to the existing fields safely and that the raised table proposed will not impact turning movements. Cycle inter-visibility with oncoming cars from Mill Lane is also shown to be appropriate. These plans are also contained in **Appendix 26**. The proposed access arrangement is illustrated on **Figure 5.4** below.

Figure 5.4 – Mill Lane proposed access arrangement



5.13 The plan showing the proposed access from the western section of Poplars Avenue, which is located between its junctions with Cotswold Road and Newhaven Road, forms **Appendix 27**. This access comprises a simple priority junction with a 7.3 metre carriageway and associated pedestrian and cycle facilities and is expected to serve the employment land. This section of Poplars Avenue and Cotswold Road is subject to a 20mph speed limit. The proposed access arrangement is illustrated on **Figure 5.5** below.

Figure 5.5 – Poplars Avenue (west) proposed access arrangement



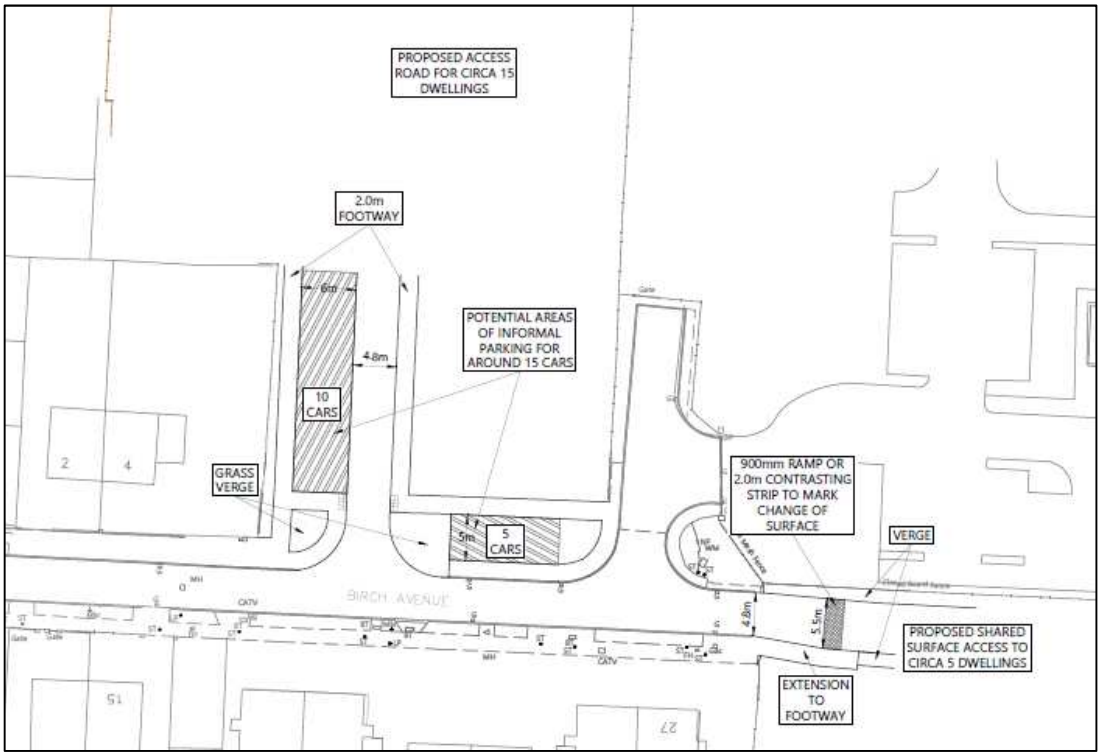
5.14 WBC highway officers set out in their December 2016 (**Appendix 5**) consultation response that visibility was constrained around the existing bend and that speeds would be high and therefore that the bend should be reduced. However, it is widely accepted that constrained visibility leads to lower vehicle speeds. In any event this area is subject to a 20mph speed limit and as such vehicle approach speeds will be low. It should also be noted that the applicant has invited a condition for the employment area to be B1 light industrial with small start-up units; therefore, a large number of HGV movements are not forecast to frequently occur at this site access as a result of the proposed development. This is set out further in **Section 8.0**.

5.15 Visibility splays have been provided on the plan contained in **Appendix 27**, and these are commensurate with a 20mph speed limit. Swept path analysis and red line boundary plans are also contained in **Appendix 27**.

5.16 Furthermore, there is currently no formal parking provision in this location, and the proposals seek to provide 13 spaces off-road. This is seen as a positive enhancement for existing local residents. The plan at **Appendix 27** demonstrates that the parking area created at the stopped-up section of Poplars Avenue will have an 8.0 metre aisle width and 5.0 metre parking bay depths (see the 2016 Road Safety Audit Stage 1 Designers Response at **Appendix 34** for further summary).

5.17 The plan showing the proposed accesses from Birch Avenue forms **Appendix 28**. These accesses comprise a simple priority junction with 4.8 metre wide carriageway and footways to both sides to the west of the Health Centre, and a continuation of the 4.8 metre carriageway along Birch Road to the immediate south of the Health Centre which will expand to a 5.5 metre wide shared surface. Both accesses are expected to serve up to a combined total of 20 dwellings. The proposed access arrangements are illustrated on **Figure 5.6** below.

Figure 5.6 – Birch Avenue proposed access arrangements

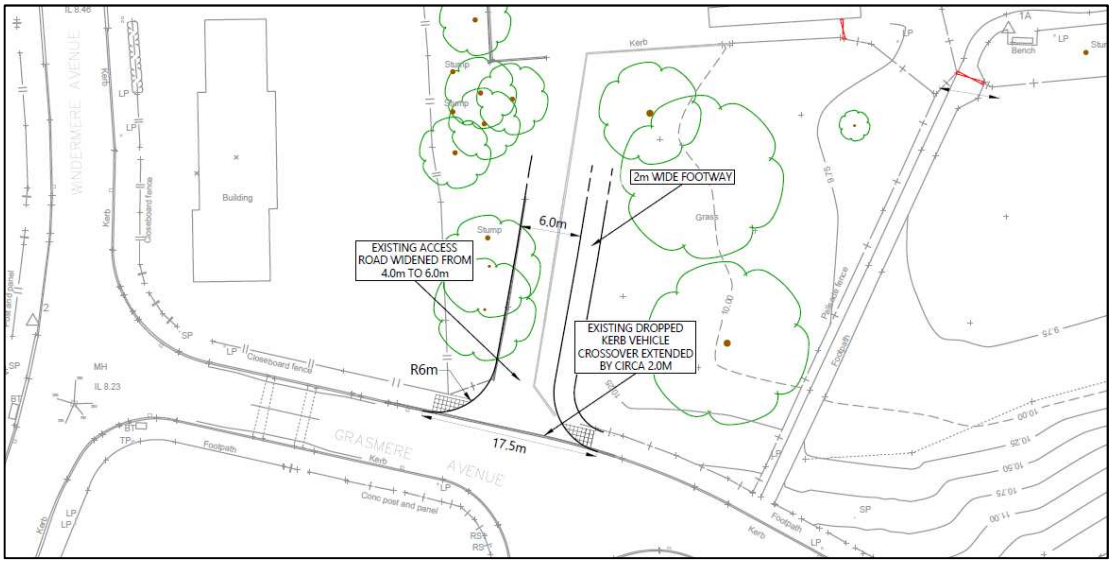


5.18 The applicant (as land owner) currently permits parking on their land adjacent to Birch Avenue; to assist local residents off-road parking will continue to be provided for 10 cars on the new access road to the northern parcel of land. The parking bays will be 6.0 metres in deep and therefore, with a combined depth of the 4.8 metre access road this will accommodate cars manoeuvring, as shown on the swept path analysis contained in **Appendix 28**. Parking bays are also proposed at the access to accommodate five vehicles in the verge area to the immediate east of the proposed northern access.

5.19 The proposed access road is shown as 4.8 metres to match the existing width of Birch Avenue. Birch Avenue is subject to a 20mph speed limit and commensurate visibility splays are shown on the visibility splay plan also contained in **Appendix 28**, which demonstrates that the proposed areas of parking will not obstruct the visibility splays. Red line boundary plans are also provided in **Appendix 28**.

5.20 The plan showing the proposed improvements to the existing access to the enhanced sports pitches from Grasmere Avenue are provided at **Appendix 29**. The proposal is to modify the existing access that serves local recreational facilities to create a 6.0 metre wide access road to facilitate increased traffic movements and coaches, with a 2.0 metre wide footway to facilitate pedestrian access. The proposed access arrangement improvements are illustrated on **Figure 5.7** below.

Figure 5.7 – Grasmere Avenue improved access arrangement



5.21 Swept paths for a coach, a red line boundary plan and visibility splays are provided on the plans contained at **Appendix 29** also.

5.22 Parking is proposed for up to around 75 vehicles off this access, which will be accommodated within a new car park and overflow parking on a grasscrete-type surfaced area, as shown illustratively on **Figure 5.8** below.

Figure 5.8 – Proposed improved provision for sports pitches

Proposed Access to the Local Centre and Car Park – Option A

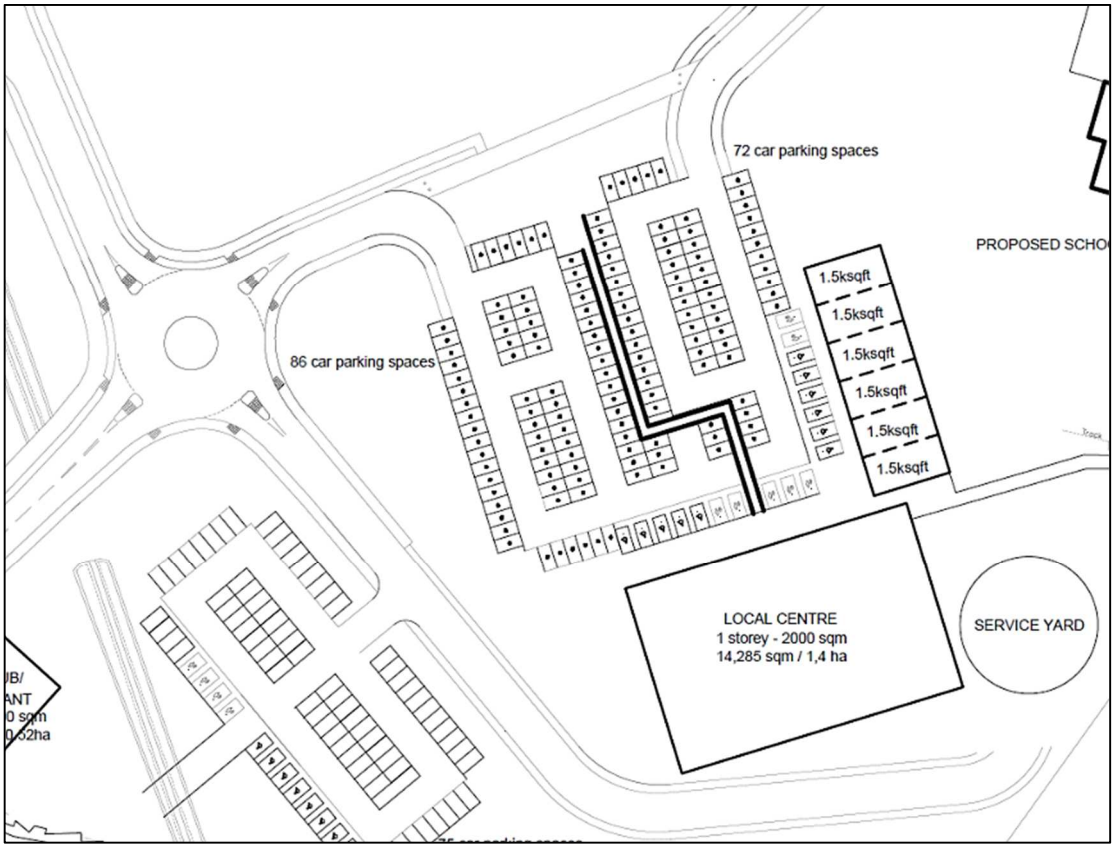
5.23 Because of the introduction of the bus gate on the local distributor road it is important that the local centre car park can be accessed without residents having to leave the development. Consequently, the local centre car park has been designed to be split in two, with two points of vehicular access, but designed so that a through route is not created that could allow traffic to bypass the bus gate on the new local distributor road.

5.24 Therefore, the local centre car park can be accessed from anywhere in the development by car without having to drive on the local highway network; except for the c20 dwellings accessed off Birch Avenue and the northern Mill Lane access serving 150 residential units. All areas of the Peel Hall development will however have pedestrian and cycle facilities inter-linking all parts of the site and out into the wider area, and these links will also facilitate access to the local centre via a bus route.

5.25 The local centre has been proposed in this area in order to provide access by the existing residential area to the south as well as the majority of the Peel Hall site.

5.26 Service yard access for the local centre units and food store will be taken from the Poplars Avenue (central) access. The 7.3 metre service road will route from the associated local centre roundabout, behind the units to the immediate west and south, which also serves the family pub/restaurant (see **Figure 5.9**).

Figure 5.9 – Illustraive local centre car park provision



Proposed Access to the Primary School – Option A

5.27 A roundabout is proposed to serve the school and local centre from the east to facilitate turning for coaches and large buses associated with the school. A drop-off parking zone on the public highway immediately adjacent to the school for around 12 cars will also be provided, and can also be used for coaches to park to serve the school.

5.28 It should be noted that the local centre car park is expected to be used as a drop off facility for the primary school, from both sides, ensuring that car trips are contained within the development, as discussed with highway officers at the meeting in March 2016. See **Figure 5.9** above.

Proposed Access Strategy – Option B (Through Route)

5.29 Under the Option B access strategy, the Peel Hall site is proposed to be served from two main access locations and four other accesses serving smaller parcels of development. The through route will act as a local distributor road between the A49 in the east and Blackbrook Avenue through Mill Lane to the west.

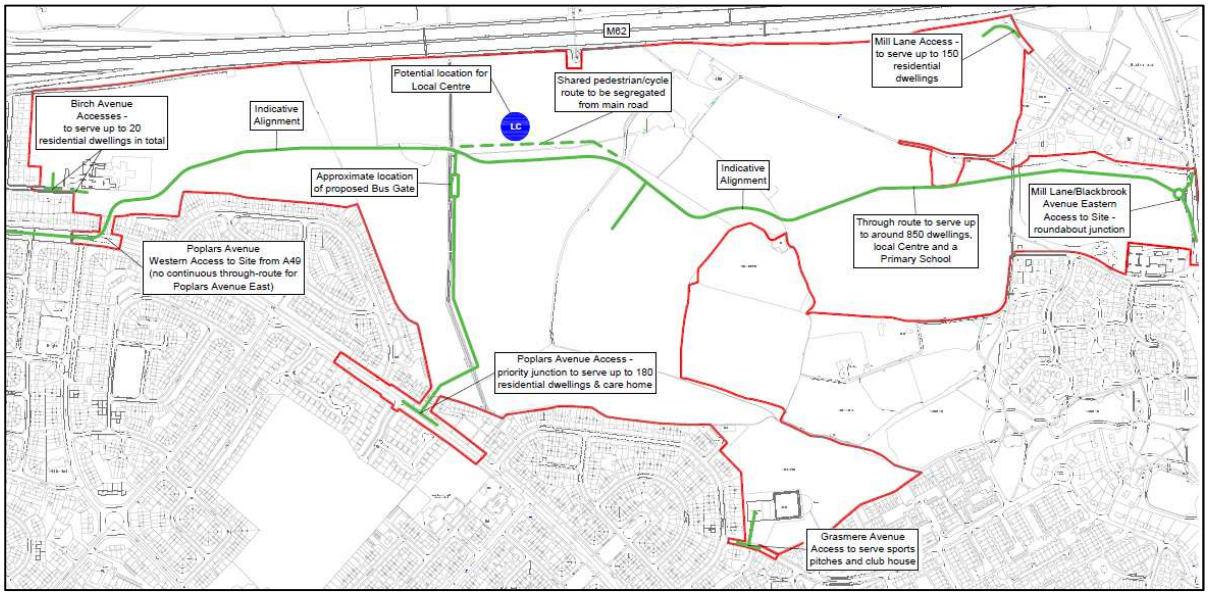
5.30 A through route scenario has been tested as an access option at the request of the WBC highway officers.

5.31 Plans of the proposed site access arrangements can be described as follows:

i. A new roundabout on Mill Lane to the north of the existing roundabout junction of Mill Lane and Blackbrook Avenue. This is the same as Option A.
ii. A new all-movement signalised junction at the A49/Poplars Avenue junction (see **Appendix 32** and **Figure 5.11**).
iii. A new access from the site through to Poplars Avenue located near Cotswold Road. This access has been modified for Option B (see **Appendix 33** and **Figure 5.12**). This forms the western end of the new distributor road through route and would serve circa 850 dwellings with the new roundabout junction onto Mill Lane (point (i) above) and the new signalised junction at the A49/Poplars Avenue (point (ii) above).
iv. A new priority junction with right turn lane on Poplars Avenue located between Newlands Road and Windermere Avenue. This is the same access arrangement as Option A. This will serve around 180 dwellings.
v. An extension of Mill Lane into the site. This access will serve approximately 150 dwellings and is the same arrangement that was accepted by the inspector at the 2013 appeal and is also the same as Option A.
vi. An extension of Birch Avenue and a new priority junction. This access will serve approximately 20 dwellings and is the same as Option A.
vii. Improvement works to the existing access Grasmere Avenue. This access will serve the improved sports pitches and clubhouse, and this is the same as Option A, and facilitates coach access.

5.32 The through route is illustrated in **Figure 5.10** below and the full access strategy plan is contained at **Appendix 33**.

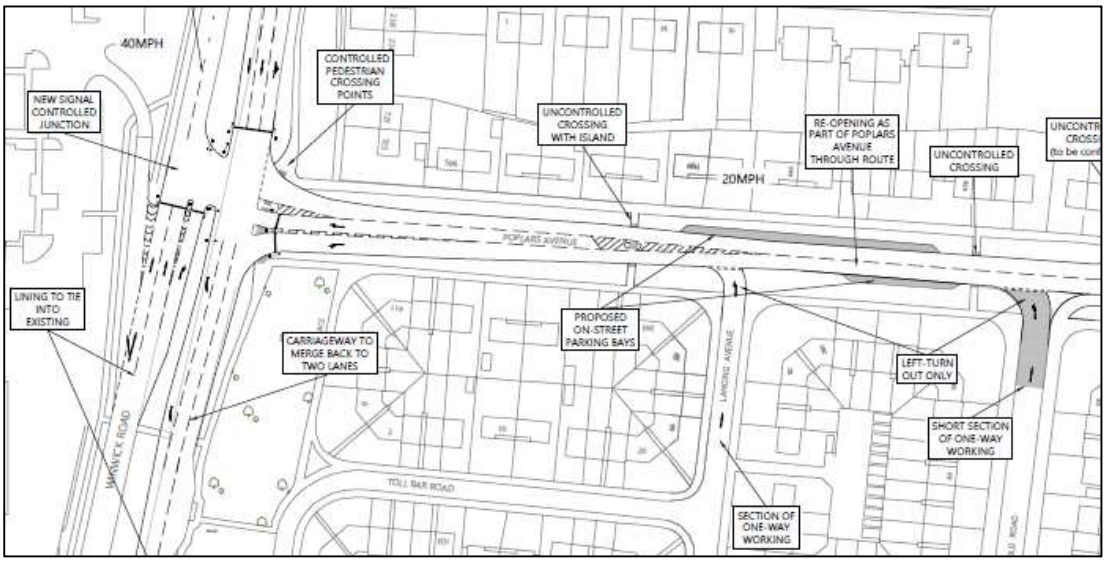
Figure 5.10 – Illustrative internal road layout and site access locations (Option B)



5.33 The through route will require a new all-movement signalised junction with the A49 and for Poplars Avenue to be reopened west of Cotswold Road (east of Lancing Avenue). This will enable traffic from the development to access the A49 without the need to travel through the existing residential area to the south of the site.

5.34 A plan of the proposed signal junction is contained in **Appendix 32**) and an extract is provided in **Figure 5.11** below for ease of reference. This will provide three lanes of stacking for southbound A49 traffic and a merge lane south of the junction.

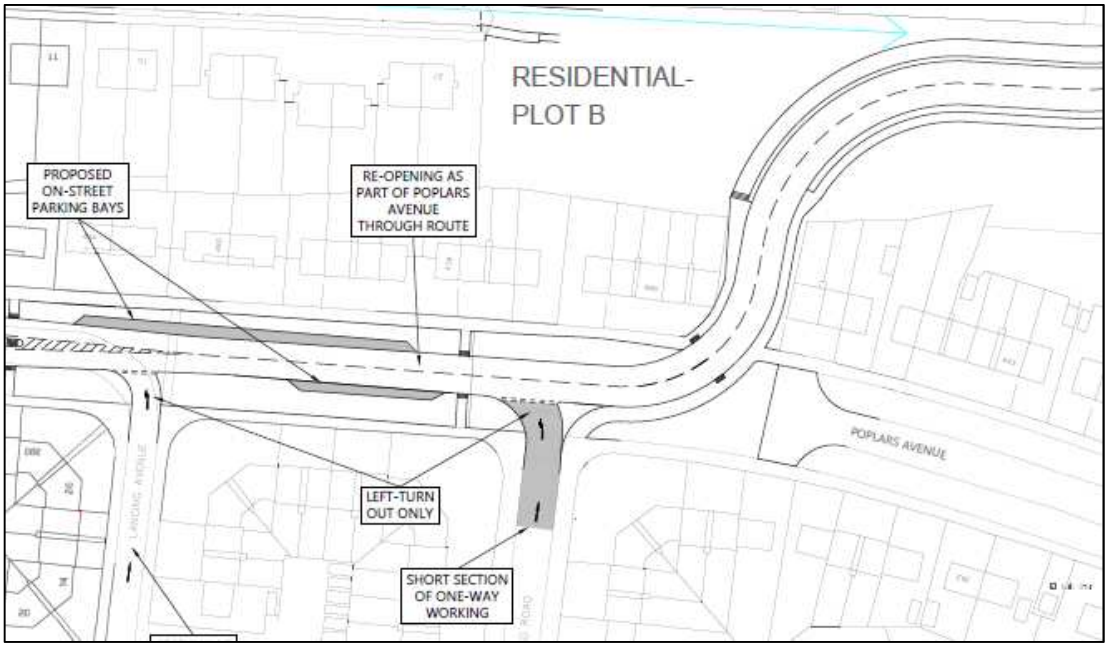
Figure 5.11 – Proposed A49/Poplars Avenue signalised junction (Option B)



5.35 The new signalised junction will enable development traffic to travel north or south on the A49 and for A49 traffic from the north and the south to access the development and travel through the development to the wider highway network east of the site (and vice versa) via the proposed Blackbrook Avenue site access. Further to the Road Safety Audit Stage 1 (January 2018, **Appendix 35**) it has been proposed that modifications such as widening of the standing area and incision of tactile paving could be added to the existing uncontrolled pedestrian crossing to the south of the junction, near the bus stop, to enhance the crossing facility.

5.36 The access to the site from Poplars Avenue West will be a continuation of the Poplars Avenue link with the A49. The alignment will pass through the centre of the site by relocating the bus gate as indicated on the Parameters Plan that forms **Appendix 7**. An extract is provided in **Figure 5.12** below for ease of reference.

Figure 5.12 – Proposed through route alignment at Poplars Avenue (west)



5.37 The through route carriageway will be circa 7.3 metres wide, with a 3.5 metres shared surface footway-cycleway to one side and a 2.0 metre footway to the other side.

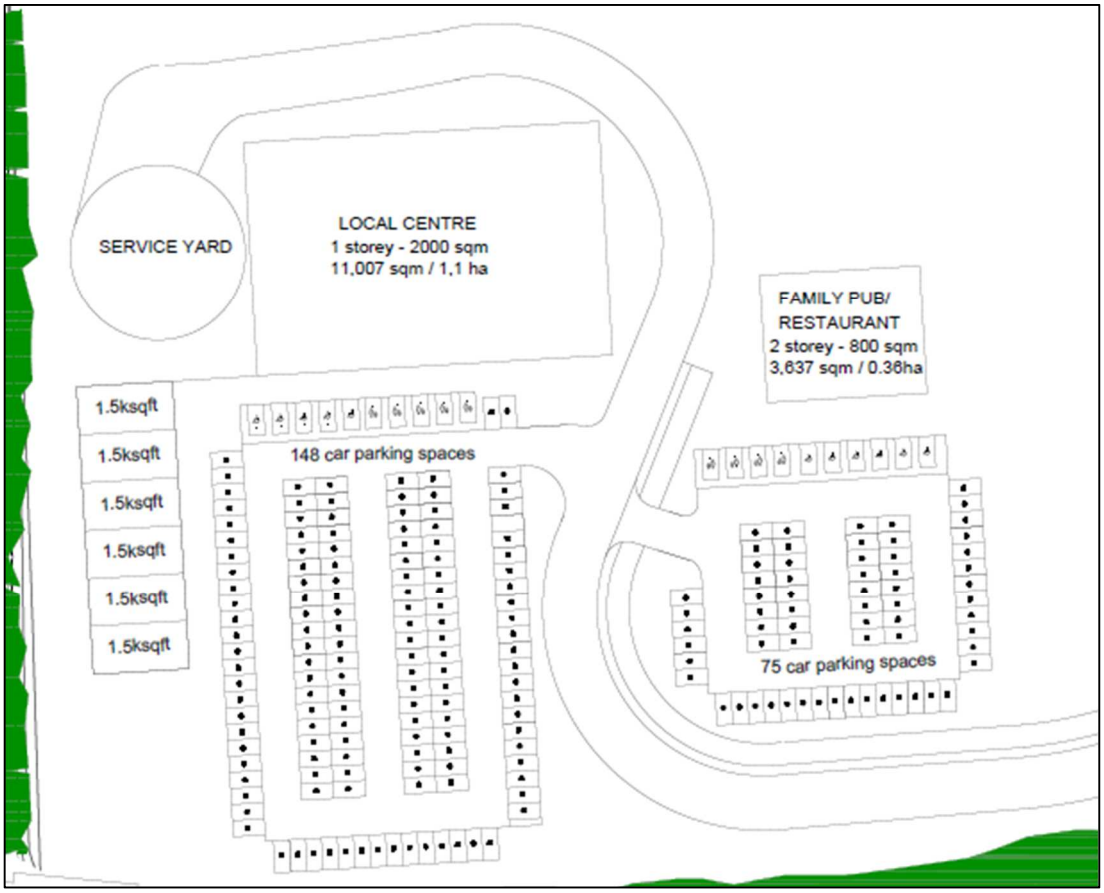
5.38 To ensure that the existing residential areas surrounding the site are protected from development traffic the following measures are proposed:

i. Lancing Avenue one way northbound with a left-turn out only manoeuvre allowed at poplars Avenue.
ii. Cotswold Road one way northbound with a left-turn out only manoeuvre allowed at Poplars Avenue.
iii. Poplars Avenue stopped up west of Cotswold Avenue and the proposed access road.
iv. A bus gate provided to prevent traffic from the development travelling to and from the area of Poplars Avenue to the south (see **Figure 5.1**).

Proposed Access to the Local Centre and Car Park – Option B

5.39 The change in location of the local centre under Option B is directly due to the creation of the through route and is better placed to serve the wider site. Access for pedestrians, cyclists and public transport users remains from the southern areas; around 500 metres and based on a walking speed of 80 metres per minute this is around a six minute walk. An illustrative layout of the local centre under Option B is shown on **Figure 5.13**.

Figure 5.13 – Illustrative local centre access (Option B)



Proposed Access to the Primary School - Option B

5.40 The primary school will continue to be located in the middle of the site. It is proposed that a drop-off car parking arrangement will be provided off the Poplars Avenue (central) access to ensure that no parking occurs on the local existing and proposed residential roads. A drop-off arrangement in this location also avoids the need to travel around the outside of the site thereby reducing car miles travelled.

Road Safety Audit

5.41 All of the proposed Option A access junction arrangements were subject to a Stage 1 Road Safety Audit in 2016, which is contained in **Appendix 34** complete with the Designer's Response.

5.42 Further to the comments received from the WBC highway officer (**Appendix 5**) and those included in the Road Safety Audit, the access junction arrangements were revised (2017), and these and the through route junction onto the A49 at Poplars Avenue have also been subject to a Stage 1 Road Safety Audit (January 2018), which is contained in **Appendix 35**, with the accompanying Designer's Response.

5.43 It can be concluded that the proposed access junction arrangements are appropriate.

6.0 Bus Measures

6.1 Extensive discussions have been held with Network Warrington during 2016 and 2017 concerning how to best serve the Peel Hall development by bus.

6.2 The proposals to ensure high quality access by bus comprise an extension to existing services into the site during the construction phases and the creation of a new service through the site once the distributor road is completed. The locations of the proposed bus stops through the site are shown indicatively on the plan contained in **Appendix 36**, based on an Option A scenario; these would be similar for Access Strategy Option B. There will be one set of lay-bys provided on site for timing purposes, but the other stops will be on-carriageway as discussed with, and requested by, Network Warrington and WBC.

6.3 A phasing program has been set out in the following **Section 7.0** based on year one for first occupation in 2021, with a 10 year build out that finishes in 2030 on the basis of around 120 residential units per year being completed for both Option A and Option B.

6.4 During the first year, residents of the new development will use the existing bus services 20/21 and 23/23A, which have peak period service frequencies of eight to 10 buses per hour for the former to the south of the site, and two buses per hour for the latter to the east of the site.

6.5 During years two to five under Option A, it is proposed that existing services 23/23A will be extended into the site from Enfield Park Road, with temporary turning facilities and bus stops provided as appropriate. Services 23/23A will be extended into the site on weekdays, Saturdays and Sundays in line with the existing level of service (but without a Sunday evening extension). This will be provided through funding additional buses and drivers on this route.

6.6 It is considered that residents located off the Poplars Avenue (central) access will be able to use the existing bus stops at Poplars Avenue as they will be within 400 metres walking distance. **Appendix 16** includes existing timetable information for services 20/21 and 23/23A.

6.7 A new bus service will be introduced in year six to serve the development between Birchwood and Warrington town centre utilising the distributor road and proposed bus stops through the Peel Hall site. This new bus route will provide a comprehensive level of service on weekdays and Saturdays with peak enhancement resulting in a frequency of six buses per hour. A diagram provided by Network Warrington showing the proposed route of the new service, timetable and a summary of the stop locations are contained in **Appendix 37**.

6.8 Under Option B it is expected that the new bus route between Warrington town centre and Birchwood could be running as early as year five, thereby reducing the amount of time the extension to services 23/23A are required.

6.9 The new bus service will continue to run each year and is envisaged to be an attractive and popular route, providing increased modal choice for existing residents travelling eastwards towards Birchwood. The new bus service will also increase capacity of the bus services available between the site and the surrounding area and Warrington town centre to the south, with good frequency, providing access via high quality buses to a number of different services and facilities including schools and further education establishments including the University of Chester Warrington campus in Fernhead, located within 3.0 kilometres east of the centre of the Peel Hall site.

6.10 In summary, the new bus service will assist in creating capacity on the existing transport network by attracting existing residents living close to the route as well as future residents of the Peel Hall site. Thereby ensuring a significant positive benefit to all.

6.11 This service is considered to be an excellent addition to the existing high quality public transport provision serving Warrington.

7.0 Phasing of Development and Construction Traffic

7.1 The Peel Hall site will generate construction traffic throughout its development period and this will have an impact on the local highway network, especially in the immediate vicinity of each site access. In reality each access and associated area of development will have its own timetable and impact, although there will be overlapping.

7.2 It is anticipated at this stage that the development will come forward in over a 10 year period with typically around 120 residential units being constructed each year starting towards the end of 2019/2020 with first occupation in 2021. This was agreed at the meeting in March 2017 with WBC (**Appendix 5**).

7.3 The two separate access strategies, Option A and Option B (through route) require slightly different highway phasing for development traffic, as set out below.

Access Strategy Option A

7.4 **Table 7.1** below sets out indicatively how the development may be phased in terms of highways and the accompanying plan is contained in **Appendix 38**.

7.5 Under this strategy, the sports pitches will be relocated in year one, the local centre and care home will open at the end of year two, the employment land by the end of year three, the primary school will be operational by the end of year eight with the distributor road being completed sufficiently for a temporary new bus service alignment by year six.

Table 7.1 – Indicative highways build out table (Option A)

Year End	Number of Residential Units off Each Access									Indicative Phasing (number of properties sold at year end)
	Distributor Road Blackbrook Ave		Poplars Ave		Mill Lane		Birch Ave		Cumulative Total	
	New	Cum.	New	Cum.	New	Cum.	New	Cum.		
1	60	60	0	0	60	60	0	0	120	1a **60** 1b **60** Relocated sports pitches
2	60	120	40	40	20	80	0	0	240	2a **20** 2b **22** 2c **19** 2d **19** 2e **40** Temporary emergency link to be via Radley Lane (north). Need first part of distributor road from east and turning area for bus service Local Centre and Care Home off Poplars Ave

Table 7.1 continued

Year End	Number of Residential Units off Each Access								Indicative Highways Build Out (number of properties sold at year end)
	Distributor Road Blackbrook Ave		Poplars Ave		Mill Lane		Birch Ave	Cumulative Total	
	New	Cum.	New	Cum.	New	Cum.	New	Cum.	
3	65	185	35	75	0	80	20	20	360	3a **30** 3b **35** 3c **25** 3d **10** 3e **7** 3f **13** Employment Land off Poplars Ave (west) with temporary emergency link through to Elm Walk
4	40	225	40	115	40	120	0	20	480	4a **40** 4b **20** 4c **20** 4d **40** Requires a temporary emergency link through to Peel Cottage Lane

Table 7.1 continued

Year End	Number of Residential Units off Each Access								Indicative Highways Build Out (number of properties sold at year end)
	Distributor Road Blackbrook Ave		Poplars Ave		Mill Lane		Birch Ave	Cumulative Total	
	New	Cum.	New	Cum.	New	Cum.	New	Cum.	
5	60	285	30	145	30	150	0	20	600	5a **30** 5b **11** 5c **19** 5d **30** 5 e **30** Potential for initial bus link through Local Centre and connecting to eastern distributor road Emergency link through Local Centre created
6	95	380	25	170	0	150	0	20	720	6a **45** 6b **50** 6c **25**

Table 7.1 continued

Year End	Number of Residential Units off Each Access								Indicative Highways Build Out (number of properties sold at year end)
	Distributor Road Blackbrook Ave		Poplars Ave		Mill Lane		Birch Ave	Cumulative Total	
	New	Cum.	New	Cum.	New	Cum.	New	Cum.	
7	75	455	45	215	0	150	0	20	840	7a **45** 7b **30** 7c **45** Provision of temporary emergency access through to employment access road
8	100	555	20	235	0	150	0	20	960	8a **50** 8b **30** 8c **20** 8d **20** Primary School Completion of distributor road for full bus service
9	70	625	50	285	0	150	0	20	1,080	9a **59** 9b **22** 9c **39**

Table 7.1 continued

Year End	Number of Residential Units off Each Access									Indicative Highways Build Out (number of properties sold at year end)
	Distributor Road Blackbrook Ave		Poplars Ave		Mill Lane		Birch Ave		Cumulative Total	
	New	Cum.	New	Cum.	New	Cum.	New	Cum.		
10	75	700	45	330	0	150	0	20	1,200	10a **64** 10b **35** 10c **21** Provision of final emergency access through to employment access road

***Subject to detailed phasing plan to be submitted at Reserved Matters stage**

Access Strategy Option B

7.6 **Table 7.2** below sets out indicatively how the development may be phased in terms of highways under Option B, and the accompanying plan is contained in **Appendix 39**.

7.7 Under this strategy, the sports pitches will be relocated in year one, the employment land, care home and local centre by the end of year three, the primary school could be operational by the end of year seven with the distributor road being completed sufficiently for a temporary new bus service alignment by year five.

Table 7.2 – Indicative highways build out table (Option B Through Route)

Year End	Number of Residential Units off Each Access									Indicative Highways Build Out Through Route Option (number of properties sold at year end)
	Distributor Road Blackbrook Ave/A49		Poplars Ave (central)		Mill Lane (N)		Birch Ave		Cumulative Total	
	New	Cum.	New	Cum.	New	Cum.	New	Cum.		
1	60	60	0	0	60	60	0	0	120	1a **60** 1b **60** Relocated sports pitches
2	60	120	40	40	20	80	0	0	240	2a **20** 2b **22** 2c **18** 2d **20** 2e **40** Temporary emergency link to be via Radley Lane (north). First part of distributor road from east and turning area for bus service

Table 7.2 continued

Year End	Number of Residential Units off Each Access								Indicative Highways Build Out (number of properties sold at year end)
	Distributor Road Blackbrook Ave/A49		Poplars Ave (central)		Mill Lane (N)		Birch Ave	Cumulative Total	
	New	Cum.	New	Cum.	New	Cum.	New	Cum.	
3	90	210	10	50	0	80	20	20	360	3a **30** 3b **35** 3c **25** 3d **10** 3e **7** 3f **13** Employment Land off Poplars Ave (west) with emergency link through to Elm Walk, and Local Centre Care Home off Poplars Ave
4	40	250	40	90	40	120	0	20	480	4a **40** 4b **20** 4c **20** 4d **40** Requires a temporary emergency link through to Radley Lane (north)

Table 7.2 continued

Year End	Number of Residential Units off Each Access								Cumulative Total	Indicative Highways Build Out (number of properties sold at year end)
	Distributor Road Blackbrook Ave/A49		Poplars Ave (central)		Mill Lane (N)		Birch Ave			
	New	Cum.	New	Cum.	New	Cum.	New	Cum.		
5	60	310	30	120	30	150	0	20	600	5a **30** 5b **40** 5c **20** 5d **30** Potential for initial bus link through site Emergency link through Local Centre created
6	120	430	0	120	0	150	0	20	720	6a **40** 6b **10** 6c **25** 6d **45**
7	120	550	0	120	0	150	0	20	840	7a **45** 7b 5**0** 7c **25** Primary School Full opening of through route distributor road
8	95	645	25	145	0	150	0	20	960	8a **50** 8b **15** 8c **30** 8d **25**

Table 7.2 continued

Year End	Number of Residential Units off Each Access								Cumulative Total	Indicative Highways Build Out (number of properties sold at year end)
	Distributor Road Blackbrook Ave/A49		Poplars Ave (central)		Mill Lane (N)		Birch Ave			
	New	Cum.	New	Cum.	New	Cum.	New	Cum.		
9	98	743	22	167	0	150	0	20	1,080	9a **59** 9b **22** 9c **25** 9d **14**
10	61	804	59	226	0	150	0	20	1,200	10a **40** 10b **59** 10c **21**

Construction Traffic

7.8 It is intended that most excavated material will be retained on site, however, there will be a need for building materials to be brought to the site. During the construction phase each site access junction is expected to have HGV construction traffic associated with it as set out indicatively in **Table 7.3** for the Option A scenario. It should be noted that there will be an overlap for some phases as construction will take longer than one year, whereas other phases may take less.

Table 7.3 – Anticipated HGV movements/day (Option A)

Year End	Peak HGV Movements/Day					Total Daily HGV
	Residential				Non-Residential	
	Distributor Road Blackbrook Ave	Poplars Ave	Mill Lane	Birch Ave		
1	8	0	8	0	Relocated Sports Pitches = **2**	18
2	8	6	3	0	Local Centre and Care Home off Poplars Ave = **16**	33
3	8	4	0	0 (3 to access via employment land)	Employment Land off Poplars Ave (west) = **8**	23
4	5	5	5	0	-	15
5	8	4	4	0	-	16
6	12	3	0	0	-	15
7	9	6	0	0	Remaining Sports Pitches and Ancillary Facilities = **2**	17
8	13	2	0	0	Primary School = **8**	23
9	9	7	0	0	-	16
10	9	6	0	0	-	15

7.9 A Construction Management Plan will be provided that includes the following details:

i. The timetable of the works.
ii. Daily hours of construction.
iii. Any road closure.
iv. Hours during which delivery and construction traffic will travel to and from the site with such vehicular movements being restricted, unless agreed by the Local

Planning Authority in advance, to between 8.00am and 6.00pm Mondays to Fridays incl.; 9.00am to 1.00pm Saturdays, and no such vehicular movements taking place on Sundays and Bank/Public Holidays.

v. The number and sizes of vehicles visiting the site in connection with the development and the frequency of their visits.
vi. The compound/location where all building materials, finished or unfinished products, parts, crates, packing materials and waste will be stored during the demolition and construction phases.
vii. Areas on-site where delivery vehicles and construction traffic will load or unload building materials, finished or unfinished products, parts, crates, packing materials and waste with confirmation that no construction traffic or delivery vehicles will park on the County highway for loading or unloading purposes, unless prior written agreement has been given by the Local Planning Authority.
viii. Hours during which no construction traffic will be present at the site.
ix. The means of enclosure of the site during construction works.
x. Details of proposals to promote car sharing amongst construction staff in order to limit vehicles accessing the site.
xi. Construction staff vehicles parking off-site.
xii. Wheel washing facilities and obligations.
xiii. Proposed route(s) of all construction traffic exceeding 7.5 tonne.
xiv. Details of the location and amount of construction worker parking.
xv. Photographic evidence of the condition of the adjacent public highway prior to the commencement of any work.
xvi. Emergency contact details for persons responsible for each site.

7.10 HGV construction traffic associated with the Option B scenario is set out indicatively in **Table 7.4** below. As set out above, it should be noted that there will be an overlap for some phases as construction will take longer than one year, whereas other phases may take less.

Table 7.4 – Anticipated HGV movements/day (Option B)

Year End	Peak HGV Movements/Day					Total Daily HGV
	Residential				Non-Residential	
	Distributor Road Blackbrook Ave	Poplars Ave	Mill Lane	Birch Ave		
1	8	0	8	0	Relocated Sports Pitches = **2**	18
2	8	8	3	0	-	19
3	10	1	0	0 (3 to access via employment land)	Employment Land off Poplars Ave (west) and Local Centre, and Care Home off poplars Avenue = **24**	38
4	5	5	5	0	-	15
5	8	4	4	0	-	16
6	16	0	0	0	Remaining Sports Pitches and Ancillary Facilities = **2**	18
7	16	0	0	0	Primary School = **8**	24
8	14	3	0	0	-	17
9	14	3	0	0	-	17
10	8	8	0	0	**-**	16

8.0 Development Trip Generation and Discounting

8.1 This Transport Assessment considers all modes of transport and the demands that the proposed development will place on the existing transport infrastructure.

8.2 A vehicular trip generation and attraction assessment has been carried out for the proposed development based on the development profile set out in **paragraph 4.6**, using multi-modal TRICS surveys.

8.3 The trip generation assessment has been carried out generally mirroring the Omega approach, as requested in 2016 by WBC and HE. If anything, the Peel Hall trip rates are more robust, with the privately-owned housing residential trip rates covering all tenure houses and apartments as well as retirement accommodation.

8.4 The number of development trips associated with each use and each access was calculated using the TRICS database in 2016. These rates were set out in detail in Technical Notes HTp 1107 series of reports TN/02/A, TN/02/A/Addendum, TN/06 and TN/12 that have previously been provided to WBC highway officers. The trip rate tables are provided in this section of the report and the TRICS output reports are contained in **Appendix 40** for ease of reference.

8.5 The trip rates, discounting and distribution (**Section 9.0**) have been provided and reviewed further to WBC's consultation response (**Appendix 5**), various meetings held with WBC and HE between January 2016 and March 2017 and correspondence since January 2016 regarding the highways and transportation elements of the scheme.

8.6 It should be noted that 85th percentile trip rates are not available for every use class, but in our judgement what has been used is robust and more so than the Omega approach previously accepted by WBC. 85th percentile rates are only available for residential use, which is the predominant use proposed in any event. Nevertheless, it should be noted that the TRICS database is owned and run by a consortium of councils and is therefore is a reliable and properly managed dataset, which is subject to an appropriate level of scrutiny. The selection process provides an accurate and reliable average trip rate for developments across the country. If the 85% percentile trip rates were relied upon for all land uses, particularly for a site as large as Peel Hall and with a mixed-use profile, this would represent an unreasonable and significant overestimate of the likely development impact on the highway network; pushing up the burden of highway infrastructure improvement costs onto the developer. Furthermore, this mixed-use site and the excellent bus service proposed will reduce car trips, therefore minimising the impact of development traffic on the local and wider highway network.

8.7 The residential and care home trip rates mirror that agreed for use within the Omega application. However, higher trip rates for the food store were used in the Peel Hall assessment than compared to the Omega application.

8.8 Furthermore, although average trip rates were used for the B1(c) land uses, sensitivity tests were carried out (as set out below) and the highest rates subsequently used. It is therefore considered that a robust approach has been adopted to forecast development traffic.

8.9 Many of the vehicular trips will be contained within the development and will not impact on the wider transport network due to the inclusion, location and accessibility of the local centre and food store facilities as well as the primary school. As previously set out (**Section 5.0**), the local centre car park has been designed to be split in two, with two points of vehicular access (Option A), but designed so that a through route is not created that could allow traffic to bypass the bus gate on the new local distributor road. Therefore, the local centre car park can be accessed from within the development by car without having to drive on the local highway network under the Option A scenario.

8.10 For the purposes of the traffic assessments the peak hour has been taken as 0800-0900 and 1700-1800, with peak periods of 0700-0930 and 1600-1830 used in the VISSIM modelling, which were subsequently transferred to the SATURN model. This has previously been agreed with highway officers at WBC and HE. The peak period trip rates report 1107/TN/02/A/Addendum is contained in **Appendix 41** for reference, and an updated extract for the family pub/restaurant is set out in **paragraphs 8.43** to **8.45** further to the change in GFA of this proposed land use, which was contained in HTp report 1107/TN/12 (see **Appendix 42**).

8.11 Following the trip rate tables in this section of the report, each of the access strategy options will be set out in terms of trip loading at each access point.

8.12 Trip discounting and sensitivity tests (i.e. M62 test) are set out in this section, along with the development trips for an intermediate assessment year of 2025 (with a phased build out) and an end year of 2030 (full build out). Saturday and Sunday trips are also discussed, further to the peak hour traffic flow review set out in **Section 3.0.**

8.13 The resultant development trips have been reflected in the SATURN modelling carried out by AECOM.

Trip Rates – Residential, Care Home and Employment

8.14 It was agreed with WBC at the March 2016 meeting (**Appendix 4**) that the starting point for trip rates was to follow those trips rates set out in the AECOM technical note for the Omega South application (extract provided in **Appendix 43**).

8.15 The trips rates used for assessing the impact of the Peel Hall development have previously been set out in HTp 1107 Technical Notes TN/02/A (March 2016, **Appendix 44**) and TN/12 (April 2016, **Appendix 42**). These trip rates were collated in TN/13 (July 2016, **Appendix 45**).

8.16 A summary of the peak hour trip rate data for the Peel Hall development and the resultant trips for each land use are set out below (taken from 1107/TN/02/A, **Appendix 44**).

8.17 The residential trip rates mirror those agreed by WBC from the AECOM review of the Omega residential trip rates inserted into the HE's VISSIM model, and these are set out below in **Table 8.1** for the proposed 1,200 residential dwellings.

Table 8.1 – Residential vehicular trip rate and generation summary

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
85th Percentile Trip Rates (per unit)	0.225	0.523	0.495	0.307
Residential Trips (1,200 units)	270	628	594	368

8.18 Within the 1,200 dwellings proposed there will be up to 60 retirement apartments, which have significantly lower weekday peak hour trip rates than those set out in **Table 8.1** above. It should be noted that no allowance has been made for this discount within these trip rate calculations.

8.19 Residential apartments and social housing will also make up a proportion of the 1,200 dwellings proposed on site. No discount has been made to reflect this.

8.20 Therefore, it is considered that this approach is robust and gives confidence to the overall figures used in the assessment.

8.21 The care home trip rates also mirror those agreed by WBC used in the Omega Transport Assessment that were inserted into the VISSIM model. An extract of the AECOM technical note containing these trip rates is contained in **Appendix 43**. The resultant trip rates for a 100-bedroomed care home are set out in **Table 8.2** below.

Table 8.2 – Care Home vehicular trip rates and attraction summary

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Trip Rates (per bedroom)	0.068	0.068	0.083	0.113
Care Home Trips (100-beds)	7	7	8	8

8.22 It is considered that this approach is suitable and as these trip rates mirror that set out in the Omega assessment, gives confidence to the overall figures used in the assessment.

8.23 It is proposed that the development scheme will include an employment zone of up to around 7,500sqm GFA of B1(c) light industry.

8.24 TRICS has been used to provide an indication of the number of AM and PM peak hour vehicular that are likely to be attracted by an employment zone of this size.

8.25 An assessment was first made in early 2016 using the TRICS 7.2.4 database for B1(c) Industrial Units; TRICS Land Use Code 02/C highlighted for B1(c) land classifications. The dataset was reviewed based on multi-modal surveys from sites within England, on weekdays for up to 10,000sqm GFA. Sites within Greater London were excluded at that time due to their unrepresentative trip rate as a result of greater public transport opportunities. Sites within suburban and edge of town locations were available. Four of these sites were then manually removed from the dataset as they did not contain operations classed as B1(c) land uses. This returned two surveys and the trip rates demonstrate that 22 arrivals and 11 departures in the AM peak hour and 4 arrivals and 25 departures in the PM peak hour may result from a development of 7,500sqm GFA. The TRICS data is contained at **Appendix 40**.

8.26 A sensitivity test of all surveys within TRICS for this category was then carried out, excluding those in Greater London. This returned five surveys but there was negligible difference between the two sets of average trip rates.

8.27 However, it was considered that these trip rates could be too low for the proposed development at Peel Hall if, for example, there were 75 units of 100sqm GFA operating as starter-type units, and so a further sensitivity test was carried out.

8.28 The TRICS 7.2.4 database was next interrogated for surveys of B1(c) units within Industrial Estates; TRICS Land Use Code 02/D. The dataset was reviewed based on multi-modal surveys from sites within England, on weekdays for up to 10,000sqm GFA. Sites within Greater London were again excluded. An Edge of Town Centre site was manually excluded based on the conflict of location between this and the Edge of Town setting.

8.29 Further to this, three sites were also manually removed from the dataset as they did not contain operations classed as B1(c) land uses, and another four sites were removed as they only had very low proportions of B1(c) activity on site (i.e. B8 with generally much lower trip rates per square metre GFA). This returned four surveys. Due to the range of sites available within the TRICS database for this land use category, 85th percentile figures were not able to be assessed.

8.30 A sensitivity test of all surveys within TRICS for this category (02/D) was then carried out, excluding those in Greater London, which returned exactly the same survey results.

8.31 The average trip rate data for industrial estates of B1(c) land uses from the search identified in **paragraph 8.25** above is summarised in **Table 8.3** below and the TRICS data is contained at **Appendix 40**.

Table 8.3 – Employment vehicular trip rates and attraction summary

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Trip Rates (per 100sqm GFA)	0.919	0.514	0.260	0.621
Employment Trips (7,500sqm GFA)	69	39	20	47
HGV %Proportion	7%	10%	10%	4%

8.32 In terms of **Table 8.3** above, the use of B1(c) trip rates has been further substantiated in HTp Technical Note response to HE Review 1107/TN/13, which is contained in **Appendix 45** for reference. It should be noted that the developer would be prepared to accept a planning condition restricting the land use to B1(c) activities to ensure suitability with the location next to existing and proposed housing.

8.33 The level of interrogation on the TRICS database to find specific sites to mirror the proposed development has led to a robust assessment of potential impact of the employment land use and this gives confidence to the overall figures used in the assessment.

Trip Rates – Neighbourhood Centre

8.34 The proposed development will include a neighbourhood centre comprising a food store of up to 2,000sqm GFA, plus up to a further 600sqm GFA of local centre type facilities as well as a family pub and restaurant facility of up to 800sqm GFA.

8.35 A comparison was previously carried out between the trip rates from the Discount Food Stores category (01/C) within the TRICS 7.2.4 database and the generic food stores (Food Superstore 01/A) category. It should be noted that the sub land use category of 'Superstore' is misleading as the dataset includes stores from 800sqm to 12,642sqm GFA (for surveys carried out between 01/01/07 and 29/11/14 across the whole of the UK).

8.36 The peak hour trip rates from the Discount Food Stores dataset are set out in **Table 8.4** below, based on all weekday multi-modal surveys of sites within England, excluding Greater London, in Suburban Areas, Edge of Town and Neighbourhood Centre locations. Due to the low number of surveys returned, 85th percentile data was not reliable and so the average dataset has been used. The resultant TRICS report is contained in Appendix 4 of 1107/TN/02/A (**Appendix 44**). It should be noted that these trip rates are mirrored in the AECOM technical note as those used within the Omega Transport Assessment and subsequent VISSIM modelling; an extract of which can be found in **Appendix 43** for reference.

Table 8.4 – Discount food store vehicular trip rate and generation summary

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Trip Rates (per 100sqm GFA)	0.660	0.321	2.799	3.280
Discount Food Store Trips (2,000sqm GFA)	14	7	56	66

8.37 It was considered that the trip rates set out in **Table 8.4** above were too low. Therefore, further to discussions with the highway officers following the March 2016 meeting (see **Appendix 4**), the peak hour trip rates and generation from the TRICS Food Superstores dataset are set out in **Table 8.5** below; based on all weekday multi-modal surveys of sites within England, excluding Greater London, in Suburban Areas and Edge of Town locations. Again, due to the low number of surveys returned, 85th percentile data was not reliable and so the average dataset has been used. The TRICS data is also contained in **Appendix 40**.

Table 8.5 – Food store vehicular trip rate and attraction summary

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Trip Rates (per 100sqm GFA)	4.615	3.030	9.056	9.550
Food Store Trips (2,000sqm GFA)	92	61	181	191

8.38 As a sensitivity test, TRICS was also interrogated for all multi-modal site surveys within the UK-wide Food Superstore dataset, using the same parameters as set out in **paragraph 8.37**. This returned one additional site in the Isle of Anglesey which slightly reduced the average trip rates shown in **Table 8.5**. Therefore, although the lower discount food store trip rate figures have been agreed for use by Omega in their modelling for the same sized store (2,000sqm GFA), we have used the higher trip rate figures set out in **Table 8.5** to reflect a robust approach and give confidence to the overall figures used in the assessment.

8.39 The proposed development includes a 600 square metre GFA local centre. The local centre may be comprised of, for example, a chemist, dry cleaners, estate agent, take-away, café and/or health care facilities.

8.40 TRICS was again used to provide an indication of the number of AM and PM peak hour vehicular that are likely to be attracted by a local centre of this size, based on the category 'local shops' for all sites within England, with multi-modal weekday surveys, for Suburban Area, Edge of Town and Neighbourhood Centre locations. Average trip rates were used due to the survey sample size available.

8.41 Sites within Greater London were excluded due to their unrepresentative trip rate as a result of greater public transport opportunities. The full TRICS reports are contained in **Appendix 40** to this report, and the peak hour vehicular trip rates and generation for the local centre are set out in **Table 8.6**.

Table 8.6 – Local centre vehicular trip rate and attraction summary

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Trip Rates (per 100sqm GFA)	5.025	4.780	6.039	6.495
Local Centre Trips (600sqm GFA)	30	29	36	39

8.42 It is considered that this approach is suitable.

8.43 The size of the proposed family pub/restaurant was changed in April 2016 as the scheme evolved, reducing to 800sqm GFA. The change in floor area was set out in Technical Note 1107/TN/12 (**Appendix 41**) and the resulting trips are represented in **Table 8.7** below.

Table 8.7 – Family pub/restaurant vehicular trip rate and attraction summary

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Trip Rates (per 100sqm GFA)	-	-	2.847	1.845
Family Pub/Restaurant Trips (800sqm GFA)	-	-	23	15

8.44 For reference the peak period trip rates and trip generation figures for the revised family pub/restaurant GFA of 800sqm is set out in **Table 8.8** below, taken from HTp/1107/TN/12 (**Appendix 41**). This supersedes the data for a family pub/restaurant contained in HTp Technical Note on peak period trip rates 1107/TN/02/A/Addendum (**Appendix 41**).

Table 8.8 – Family pub/restaurant (800sqm)

Hour	Trip Rates (per 100sqm)		Trips	
	Arrival	Departure	Arrival	Departure
1600-1700	1.828	1.195	15	10
1700-1800	2.847	1.845	23	15
1800-1900	3.023	2.513	24	20
1800-1830*	*1.512*	1.257	*12*	*10*

8.45 It is considered that this approach is fair and reasonable given the location of the family pub/restaurant in each development scenario (Option A and Option B).

Trip Rates – Primary School

8.46 The proposed development scheme includes for up to a two-form entry new primary school, which could have up to around 420 pupils. The proposed primary school is not intended as a replacement educational establishment.

8.47 From previous discussions with WBC the indication is that the development of 1,200 houses would result in a demand for around 360 primary school places. This Transport Assessment will therefore assume that 360 places from the on-site 420 primary school intake would come from within the proposed development, with the remaining 60 pupil places being made-up from those residents living within the area of Poplars and Hulme immediately surrounding the site.

8.48 TRICS has been used to provide an indication of the number of AM and PM peak hour vehicular trips that are likely to be attracted by a primary school on this site, and an assessment has been made from the TRICS 7.2.4 database based on average data, due to the number of surveys available. The data sets were reviewed based on multi-modal surveys from sites within England for primary schools with up to 450 pupils, on weekdays. The actual range of pupil numbers for the schools surveyed was between 147 and 414.

8.49 The location types returned were Suburban Area, Edge of Town and Neighbourhood Centre. The Edge of Town Centre survey location was discounted in accordance with the TRICS Good Practice Guide due to its conflict in location type with Neighbourhood Centre. The full TRICS reports are contained in **Appendix 40** to this report.

8.50 The peak hour vehicular trip rates and generation for the primary school are set out in **Table 8.9**.

Table 8.9 – Primary school vehicular trip rate and attraction summary

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Trip Rates (per pupil)	0.269	0.189	0.045	0.063
Primary School Trips (all 420 pupils)	113	79	19	27

8.51 The school has been included in the assessment as a two-form entry and as 100% of the residential trips are used on the external highway network in this assessment, it is therefore considered that this approach is robust and gives confidence to the overall figures used in the assessment.

Trip Rates – Sports Pitches

8.52 The proposed development at Peel Hall will include the existing open space and local authority community buildings and sports area on the land off Windermere Avenue and Grasmere Avenue to the southeast of the site. This will be linked to the site and new sports pitches will be provided to replace those currently located on the HCA land to the east of the site, off Mill Lane. It is confirmed that the existing playing fields at Mill Lane are to be moved and provided on a like for like basis in terms of number of pitches and site area in the southern part of the site.

8.53 This relocation will be provided to a higher standard than the current provision, with enhancements such as the addition of changing facilities and improved drainage, and will be linked to the improved provision on the council owned Radley Common recreation area at Windermere Avenue

8.54 The new facilities will likely include full-sized grass pitches, a multi-use games area, junior grass pitches and changing facilities for up to four teams. The expectation is that these proposals will also include a clubhouse/function room for community use.

8.55 The sports pitches will predominantly be used at the weekends and it was agreed at the 2013 Public Inquiry (Appeal ref: APP/M0655/A/13/2192076) that this element of the development proposals would not need to be included within the weekday modelling. Furthermore, there will be an offset in trip generation from the current on-site uses at the existing location and from the sports pitches on the HCA land, which are to be relocated.

8.56 It is likely that the proposed clubhouse facilities will be used by the local community, for example, by a mother and toddler group, and also that the sports pitches may be used during the evening after 1800 hours. Therefore, it was agreed at the 2013 Inquiry that the clubhouse facilities for local community use may attract up to 15 car movements over two-hour time slots during the day between the hours of 0900 and 1800. As this is cannot be accurately modelled within our one hour peak AM and PM time periods, the 15 movements have been concentrated into each peak hour. This is set out on **Table 8.10** below.

Table 8.10 – Sports pitches and ancillary facilities vehicular trip rate and attraction summary

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Community Use Trips	10	5	7	8

8.57 This approach has been agreed by the previous inspector and therefore it is considered that this approach is suitable and gives confidence to the overall figures used in the assessment.

Summary

8.58 The vehicle trips associated with each land use are tabulated below for ease of reference in **Table 8.11**. Please note that no trip discount has been applied to these figures.

Table 8.11 – Peel Hall vehicular trip generation summary (no discounts applied)

Development Traffic	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Residential Trips	270	628	594	368
Care Home Trips	7	7	8	8
Employment Trips*	69	39	20	47
Food Store Trips**	92	61	181	191
Local Centre Shop Trips	30	29	36	39
Family Pub/Restaurant Trips	-	-	23	15
Primary School Trips	113	79	19	27
Community Uses	10	5	7	8
Total Trips	**591**	**848**	**888**	**703**

**** See Table 8.3 for HGV proportion of peak hour traffic***
***** Reference Table 8.5 for avoidance of doubt***

8.59 In summary, there could be up to around 1,591 vehicle trips on the local highway network associated with the Peel Hall development in the busiest peak hour when considering the development overall if no discounting were to be applied, and not taking into account Travel Plan measures, the proposed bus mitigation and trips contained within the site itself. It should be noted that internal connectivity for sustainable travel modes i.e. walking, cycling and bus travel is shown within the Parameters Plans and would be secured through future reserved matters applications. This will provide excellent connectivity for all sustainable modes of travel.

M62 – Trip Discounting Sensitivity Test

8.60 Following the receipt of the 2016 WBC consultation response (**Appendix 5**) and a meeting with HE in January 2017 (**Appendix 4**), it was decided to provide an assessment of the previously proposed trip rate discounts of residential 20%; food store 60%; local centre 70%; primary school 75% AM (50% PM); family pub/restaurant (25% PM) compared to a new approach, which was subsequently adopted, of accounting for 100% of the residential trips and discounting the following only:

i. Food store 70% discounted and 30% pass-by trips to mirror the Omega approach.

ii. Primary school 50% discount in both peaks only.
iii. Local centre 100% discounted to mirror the agreed Omega approach.
iv. Family pub 0% discounted.

8.61 Our summary report provided to HE for review, HTp Technical Note 1107/TN/15 (contained in **Appendix 46**), also provided a summary on the impact of the Peel Hall development on the M62 network.

8.62 From this is was concluded that there was no material difference in trip rate reduction strategy. However as set out above, the discounting for development trips taken forward with the SATURN model has been based on the preference of highway officers at WBC for 0% reduction in residential trips.

8.63 It was also concluded from the VISSIM modelling at that time that the actual level of development vehicular trips on the M62 network north of the Peel Hall site is shown to be relatively low in the AM peak hour, with up to around 50 vehicular trips, which was considered to be within the daily variation of flow on the M62 and Junction 9 and Junction 10 of the M62. Furthermore, it was shown that there may be up to around 120 vehicular trips on the M62 as a result of the Peel Hall development in the PM peak hour, which is around an additional two vehicles per minute. This is not considered to constitute a severe impact.

8.64 The next part of this section will review the access strategies and set out in more detail the level of discounting for vehicular trips that was adopted.

Access Strategy - Option A

8.65 The access strategy for Option A has not changed from that previously set out, in that whilst the whole site will be fully permeable for pedestrians and cyclists the parcels of land for residential development correspond directly to a single point of vehicular access only. This is set out in **Table 8.12** below and on the access strategy plan contained in **Appendix 30**.

Table 8.12 – Quantum of development served off each access (Option A)

Access	Units/sqm
Mill Lane	150 Dwellings
Mill Lane/ Blackbrook Avenue	700 Dwellings
	Primary School (up to 420 pupils)
Poplars Ave. *(Central)*	330 Dwellings
	Food Store (2,000sqm)
	Local Centre (600sqm)
	Family Pub/ Restaurant (800sqm)
	100-Bed Care Home
Poplars Ave. *(West)*	Employment (7,500sqm)
Birch Avenue	20 Dwellings
Grasmere Avenue	Sports Pitches and Community Facilities

8.66 For assessment purposes, it is assumed that first occupation will be in 2021, with 120 dwellings being occupied per year through to 2030. This has been agreed with officers at WBC. Therefore, the number of vehicle trips at each access point considering full build out (i.e. a future year of 2030) has been provided below in **Table 8.13** using the trip rates set out above for the whole Peel Hall development. Again, no discounts have been applied to these figures.

Table 8.13 – Summary of 2030 peak hour vehicle trip numbers at each access location (Option A)

Access	Quantum of Development	AM Arrival	AM Departure	PM Arrival	PM Departure
Poplars Avenue (Central)	330 dwellings	74	173	163	101
	care home	7	7	8	8
	food store	92	61	181	191
	local shops	30	29	36	39
	family pub	0	0	23	15
	Total	*203*	*270*	*411*	*354*
Poplars Avenue (West)	employment land	69	39	20	47
Mill Lane	150 dwellings	34	79	74	46
Mill Lane/Blackbrook Avenue	700 dwellings	158	366	347	215
	primary school	113	79	19	27
Birch Avenue	20 dwellings	5	11	10	6
Grasmere Avenue	community uses	10	5	7	8
	Total	**592**	**849**	**888**	**703**

***Note splitting the residential parcels results in discrepancies in rounding; the minor differences in total flows set out in Table 8.11 and 8.13 are not a cause for concern.**

8.67 It can be seen from the above that when considering the total number of vehicle trips at each access location there may be up to around 1,441 vehicle movements arising from the Peel Hall development profile in AM peak hour and 1,591 in the PM peak hour, when adjustments are made for internal trips or discounting.

8.68 However, it is considered appropriate to apply a trip discount to these figures, as the above represents double counting of vehicular trips when considering, for example, that the vehicular trip associated with a resident travelling to the local centre will be represented as both a trip departing from the dwellings and a trip arriving at the local centre. Furthermore, that a trip to the local centre from a residential dwelling within the main areas of the site would not actually travel onto the local highway network in any event and therefore should not be assessed for impact.

8.69 Further to discussions with WBC, it is proposed that no discounting of trips will occur with the residential, care home, community uses, and family pub/restaurant or employment land uses.

8.70 The food store trips are to be discounted by 100% in the SATURN modelling in terms of new trips on the network, to mirror the agreed approach for Omega, but 30% of these trips will be redistributed from existing traffic on the network passing by the Poplars Avenue access. Again, in line with the Omega process agreed and accepted by WBC. These pass-by trips will have no material impact on the operation of the wider highway network.

8.71 It is proposed that the local centre car park will be split into two sections with a physical barrier to prevent through-traffic between both sections of the site, whilst facilitating access to the local centre from both Poplars Avenue in the south and Blackbrook Avenue/Mill Lane in the east. This arrangement results in 86% of the 1,200 dwellings having vehicular access to the local centre and as such will be contained within the Peel Hall site i.e. not travelling onto the local highway network. An indicative layout of the local centre car park is shown on the extract contained at **Figure 5.9** of this report.

8.72 It should also be noted that the local centre car park will also facilitate school drop off and pick up for all pupils due to the split sections i.e. facilitating access for drop off/collection associated with the school from Poplars Avenue as well as Blackbrook Avenue/Mill Lane in the east. This has been designed with the intention of further reducing the traffic impact of the Peel Hall development on the local highway network and avoid the local residential roads becoming congested with parked cars associated with dropping-off/picking-up of school pupils. The high standard and level of provision of cycle and pedestrian links throughout the development will also help to reduce car use and car miles travelled.

8.73 Furthermore, it has previously been set out in HTp Technical Note 1107/TN/13 (**Appendix 45**) that the proposed primary school is not intended as a replacement facility and that primary school trip discounts should be based on internal trip containment; the number of pupils expected to be generated by the development based on the calculation factor supplied by WBC, and comparing this to the number of children expected in a school with up to two-form entry i.e. up to 30 children in each class (therefore 60 children per year group from reception to year 6 i.e. 420 children).

8.74 The information for primary school places issued by WBC was based on census data and the following calculation:

0.3 pupil places per dwelling x number of dwellings

0.3 x 1,200 = 360 (85% of 420 primary school places)

8.75 The calculation indicates that the development may generate around 360 primary school places. In consideration that not all of the primary school aged pupils will use the new on-site facility and that not all of the 1,200 dwellings will have primary school aged children, it is considered appropriate to apply a 50% discount to the primary school trips rates rather than an 85% discount.

8.76 Therefore, in summary trip discounts can be summarised as follows for both the AM and PM peak hours:

i. Residential 0%
ii. Care Home 0%
iii. Employment 0%
iv. Food Store 100% (70% discounted and 30% pass-by)
v. Local Centre 100%
vi. Family Pub/Restaurant 0%
vii. Primary School 50%
viii. Community uses 0%

8.77 These discounts have been applied to the figures contained in **Table 8.13** (taken from HTp Technical Note 1107/TN/19 contained in **Appendix 46** for reference) and a revised summary of the proposed Peel Hall development trips for access scenario Option A is set out on **Table 8.14** following.

Table 8.14 – Summary of 2030 peak hour vehicle trip numbers at each access location (Option A - with discounts applied)

Access	Quantum of Development	AM Arrival	AM Departure	PM Arrival	PM Departure
Poplars Avenue (Central)	330 dwellings	74	173	163	101
	care home	7	7	8	8
	food store*	28	18	54	57
	local shops	0	0	0	0
	family pub	0	0	23	15
	Total	*109*	*198*	*248*	*181*
Poplars Avenue (West)	employment land	69	39	20	47
Mill Lane	150 dwellings	34	79	74	46
Mill Lane/Blackbrook Avenue	700 dwellings	158	366	347	215
	primary school	57	40	10	14
Birch Avenue	20 dwellings	5	11	10	6
Grasmere Avenue	community uses	10	5	7	8
	Total	**442**	**738**	**716**	**517**

*** pass-by trips only**

8.78 It can be seen from the above that when considering the total number of vehicle trips at each access location there may be up to around 1,180 vehicle movements arising from the Peel Hall development profile in AM peak hour and 1,233 in the PM peak hour.

8.79 The figures from **Table 8.14** have used in the SATURN modelling for the Option A Do Something scenarios for the future year of 2030.

8.80 WBC officers also required comfort in the analysis due to the length of the build and in the event that full build out may not be achieved to ensure that the operation of the network is safeguarded against any mid build out changes and risk is minimised. Therefore, a sensitivity test has been carried out for an intermediate year of 2025 for the Option A access strategy.

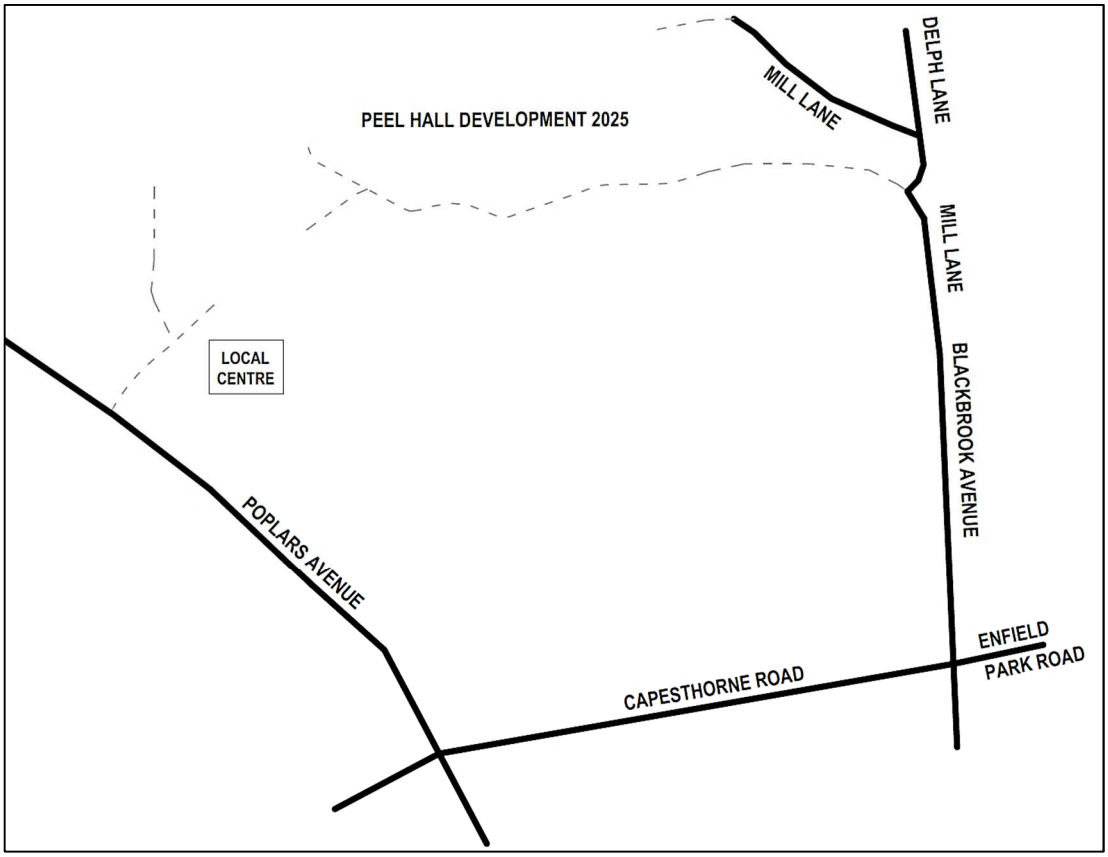
Access Strategy - Option A (intermediate assessment year of 2025)

8.81 Further to their December consultation response (**Appendix 5**), it has been agreed with WBC that an intermediate year of 2025 will be assessed in terms of the traffic impact on the local highway network before the internal link to the local centre is created. As such, all dwellings taking access from the Mill Lane/Blackbrook Avenue access will have to drive onto the surrounding local highway network in order to access the local centre by car. It is agreed that this will present a worst-case intermediate build out scenario, with no discounting of vehicular trips for any of the land uses.

8.82 The indicative highways build out programme is set out in **Table 7.1** and on the accompanying plan contained in **Appendix 38**), and this has informed the 2025 assessment in terms of the loading of development traffic (and for which land uses) at each respective access point from the existing local highway network.

8.83 The assessment for a future year of 2025 will be for 600 residential dwellings, the care home, employment land and local centre as well as the relocation of the sports pitches. However, there will be no connecting through route for dwellings accessed from the Mill Lane/Blackbrook Avenue access point (48% of the 600 dwellings), which is scheduled by the end of that year (as shown in **Figure 8.1** below). Therefore, these trips have been added onto the network for the 2025 scenario.

Figure 8.1 - Peel Hall network 2025 before road link to local centre



8.84 From **Table 7.1** the anticipated number of dwellings coming forward in each year from each part of the development, and hence off each access point, are set out. The table also demonstrates when the other land uses such as the local centre, school and employment land will come forward for development. It can be seen from this table that:

i. The sports pitches will be relocated to the land off Grasmere Avenue in year one (i.e. 2021).
ii. The local centre and care home will come forward in year two (i.e. 2022).
iii. Employment land may come forward in year three (i.e. 2023).
iv. There will be circa 600 dwellings occupied by 2025, as follows:
    - Blackbrook Avenue/Mill Lane – 285 dwellings (main site access).
    - Poplars Avenue – 145 dwellings (local centre access).
    - Mill Lane – 150 dwellings.
    - Birch Avenue – 20 dwellings.

8.85 Therefore, based on the number of dwellings and other land uses coming forward by 2025 as set out above, the number of vehicle trips at each access point are provided in **Table 8.15** below using the trip rates set out as also provided above.

Table 8.15 – Summary of 2025 peak hour vehicle trip numbers at each access location (Option A)

Access	Quantum of Development	AM Arrival	AM Departure	PM Arrival	PM Departure
Poplars Avenue (Central)	145 dwellings	33	76	72	45
	care home	7	7	8	8
	food store	92	61	181	191
	local shops	30	29	36	39
	family pub	0	0	23	15
	Total	*162*	*173*	*320*	*298*
Poplars Avenue (West)	employment land	69	39	20	47
Mill Lane	150 dwellings	34	79	74	46
Mill Lane/Blackbrook Avenue	285 dwellings	64	149	141	88
Birch Avenue	20 dwellings	5	11	10	6
Grasmere Avenue	community uses	10	5	7	8
	Total	**344**	**456**	**572**	**493**

8.86 It can be seen from the above **Table 8.15** that when considering the total number of vehicle trips at each access location there may be up to around 800 vehicle movements arising from the Peel Hall development profile in the AM peak hour and 1,065 in the PM peak hour in the intermediate assessment year of 2025.

8.87 No trip discounting for any of the land uses has been carried out for this intermediate build out assessment, and no pass-by trips have been taken into account for the food store and other local centre uses. Furthermore, as set out above, no discounting for internal trips to the local centre facilities have been made to account for those dwellings accessed from Poplars Avenue (145 dwellings) or linked trips between the non-residential land uses. It is therefore considered that this is a robust approach that gives confidence to the impact assessment arising.

Access Strategy - Option B (Through Route)

8.88 The trip rates will be the same for both access strategies. However, the proposed through route will carry local traffic as well as serve to facilitate access to the following elements of the development profile:

i. Up to around 850 dwellings.
ii. Local centre (comprising a food store of up to 2,000sqm GFA plus up to a further 600sqm GFA of local centre type facilities plus a family pub and restaurant of up to 800sqm GFA).
iii. Up to two-form entry primary school.
iv. An area of employment land comprising up to 7,500sqm GFA of light industrial units.

8.89 For reference, the remaining development profile is proposed to be served as follows:

i. Up to 20 dwellings off Birch Avenue.
ii. Up to 180 dwellings and a 100 bedroomed care home off Poplars Avenue (central); with a bus gate to prevent general vehicular traffic travelling between the through route and the residential area of Poplars Avenue.
iii. Up to 150 dwellings off Mill Lane (north).
iv. Sports pitches and community uses served from Grasmere Avenue.

8.90 The development profile and respective vehicular trip levels (and discounts as set out in **paragraph 8.68** to **8.78**) are provided in **Table 8.16** for the Option B through route scenario (taken from 1107/TN/21 contained in **Appendix 48**).

Table 8.16 – Summary of 2030 peak hour vehicle trip numbers at each access location Option B (with discounts applied)

Access	Quantum of Development	AM Arrival	AM Departure	PM Arrival	PM Departure
Poplars Avenue (Central)	180 dwellings	41	94	89	55
	care home	7	7	8	8
	Total	*48*	*101*	*97*	*63*
Poplars Avenue (West) through to A49 & Mill Lane/Blackbrook Avenue	food store*	28	18	54	57
	local shops	0	0	0	0
	family pub	0	0	23	15
	850 dwellings	191	445	421	261
	primary school	57	40	10	14
	employment land	69	39	20	47
	Total	*345*	*542*	*528*	*394*
Mill Lane	150 dwellings	34	79	74	46
Birch Avenue	20 dwellings	5	11	10	6
Grasmere Avenue	community uses	10	5	7	8
	Total	**442**	**738**	**716**	**517**

*** pass-by trips only**

8.91 The through route assessment for the Peel Hall SATURN model has been carried out with the above vehicle trips and loading. It can be seen from **Table 8.16** that there will be up to around an additional 1,200 vehicle trips on the local highway network in each of the weekday peak hours as a result of the Peel Hall development under the Option B through route access strategy in a future year of 2030 (as per **Table 8.14** for access strategy Option A in 2030).

Saturday and Sunday Trip Rates Review

8.92 A sensitivity test has been carried out further to the review of Saturday and Sunday peak hour traffic data (**Section 2.0**) to forecast the Peel Hall development traffic impact on weekends using trip rate data.

8.93 There is a limited number of weekend TRICS datasets for some of the land uses. For example, only one Saturday and two Sunday residential datasets were identified that satisfied the selection criteria. TRICS data was obtained for residential, food store and family pub/restaurant trips and this in contained in **Appendix 49** for reference.

8.94 Trip rates for the Care Home land uses have been taken from the busiest week day peak hour in order to provide a comparison (**Appendix 40**). Employment trips and primary school trips have been assumed to be negligible on a weekend (no TRICS surveys available) and therefore not included for within this comparison.

8.95 The community uses trip rates for weekends has been based on the calculations set out in the 2013 Mill Lane Appeal, which was based on forecast participation associated with the football facilities and the following key assumptions:

i. Up to four matches could be played at any one time, although in reality the start times would be staggered.
ii. Up to 11 players per team for the three full-sized pitches, plus two substitutes per team ((11+2) x2 teams x3 pitches).
iii. Nine players per team for the junior pitches, plus two substitutes per team ((9+2) x2 teams x1 pitch).
iv. One referee per match only (4).
v. A conservative occupancy of 1.5 players per car and each one referee per car.

8.96 Therefore it is calculated that there could be up to around 71 vehicles to transport these players and referees. If accounting for all arrivals and departures occurring within the same hour to assess for the overlap of games, this is up to around 142 vehicular movements.

8.97 The resultant trip rates and forecast weekend trips are set out on **Table 8.17** below.

Table 8.17 – Peel Hall weekend vehicular trip generation summary

Development Traffic	Peak Hour 1100-1200			
	Arrival Trip Rates**	Departure Trip Rates	Arrival Trips	Departure Trips
Residential (1,200 dwellings)	0.193	0.280	232	336
Care Home (100 beds)	0.098	0.113	10	11
Food Store* (2,000sqm)	6.516	6.110	(39) 30%	(37) 30%
Family Pub/Restaurant (800sqm)	1.783	0.578	14	5
Community Uses	-	-	71	71
		Total Trips	**366**	**460**

*** 30% pass-by trips only**
**** per dwelling/bedroom/100sqm**

8.98 It can be seen from **Table 8.17** that there may be up to around 826 vehicle trips on the local highway network during the weekend peak hour. This is in excess of 350 vehicle trips less that the quietest week day peak hour assessed for (1,180 in the AM peak hour and 1,233 in the PM peak hour, see **Table 8.16**).

8.99 Even considering 100% of food store traffic with no discounts applied (an additional 177 vehicle movements) this only brings the total peak hour development traffic to circa 1,000 vehicle movements in the weekend peak hour. Some 200 movements below that already assessed for.

8.100 It is therefore concluded that weekend peak period traffic assessments are not required as these would be broadly similar in magnitude or lower than the weekday peak hours included for within this assessment, even when taking into consideration the traffic flow data contained in **Section 2.0** (**paragraphs 2.13** to **2.17**).

9.0 Development Trip Distribution

9.1 As part of the Transport Assessment process it was agreed with HE and WBC highway officers to expand the existing VISSIM micro simulation model that covers parts of the M62 and A49 corridors, which was developed by AECOM on behalf of HE.

9.2 A distribution model was prepared by AECOM to derive the trip distribution for each of the proposed land uses based on the zoning levels contained in the Warrington VISUM Multi Modal Transport Model (MMTM). The Warrington MMTM is based on observed traffic flows and origin destination data, which gives confidence to the data derived from the AECOM Peel Hall distribution model. The use of the VISUM MMTM was agreed by highway officers in 2016.

9.3 AECOM gained permission from WBC to extract a cordon from the 2008 Warrington VISUM model of the study area (software for traffic analysis forecast and GIS-based data management, to model road users and their interactions) to collect origin-destination (OD) data. The information was extracted and used as a prior matrix for the Peel Hall SATURN model as agreed.

9.4 The distribution of new trips for the Peel Hall development used the three existing zones of the same land use categories from the 2008 VISUM matrices as a proxy: residential; employment; other (being the primary school, the local centre and food store, care home, family pub and sports facilities). These trips were split out in the SATURN to provide an improved response to routeing within the model. AECOM used their extensive modelling experience, particularly of the Warrington area, to carry out this element of the assessment work.

9.5 When the VISSIM model was developed, AECOM undertook sanity checks of the matrix estimations, prior to running the models in final validation form, to ensure the movements remained realistic.

9.6 AECOM updated the trip distribution exercise based on the revised matrices for both VISSIM and SATURN models. It can be noted that the 2008 OD data was also uplifted to 2015.

9.7 Due to the constrained nature of the network and the very many different route choices for all car drivers (not just those forecast to arise from the development site) it is considered that the data used since 2016 in this modelling process is reasonable. This technique was not questioned by Atkins who were originally the consultants for WBC and for HE.

9.8 The AECOM technical note on trip distribution setting out the methodology and results from the distribution model is contained at **Appendix 58** (Appendix E to the AECOM Forecasting Report). The distribution model has been fed directly into the Peel Hall SATURN model in order to produce future year assignments throughout the study area. The resultant distribution of flows has been modelled and assessed in **Sections 13.0** and **14.0**.

9.9 The Omega approach used census 2011 data for the residential distribution assumptions, which, based on the site location and surrounding highway network was a simpler exercise than for the Peel Hall model with the surrounding network of residential roads. However, trip distributions for all the other land uses were based purely on assumptions. The pass-by trips for the food store was based on existing traffic flow proportions at the site access.

9.10 It is therefore concluded that the distribution model created by AECOM based on proxy zones is as appropriate as other alternative approaches to forecasting traffic distribution.

10.0 Background Traffic Growth

10.1 At the meeting with WBC highway officers in March 2017 it was agreed that a 10 year build-out programme would be suitable for the transport assessment work. It was also agreed that the 2019 assessment would become 2021 in terms of first year of occupation, but that an intermediate assessment would be carried out for 2025 with a final assessment in 2030.

10.2 In May 2017, the growth rates were updated for modelling the traffic impact of the proposed Peel Hall development in the future years of 2025 and 2030, following the same parameters previously agreed with WBC and HE.

10.3 Previously TEMPRO 6 (version 6.2) was used to inform the VISSIM modelling. However, because the modelling was being revised the opportunity was taken to use the most recent version of TEMPRO at that time (TEMPRO 7) for the future year assessments. The latest version currently available is version 7.2, which was used for this assessment.

10.4 There are normally two approaches for assessing growth, both are which are valid:

i. Use a low growth factor and add in traffic from all committed development.
ii. Use high national or local growth factors and accept that these allow for committed development.

10.5 The approach taken in this assessment was to use local motorway growth factors, as per **point 10.3(ii)** above. This was agreed in 2016. This was also the Omega approach. We also added in some of the committed developments (see **Section 11.0**) and this approach was agreed with officers.

10.6 This section of the report draws upon HTp Technical Note 1107/TN/20 (contained in **Appendix 50** and includes the TEMPRO screen shots), which draws upon the data set out in HTp Technical Notes 1107/TN/07 and 1107/TN/07/Addendum (contained in **Appendix 51** and **52** respectively for reference).

10.7 Technical Note 1107/TN/07 on Growth Rates dated May 2016 set out the agreement to use motorway growth rates for the modelling. It should be noted that this represents an over-estimate for the traffic growth over much of the model network because it is the highest growth factor from this dataset in the TEMPRO programme. It was agreed however that this will provide confidence in the modelling results as well as account for trips from the OMEGA development. This mirrored the Omega approach, using Urban Motorway growth rates for the Warrington 00EU1 NTEM dataset for cars.

10.8 In the Peel Hall model, to convert 2014 traffic survey data to a base year of 2015 TEMPRO version 6.2 has been used, as agreed, as at the time of matrix construction this was the current version.

10.9 It is confirmed that the growth rate for cars was applied to all trips. Furthermore, no seasonality index has been used. This approach was accepted in 2016.

10.10 As set out in 1107/TN/20, TEMPRO version 7 uses census 2011 Super Output Areas (mid layer) data. The Peel Hall development is situated in the (Warrington 006) area and the resultant motorway growth rates for this area for cars are set out in **Table 10.1** below.

Table 10.1 – Growth rates

	AM	PM
2015-2025	1.1749	1.1652
2015-2030	1.2211	1.2098

10.11 It is shown in HTp Technical Note 1107/TN/20 that the Warrington 006 area has a higher level of predicted growth than the other surrounding areas. Furthermore, no changes were manually made to the predicted future housing numbers or employment statistics.

10.12 As the growth rates were lower in the surrounding areas, the decision was made based on previous discussions with WBC, and further to the Omega approach, to not create an average growth rate by combining the results for the adjacent areas. It is acknowledged that the geographical area covered by the growth rates in **Table 10.1** above does not include for the location of all of the committed development sites, but it was considered that if the growth rates were reduced this would conversely not account for the committed developments that had previously been agreed as included for within the TEMPRO factors, such as Calver Park and Birchwood Park.

10.13 It remained apparent however, even after the change in background growth predictions, that the VISSIM software was struggling to run and calibrate the Peel Hall network for the base year of 2015. The result of this was that data could not be extracted from the model as calibration was required in order to extract traffic flow and queue information. It should be noted that the Omega VISSIM, which was a less complex network, also had issues with locking up.

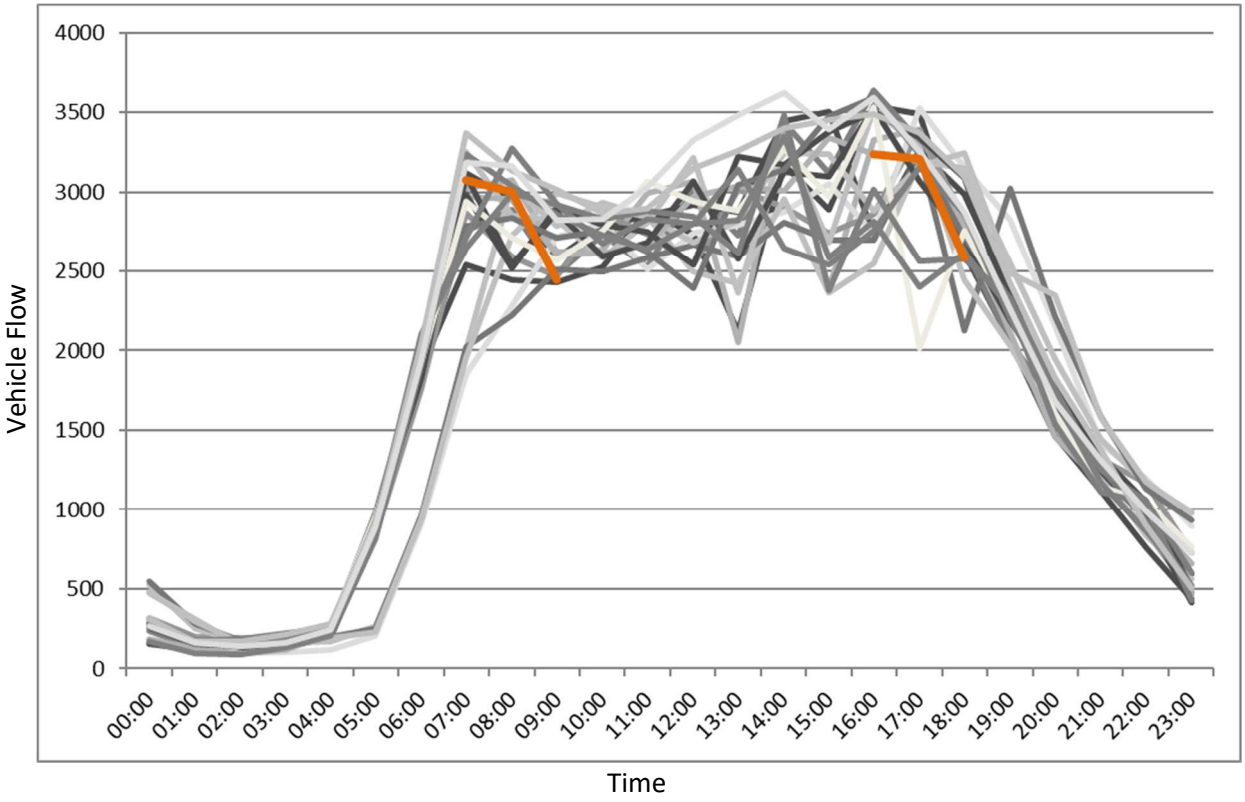
10.14 The Omega approach was to adopt the use of constrained traffic flows in order to run and calibrate future year models. Background growth was effectively reduced to enable the VISSIM model to derive outputs without locking up. Further adaptations were made to the VISSIM model such as reducing gap times and adding links at junctions to enable traffic to flow more freely throughout the local road network in the model. It was considered by WBC and the Omega consultant team that the robust nature of the derivation for the development trips assigned to the model (see **Section 8.0** of this report, where it is concluded that the Peel Hall process was more robust utilising higher trip rates) justified these adjustments.

Observed Local Growth

10.15 Further to discussions with WBC and receipt of the WSP review of the SATURN data, HTp have reviewed the A49 MCC survey data collected in 2014 at the Sandy Lane West/A49 signalised roundabout (**Appendix 9**) and the recently precured A49 ATC data from WBC for 2017 (**Appendix 10**). This has been plotted for analysis to ascertain if there has been growth on the local highway network.

10.16 The two-way hourly traffic flows on the A49 between its junction with the M62 Junction 9 to the north and Sandy Lane West/Cromwell Avenue to the south are shown on **Figure 10.1** below.

Figure 10.1 – A49 weekday traffic flows (2014/2017)



10.17 This graph shows 20 weekdays between Monday 23rd October 2017 and Friday 17th November 2017 in shades of grey. The peak hour MCC survey undertaken on 8th July 2014 is shown in orange.

10.18 Firstly, the July 2014 flow data is located within the range of the 2017 surveys and is therefore considered a valid survey. Secondly, it should also be noted that the July 2014 survey peak hours are located at the upper range of the 2017 surveys which therefore suggests that no material growth has occurred from 2014 to 2017.

10.19 To substantiate this further, annual traffic count data has been downloaded from the Department for Transport's traffic count website (https://www.dft.gov.uk/traffic-counts/) for the A49 between its junctions with the M62 Junction 9 to the north and with Sandy Lane West/Cromwell Avenue to the south (Count point ID: 8321). An extract of the data is provided at **Table 10.2**.

Table 10.2 – DfT data for A49 Warrington south of M62 Junction 9

AADF Year	Estimation method	All Motor Vehicles
2000	Estimated	42999
2001	Counted	44916
2002	Estimated	44791
2003	Counted	42237
2004	Estimated	42226
2005	Counted	40744
2006	Estimated	40922
2007	Counted	43137
2008	Estimated	42607
2009	Counted	40549
2010	Counted	40806
2011	Estimated	40840
2012	Counted	38662
2013	Estimated	38552
2014	Counted	38771
2015	Estimated	38485
2016	Counted	39417

10.20 The data shows that the average annual daily flow (AADF) of all motor vehicles along this link fluctuates between a low of 38,485 during 2015 and a maximum of 44,916 during 2001. The data appears to show a general variation in flow between the years. The presence of in excess of 40,000 vehicles from 2000 (the first year available) to 2011 followed by less than 40,000 vehicles from 2012 to 2016 (the most recent year available) suggests that there has not been any significant growth. Therefore, it can be concluded that the north Warrington network is constrained to the west of the site.

10.21 In terms of traffic growth to the east of the site, we have obtained DfT traffic count data for count point ID: 77943 on the A574, east of the Birchwood Park/Oakwood Gate junction further to discussions with the highway officer. The count data is tabulated below for 2000 to 2016, with the actual count data highlighted green (the others are estimated flows) in **Table 10.3**.

Table 10.3 – DfT data for A574 Warrington east of Oakwood Gate

AADF Year	Estimation method	All Motor Vehicles
2000	Estimated	12773
2001	Estimated	12391
2002	Estimated	12613
2003	Counted	12330
2004	Estimated	12654
2005	Estimated	12270
2006	Estimated	12057
2007	Counted	12953
2008	Estimated	12715
2009	Estimated	12957
2010	Estimated	12984
2011	Estimated	13099
2012	Estimated	12936
2013	Estimated	12909
2014	Estimated	13315
2015	Estimated	13604
2016	Counted	12764

10.22 In summary, it can be seen from **Table 10.3** that of the 16 years' worth of data, only three were manual counts. The three counted (i.e. known) years of 2003, 2007 and 2016 show similar traffic flows, with the greatest occurring 2007. Traffic flows were recorded as lower during 2016 than 2007 and as such annual growth can also be considered minimal on the A574 east of the Peel Hall site.

10.23 Furthermore, at the HE meeting on 14th November 2017, it was clarified by their consultants, Atkins, that the use of growth rates on top of survey data is likely to result in higher forecast flows in the future year models, since it is acknowledged that in reality traffic growth on this network is heavily constrained.

10.24 WBC have also confirmed that there appears to be limited growth on this network.

11.0 Committed Development

11.1 A list of committed developments within the local area to be considered in the Peel Hall modelling was provided by WBC in 2016. These have been previously set out in Technical Notes 1107/TN/10 (contained in **Appendix 53**) and 1107/TN/20 (contained in **Appendix 50**) and were subsequently agreed with WBC highway officers as follows:

i. Land at Benson Road, Birchwood (ref: 2015/26220).
ii. Birchwood Shopping Centre (ref: 2015/25880).
iii. Birchwood Park (ref: 2015/26044, 2014/23358 and 2008/12744).
iv. Calver Park (ref: 2015/26685 and 2013/22533).

11.2 It should be noted that the application for the B&Q extension at Winwick (ref: 2015/26628) for a click-and-collect area and storeroom and relocation of the garden centre area, which was granted on 12/02/16, has not been included within the identified committed developments as it has been agreed that there will be no net change to the store's overall GFA, and it is therefore considered that there would be very little, if any, impact on the local highway network during peak hours as a result of this development. See the highway officer's correspondence confirming this approach contained in **Appendix 50**.

11.3 As set out in **Section 10.0**, the VISSIM software was struggling to run with the level of traffic on the network in the base and Do Minimum (no development traffic) scenarios. Therefore an in-depth review of the TEMPRO growth factors was carried out in October 2016 and summarised in our Technical Note 1107/TN/07/Addendum on Traffic Growth (**Appendix 52**).

11.4 Further to this review, it was agreed with highway officers that two of the employment sites identified as committed developments; Calver Park (ref: 2015/26685 and 2013/22533) and Birchwood Park (ref: 2015/26044, 214/23358 and 2008/12744), are included in the Local Plan. Therefore, it was agreed at that time that it could reasonably be assumed that an estimation of the volume of trips these developments would generate will have been provided by Warrington and feed into TEMPRO, and as such these committed developments have not been added again in the future years. This was agreed in 2016, but as set out in **Section 10.0** the principle was applied to the updated growth rates obtained from the TEMPRO v7.2, and the higher growth rates used to account for committed development traffic on the network.

11.5 In summary, the committed developments specifically added to the Peel Hall modelling Do Minimum future year scenarios (and subsequently in the Do Something scenarios) are as follows:

i. Land at Benson Road, Birchwood (ref: 2015/26220).
ii. Birchwood Shopping Centre (ref: 2015/25880).

11.6 The corresponding vehicular trip numbers over the peak periods of 0700 to 0930 and 1600 to 1830, and subsequent trip loading locations for each site identified are set out in 1107/TN/07/Addendum (**Appendix 52**) for ease of inserting into the VISSIM model using the distribution model, and these have been transposed to the SATURN model. The distribution for these trips has been based on the Peel Hall distribution model provided by AECOM.

11.7 It was agreed with officers that the Omega zone 7 trips did not need to be separately added onto the network as this location was considered by officers to be too far from the modelled Peel Hall network to make an impact (see email contained in **Appendix 54**). The Omega trips are set out in more detail below.

OMEGA Trips

11.8 A short summary is now provided for ease of reference regarding the quantum of trips that the agreed Omega VISSIM assessments assigned to the links that were included for within the Peel Hall VISSIM network (and subsequently transposed to SATURN).

11.9 It has previously been agreed that the use of the motorway growth rates for the whole VISSIM network will capture the OMEGA development trips across the network, and, as set out in **paragraph 11.7** above, that Zone 7 of the Omega development was considered by highway officers to be too far away form the Peel Hall modelling network to create an impact.

11.10 **Table 11.1** below sets out the actual traffic flow figures from the agreed Omega South Zones 3-6 VISSIM model (residential/hotel/pub/care home/local centre with 2,000sqm food store) and the Omega Section 73 (the variation of prior planning permission at Zones 1 and 2), that travel to/from those links also included for within the Peel Hall model; M62 junction 9, A49 north and south of this, and Delph Lane as illustrated below in **Figure 11.1**. This demonstrates the large gap between the local road network modelled in the Omega VISSIM and the Peel Hall VISSIM

Figure 11.1 – Omega VISSIM network (overlap with Peel Hall VISSIM highlighted in red)

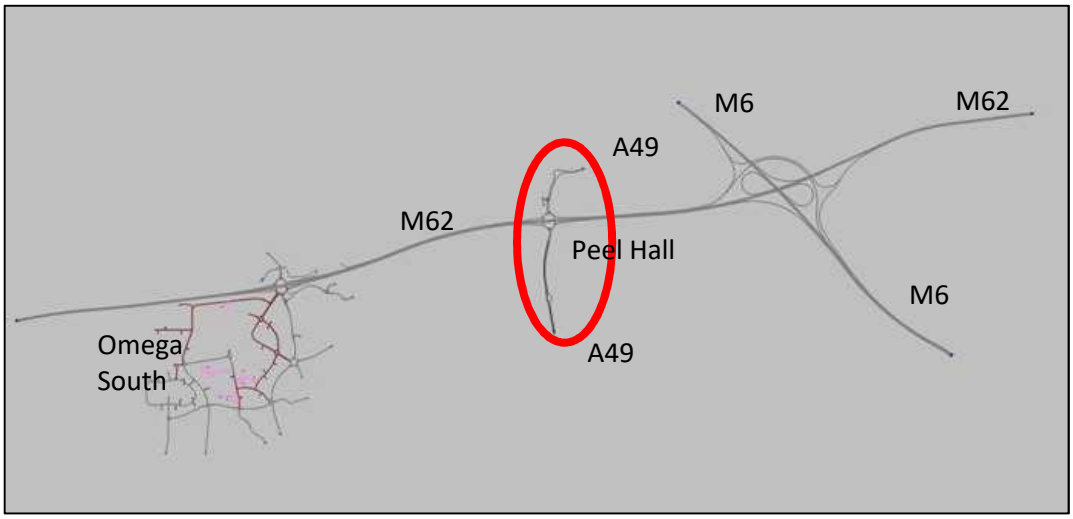


Table 11.1 – Trip distribution for the OMEGA Zones 3-6 and Zones 1-2 S.73 application

	OMEGA development trips	AM Peak Hour (0800-0900)		PM Peak Hour (1700-1800)	
		Arrivals (to OMEGA)	Departures (from OMEGA)	Arrivals (to OMEGA)	Departures (from OMEGA)
OMEGA Zones 3-6	Delph Lane (M62 J9 North)	0	0	0	0
	A49 North (M62 J9)	3	7	7	4
	A49 South (M62 J9)	0.5	1.2	1.1	0.7
	Total	4	8	8	5
	M62 Junction 10 North	10	24	23	14
	M62 East (M62 J10)	52	120	119	72
	M62 J10 South	13	29	28	17
Total Trips (OMEGA Z3-6)		79	182	177	108
OMEGA Zones 1-2	Delph Lane (M62 J8 North)	0	0	0	0
	A49 North (M62 J9)	4	1	1	5
	A49 South (M62 J9)	6	2	2	3
	Total	10	3	3	8
	M62 Junction 10 North	10	4	3	11
	M62 East (M62 J10)	11	5	4	10
	M6 J10 South	14	6	4	12
*Total Trips (OMEGA Z1-2)**		45	19	14	41

*** This row includes for rounding of previous figures**

11.11 As can be seen from the table above, the level of trips from the Omega planning applications proposed to travel onto the non-motorway links of the Peel Hall VISSIM network are so low as to be immaterial.

11.12 However, those trips associated with the Omega South Zones 3-6 application that stay on the motorway network through the extent of the Peel Hall model have been considered further in **Table 11.2** below, based on a the previously used future year of 2019 that was provided in HTp Technical Note 1107/TN/07/Addendum.

Table 11.2 – Comparison of Omega motorway contained trips through the Peel Hall model and the growth applied.

M62 Flows 2015 Base Model			M62 2019	Total Increase in Trips 2015-2019	OMEGA Z1-6	OMEGA % Impact 2019
Eastbound	AM	9065	9665	600	188	2%
	PM	10107	10783	676	136	1%
Westbound	AM	10017	10680	663	110	1%
	PM	12138	12950	812	184	1%

11.13 This **Table 11.2** clearly shows that the Omega trips contained to the M62 are also more than accounted for within the motorway growth rates that have been applied to the Peel Hall VISSIM model, and subsequent SATURN modelling, even when considering the change of assessment years and motorway growth rates applied.

11.14 It has been agreed with officers that due to the location of the Omega development from the Peel Hall site it would not need to be accounted for separately within the modelling, over and above the local growth rates that are to be applied.

11.15 It is therefore concluded that the identified committed developments, associated trip rates and subsequent trip loading provided for the wider area modelling are appropriate.

12.0 Capacity Assessment - SATURN Model

12.1 WBC recently set out that they had not fully validated the original Peel Hall VISSIM base model. However, the model presented in January 2017 took into account all points raised by HE and WBC at that time and a further run was carried out to address final comments from HE's consultant Atkins (who were still WBC consultants at that time). This final base model was used to extract the relevant information from for the new SATURN model. It is therefore concluded that the VISSIM base model for the Peel Hall site was validated sufficiently. However, as set out previously, due to the time it was taking to run the VISSIM model in order to extract data it was decided that the best approach was to build a SATURN model for the Peel Hall site.

Network Coverage and Use of Saturn

12.2 The initial meeting with WBC and HE on 19th January 2016 was used to discuss and agree the extent of the area to be modelled for the Peel Hall application.

12.3 A VISSIM of the model area was constructed and validated to a base year of 2015. However, due to the nature of how VISSIM calculates route choice, and its methodology for assigning trips onto the model network, the future year models become unworkable within reasonable time constraints and unrepresentative of realistic network conditions. For this reason, at the start of 2017 an alternative modelling package to VISSIM was considered.

12.4 SATURN was recommended by AECOM for the following reasons:

i. HE currently have all their Regional Traffic Models within SATURN.
ii. The same processes and standard modelling methodology for the VISSIM could be applied to the SATURN model build, but the future year SATURN models provide sensible, workable outputs, within a quicker timescale to allow identification of the forecast impact resulting from the development.
iii. The six basic functions of the SATURN software confirm the suitability for use within the Peel Hall model:
    - A combined traffic simulation and assignment model for the analysis of road-investment schemes ranging from traffic management schemes over relatively localised networks (typically of the order of 100 to 200 nodes) through to major infrastructure improvements where models with over 1000 junctions are not infrequent.
    - A "conventional" traffic assignment model for the analysis of much larger networks (e.g., up to 7,500 links in the smallest standard PC version, 200,000 in the largest).
    - A simulation model of individual junctions.
    - A network editor, data base and analysis system.
    - A matrix manipulation package for the production of, e.g., trip matrices.
    - A trip matrix demand model covering the basic elements of trip distribution, modal split, etc.

12.5 The use of SATURN was agreed with WBC March 2017 following the refusal for planning permission at the committee held at the end of February 2017 (see meeting note contained at **Appendix 4**). The geographical coverage of the SATURN model is the same as that agreed for the VISSIM (see **Appendix 55** and **56** respectively). **Figure 12.1** below sets out the Peel Hall model study area and **Figures 12.2** and **12.3** provide extracts of the SATURN and VISSIM zone plans respectively.

Figure 12.1 – Peel Hall study area

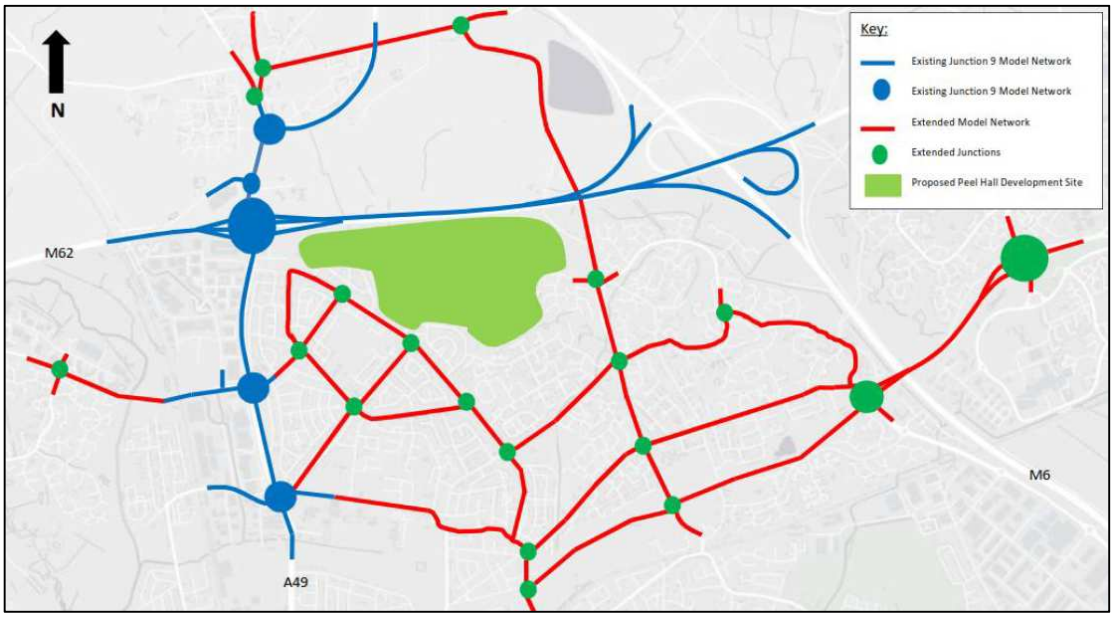


Figure 12.2 – SATURN zone plan

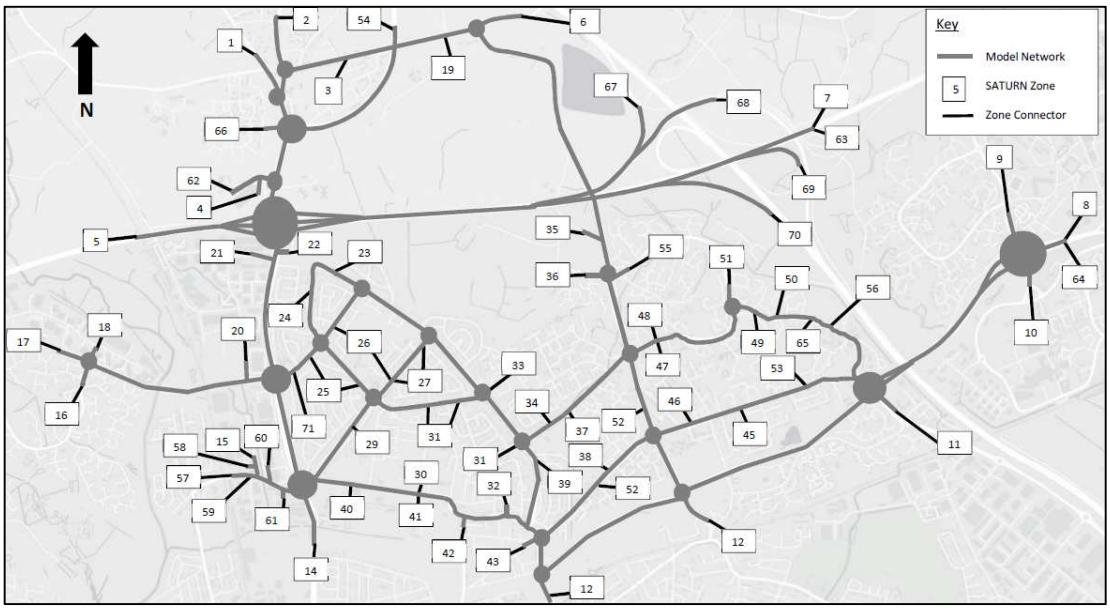
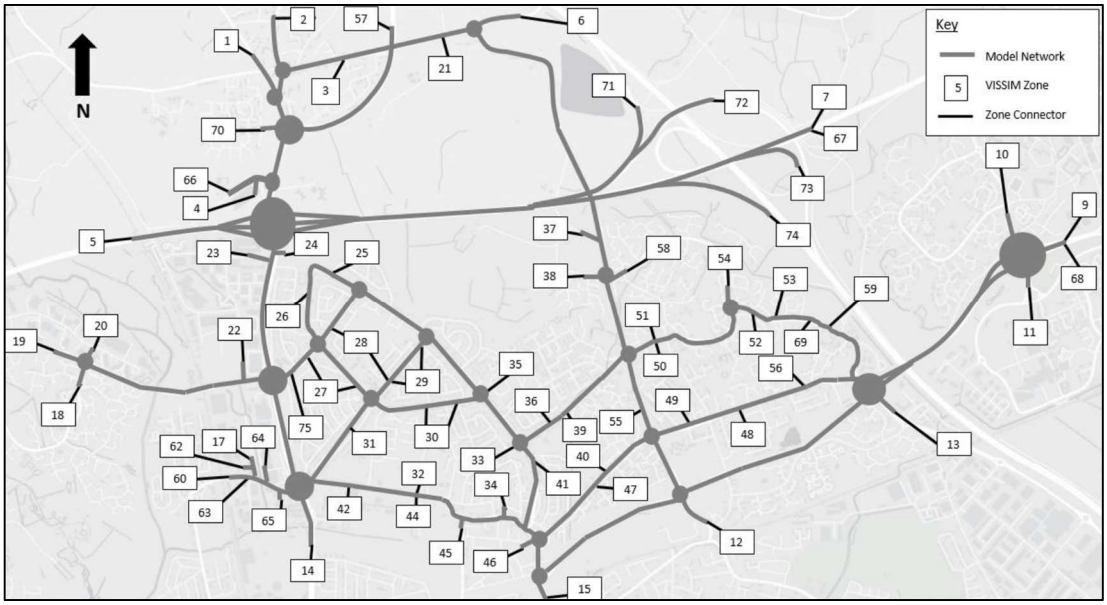


Figure 12.3 – VISSIM zone plan



12.6 At the meeting with HE on 23rd January 2017 the difficulties that had been faced working with VISSIM for this network was also discussed and in terms of the actual impact of the development on the M62 network. Following this, a Technical Note (HTp/1107/TN/15 dated February 2017, contained in **Appendix 46**) was provided to HE setting out the minimal trip impact forecast to arise from the Peel Hall development through Junction 9 of the M62 (se also **Section 8.0**). It was agreed at the meeting in January 2017 and at the meeting held in November 2017 that this junction already experiences significant delay at peak hours.

Base Data

12.7 The OD data was based on the 2008 VISUM model of Warrington, as this was agreed to be the most reliable data set available within the time-frame. The planning application that is the subject of the appeal was validated in mid-2016 and furthermore, 2015 was considered acceptable in early 2017; it is therefore not considered reasonable or necessary to change this now. In any event, the flows related to the motorway network were extracted from Highway England's model.

12.8 A two and half hour model period was developed for both the AM and PM model periods in VISSIM to ensure that VISSIM replicated the rise of fall of queueing across the network. Within that period, it was agreed that the periods of 0800–0900 and 1700–1800 would be reported upon. Within SATURN typically you model a single hour period and then report upon this.

12.9 The SATURN model is intended to provide an assessment of the same data collected and used to inform the VISSIM assessment. This is a process that started in January 2016.

12.10 The SATURN LMVR was provided to WBC and HE in October 2017 and is provided at **Appendix 57** for reference.

12.11 A review of the SATURN LMVR by HE's modelling consultants Atkins and a review by WBC's modelling consultants WSP, and our subsequent responses, are provided at **Appendix 58** and **Appendix 59** respectively.

12.12 For reference, the SATURN Forecasting Report is contained at **Appendix 60**.

Journey Time

12.13 AECOM gained permission from WBC to use BASEMAP to provide journey time data for use in the validation exercise of the Peel Hall model; BASEMAP provides an easy to use platform for gaining access to and interrogating traffic master data.

12.14 The 2016 traffic survey data and 2016 and 2017 observations were also taken into account during validation and calibration of the SATURN model.

12.15 The journey time data on the A574 to the southern edge of the study area in the base model is shown to be slightly higher for eastbound drivers than observed for 2015.

12.16 It should be understood that what is happening on the route now is different to what was happening in 2015 due to the pinch-point scheme at Oakwood Gate. Therefore, a comparison between the 2015 model, recorded journey times in 2015 and on-site observations since 2016 is subjective. Not least because of number of options available to drivers in terms of alternative route choice. Further detail on a review of the A574 journey times is set out further in the HTp response to WSP's review of the Forecasting Report is contained in **Appendix 61**, where it can be seen that journey times along the A574 differ noticeably depending upon the time of the year. A comparison of the same week in 2014 identifies the average journey time in the AM peak to be approximately 10% higher than the journey time observed during 2015.

12.17 Furthermore, site visits to this junction found that eastbound drivers have been repeatedly observed to enter the roundabout very slowly, which has the effect of reducing real time journey speeds and, therefore, the model shows quicker journey times. It was further considered that any further manual alterations to the model would result in over-calibrating the base year. The signals at Oakwood Gate have improved journey times along this section and journey times are recorded faster than those for 2015 in any event.

12.18 It can be confirmed that the existing signal scheme to the northern section of the Birchwood/Oakwood Gate junction is not in the 2015 base model, but is in the future year models. It is therefore concluded that an application of common sense should therefore be made when assessing the 2015 A574 outputs.

12.19 Journey times in the base model vary, with almost all forecast to experience some level of increase as a result of development trips. This is not unexpected. It can be confirmed that traffic signal timings have remained the same between the Do Minimum and Do Something scenarios and have not been optimised. Therefore, as the volume of development trips increase through junctions so do delays/journey times as it takes longer for vehicles to travel through the network.

12.20 The largest impact on journey times is experienced during the AM peak along Blackbrook Avenue/Mill Lane. The route has a number of roundabout junctions and a single signalised junction. Roundabout junctions are more sensitive to changes in traffic flows and so a greater increase in delays is forecast compared to other routes such as the A49, which is predominately signal controlled.

12.21 Quicker journey times are forecast along the A49 in the Option B through route scenario compared to the option A Do-Something scenario as a direct result of the reduction in traffic on the A49 north of the M62. The reduction in traffic results in less delay on the A49 Newton Road northbound approach to its junction with the A49 Winwick Link Road and the link to the north of the roundabout up to its junction with Golborne Road.

12.22 The Birchwood/Oakwood Gate junction currently experiences significant delays and queueing in the PM peak on the eastbound Birchwood Way approach and northbound Oakwood Gate approach. It is therefore expected that delays at this junction would be significant in the future year models. The forecast year VISSIM models predicted similar queue lengths and delays across the junction. Checks between demand and actual flows at Oakwood Gate have been made and were shown to have minor differences only, which confirms that all trips are getting through the network. Given the level of queueing across the existing network within the study area, the forecast queue lengths are believed to be reasonable in the future years of 2025 and 2030.

12.23 In terms of the M62 motorway network and Junction 9, the modelling highlights that the development traffic is forecast to have only a minor impact on the motorway network.

12.24 In summary, it is considered that the Peel Hall model has been calibrated in great detail and specifically coded to replicate the study area.

Modelling Scenarios

12.25 Future years were agreed with WBC as previously set out in **Section 10.0**, and it is considered that these broadly align with what has been previously agreed and therefore are considered acceptable. The modelling scenarios were agreed with WBC and are in line with those requested by HE.

12.26 At the January 2017 meeting with HE it was stated that there is no value in modelling for a full build out in the opening year, and that a phased approached was to be assessed instead; in line with WBC's previous request. Therefore, the scenario for a full build out at year of opening (i.e. 2021) has not been carried out for the SATURN model; this has been replaced by an interim assessment year of 2025 with a partial build out. The modelled scenarios in SATURN are:

i. Base 2015 – this is calibrated from existing traffic count and journey time data.
ii. 'Do Minimum' 2025 – this is the base traffic plus growth to a future year of 2025, plus committed development traffic.
iii. 'Do Something' 2025 – this is the Do Minimum 2025 scenario plus the Peel Hall development flows for a part build-out scenario of 600 dwellings and no internal vehicular link for car traffic between the majority of the residential areas and the local centre.
iv. 'Do Minimum' 2030 – this is the base traffic plus growth to a future year of 2030, plus committed development traffic.
v. 'Do Something' 2030 – this is the Do Minimum 2030 scenario plus full build-out of the Peel Hall development, with an internal link to the local centre, but no through route for general traffic across the site.
vi. 'Through Route' 2030 - this is the Do Minimum 2030 scenario plus full build-out of the Peel Hall development, with a fully open through route for general traffic between the A49 (the new signalised junction proposed) in the west and the proposed new site access roundabout junction with Mill Lane to the east of the site.

Assessment of Impacts

12.27 It was noted within the SATURN model that there are some isolated cases at junctions where journey times fall in 2030 Do Minimum when compared to the corresponding 2025 scenario. This is a complex network with many route choices available and high traffic flows, and therefore it should be noted that this result is considered plausible.

12.28 A plan has been provided in **Appendix 62** that illustrates the location of the junctions referenced in the Forecasting Report and throughout this section of the Transport Assessment, for ease of reference.

12.29 The following is a list of the junctions in the SATURN model:

Junction 1 – Winwick Link Road/Newton Road/A49
Junction 2 – A49/Delph Lane Retail Park
Junction 3 – M62 Junction 9
Junction 4 – Cromwell Avenue/Calver Road
Junction 5 – A49/Sandy Lane West
Junction 6 – A49/A50
Junction 7 – A50/Hallfields Road
Junction 8 – Blackbrook Avenue/Insall Road/Hilden Road
Junction 9 – A574 Birchwood Way/A50 Oreford Road
Junction 10 – A49/Birch Avenue

Junction 11 – Cotswold Road/Through Route Alignment
Junction 12 – Cleveland Road/Poplars Avenue
Junction 13 – Howson Road/Poplars Avenue
Junction 14 – Statham Avenue/Poplars Avenue
Junction 15 – A50 Orford Green/Poplars Avenue
Junction 16 – Sandy Lane/Northway
Junction 17 – A50/Northway
Junction 18 – Sandy Lane West/Cotswold Road/Cleveland Road/Sandy Lane
Junction 19 – Cromwell Avenue/Europa Boulevard/Callands Road
Junction 20 – Capesthorne Road/Poplars Avenue
Junction 21 – A50 Orford Green/Hilden Road/A50 Orford Road
Junction 22 – Ballater Drive/Mill Lane/Enfield Park Road/Blackbrook Avenue
Junction 23 – Capesthorne Road/Blackbrook Avenue/Enfield Park Road
Junction 24 – Birchwood Way/Blackbrook Avenue
Junction 25 – Enfield Park Road/Crab Lane
Junction 26 – Birchwood Way/Crab Lane/Woolston Grange Avenue
Junction 27 – Birchwood Way/Oakwood Gate
Junction PH1 – Peel Hall employment site access priority junction with Cotswold Road and Poplars Avenue
Junction PH2 – Peel Hall site access ghost right turn priority junction with Poplars Avenue
Junction PH3 – Windermere Avenue priority junction with Poplars Avenue (sports club and community use sire access off Grasmere Avenue)
Junction PH4 – Mill Lane priority junction with Delph Lane (residential site access off Mill Lane)
Junction PH5 – Peel Hall site access roundabout junction with Mill Lane
Junction PH6 – Peel Hall Through Route A49/Poplars Avenue signalised junction

12.30 The SATURN data is summarised in AECOM technical note 'SATURN Modelling Results' dated 22 September 2017, which is contained in **Appendix 63** to this report for ease of reference.

12.31 The 2025 Do Minimum data has been compared with the 2025 Do Something results to identify what mitigation, if any, on the local highway network may be required in the interim build-out years.

12.32 The 2030 Do Minimum scenario has been compared against the 2030 Do Something and the 2030 Through Route scenarios; to again identify what mitigation may be required on the local highway network as a result of the Peel Hall development.

12.33 In terms of reviewing the significance of impact of the development traffic, the approach taken has been as follows:

i. Any junction results below an operational capacity of 85% have not been considered.
ii. Then the operation of each junction and the specific impact of the development traffic in terms of base results versus impact was considered.

iii. If the junction was already operating at above 90% in the Do Minimum scenario and our development showed a circa 1-2% impact in operational capacity with a small number of vehicles queuing, it was generally not assessed further beyond that shown in SATURN. This is because a 1-2% increase cannot be considered significant or severe, with an increase of only a few vehicles queueing where the road layout can accommodate these vehicles; especially when we are also proposing substantial bus mitigation measures and Travel Plan measures.

iv. Our approach to Junction 9 of the M62 is a little different to (iii) above, as one of the arms in the 2030 PM peak showed a capacity result of 123% for Do Something (with development) from 119% Do Minimum. However, this was not considered to constitute a severe impact when arms in the Do Minimum scenario are already operating at over 100% capacity, including the 2015 base model. Notwithstanding this, we have produced potential mitigation measures for HE to consider as it is understood from discussions that they have no plans currently for this junction but they are aware it is at/over theoretical operating capacity in the peak hours.

12.34 Another matter for consideration when assessing the severity of impact is that within the network modelling there is a wide choice of routes for existing and future car drivers. Therefore, drivers have a real choice and can avoid queues at certain locations on the network depending on conditions on a specific day i.e. dispersing traffic impact. If there is a choice of routes then it should not be considered that traffic impact is severe when looking at small increases – and junctions like the A49/A50 Long Lane for example would fall into that category. As a result, no mitigation has been proposed at this junction.

12.35 In summary, development traffic was generally considered to have a major to moderate adverse significance at a junction based on:

i. An increase in RFC of 5% or more for a Do Something scenario above a Do Minimum scenario RFC of 85% or more.
ii. An increase in RFC of 3% or more for a Do Something scenario above a DO Minimum scenario RFC of 90% or more.
iii. Where queue lengths are shown to increase in Do Something scenario beyond that of current stacking capacity on the existing network.
iv. Where junctions are shown to have a capacity of 85% or above in the Do Something scenario compared to results below 85% in the Do Minimum.

12.36 As per HTp Technical Note 1107/TN/22 (**Appendix 64**) the list of the junctions that show VoC of over 85% in the Base 2015 SATURN model are as follows:

Junction 1 - Winwick Link Road/Newton Road/A49
Junction 2 - A49/Delph Lane Retail Park
Junction 3 - M62 Junction 9
Junction 6 - A49/A50 Long Lane
Junction 8 - Blackbrook Avenue/Insall Road/Hilden Road
Junction 27 - Birchwood Way/Oakwood Gate

Do Minimum

12.37 A list of the junctions that show VoC of over 85% in the Do Minimum 2025 SATURN model are as follows (the junctions denoted in bold are in addition to those junctions operating at or over capacity in the base year of 2015, i.e. the highway network reaches capacity without development traffic):

Junction 1 - Winwick Link Road/Newton Road/A49
Junction 2 - A49/Delph Lane Retail Park
Junction 3 - M62 Junction 9
Junction 4 - Cromwell Avenue/Calver Road
Junction 5 - A49/Sandy Lane West
Junction 6 - A49/A50 Long Lane
Junction 8 - Blackbrook Avenue/Insall Road/Hilden Road
Junction 15 - A50 Orford Green/Poplars Avenue
Junction 24 - Birchwood Way/Blackbrook Avenue
Junction 26 - Birchwood Way/Crab Lane/Woolston Grange Avenue
Junction 27 - Birchwood Way/Oakwood Gate

12.38 A list of the junctions that show VoC of over 85% in the Do Minimum 2030 SATURN Model are as follows:

Junction 1 - Winwick Link Road/Newton Road/A49
Junction 2 - A49/Delph Lane Retail Park
Junction 3 - M62 Junction 9
Junction 4 - Cromwell Avenue/Calver Road
Junction 5 - A49/Sandy Lane West
Junction 6 - A49/A50 Long Lane
Junction 8 - Blackbrook Avenue/Insall Road/Hilden Road
Junction 24 - Birchwood Way/Blackbrook Avenue
Junction 26 - Birchwood Way/Crab Lane/Woolston Grange Avenue
Junction 27 - Birchwood Way/Oakwood Gate

12.39 It is noted that Junction 15 (A50 Orford Green/Poplars Avenue) has dropped out of this list shown in **paragraph 12.37**, this is due to the change in the proportion of traffic flows across the arms resulting in the junction working more efficiently.

Do Something

12.40 Junctions 1, 2, 4 and 26 show very minor (or no) increase from the Do Minimum scenarios in 2025 and 2030 and therefore, whilst these junctions may be approaching operational capacity, the development does not impact them significantly. It is not for this development to mitigate for existing deficiencies on the local highway network.

12.41 The details of the access strategy Option A in 2025 and 2030, and the 2030 Option B Through Route assessment results for the following junctions are summarised in HTp Technical Note 1107/TN/22 (contained at **Appendix 64**):

Junction 3 - M62 Junction 9
Junction 4 - Cromwell Avenue/Calver Road (retained as part of linked modelling for Junction 5)
Junction 5 - A49/Sandy Lane West
Junction 6 - A49/A50 Long Lane
Junction 8 - Blackbrook Avenue/Insall Road/Hilden Road
Junction 15 - A50 Orford Green/Poplars Avenue
Junction 20 - Capesthorne Road/Poplars Avenue
Junction 24 - Birchwood Way/Blackbrook Avenue
Junction 25 - Enfield Park Road/Crab Lane
Junction 26 - Birchwood Way/Crab Lane/Woolston Grange Avenue
Junction 10 - A49/Birch Avenue (2030 Through Route)
Junction 23 - Capesthorne Road/Blackbrook Avenue/Enfield Park Road
Junction 27 - Birchwood Way/Oakwood Gate

12.42 HTp report 1107/TN/22 provides a direct tabulated comparison of the Do Minimum and Do Something results, thereby highlighting the junctions to be modelled on an individual basis with PICADY, ARCADY (Junctions 9) and LinSig software.

12.43 The junctions taken forward for detailed modelling based on the significance of impact were as follows:

Junction 4 - Cromwell Avenue/Calver Road (modelled with Junction 5)
Junction 5 - A49/Sandy Lane West
Junction 8 - Blackbrook Avenue/Insall Road/Hilden Road
Junction 15 - A50 Orford Green/Poplars Avenue
Junction 20 - Capesthorne Road/Poplars Avenue
Junction 23 - Capesthorne Road/Blackbrook Avenue/Enfield Park Road
Junction 25 - Enfield Park Road/Crab Lane
Junction 26 - Birchwood Way/Crab Lane/Woolston Grange Avenue
Junction 27 - Birchwood Way/Oakwood Gate

12.44 The initial results of the detailed junction modelling are provided in the AECOM technical note contained in **Appendix 65** and summarised in **Section 14.0** with further modelling. The modelling was carried out for all future year Do Minimum and Do Something scenarios and for both access strategies.

12.45 It is understood that WBC have secured funding to carry out engineering and signalisation works to the Birchwood Way/Crab Lane/Woolston Grange Avenue (College Place) roundabout and for an additional signal scheme at the Birchwood Way/Oakwood Gate junction. These schemes will assist with relieving traffic congestion through this area of Warrington going forward. No information has been provided by WBC and therefore these junctions have not been tested beyond that contained in **Section 14.0**.

12.46 Those junctions requiring mitigation measures to be developed and tested are expanded on within **Section 15.0** of this report, and can be summarised here as follows:

Junction 5 - A49/Sandy Lane West
Junction 15 - A50 Orford Green/Poplars Avenue
Junction 20 - Capesthorne Road/Poplars Avenue
Junction 25 - Enfield Park Road/Crab Lane

12.47 It is considered that the results for junction 10, the A49 south/Birch Avenue priority junction, shown within the SATURN model for the 2030 Do Something through route scenario (see paragraph **12.41**) can be mitigated for with white Keep Clear markings on carriageway to ensure that vehicles leaving Birch Avenue can do so without significant delay. This is set out in more detail in **Section 15.0**.

12.48 Further to a meeting with HE in November 2017 (see **Appendix 4**) mitigation measures have also been investigated for the M62 Junction 9 roundabout. See **Section 15.0**.

Base Traffic Flow Changes

12.49 Base traffic flow changes have been provided in the Environmental Statement, which show that there are fluctuations in traffic flow on the M62 between Do Minimum and Do Something scenarios as a result of the development, with decreases in future predicted flows on some links. However, it can be noted that when looking at the total flow combined on each link the Do Something flows (with development traffic) are higher.

12.50 These fluctuations are considered to be general changes in traffic routing through the model as a result of the development and also as there is a real choice for drivers regarding the route they take. On other local network links, flows are shown to actually decrease for some Do Something scenarios also.

13.0 Capacity Assessments – Site Access Junctions

13.1 The site access junctions have been assessed using the SATURN flow data for a future design year of 2025 and 2030 under the Option A access strategy, and for a future design year of 2030 with the Option B Through Route access strategy.

13.2 The Saturn traffic flow output files are contained in **Appendix 66** for reference.

13.3 The relevant modelling reports for the site access junctions are contained in the following appendices:

i. Mill Lane/Blackbrook Avenue – **Appendix 67**
ii. Poplars Avenue (central) – **Appendix 68**
iii. Poplars Avenue (west) – **Appendix 69**
iv. Mill Lane/Delph Lane – **Appendix 70**
v. Birch Avenue/A49 Winwick Road – **Appendix 71**
vi. Option B – A49/Poplars Avenue – **Appendix 72**

13.4 The assessments have been carried out in standalone junction modelling packages. LINSIG has been used for modelling signalised road junctions and Junctions 8 and 9 comprise the ARCADY and PICADY software suites, which have been used to model roundabout and other priority junctions.

13.5 The modelling results for the site access junctions are provided in **Table 13.1** below.

Table 13.1 – Site access junction modelling results

Junction	AM Peak Hour			PM Peak Hour		
	Max RFC	M. Max Queue Length	Delay	Max RFC	M. Max Queue Length	Delay
2025 Option A						
Site Access – Mill Lane/Blackbrook Avenue	54%	1	5 s/pcu	38%	1	4 s/pcu
Site Access – Poplars Avenue (central)	23%	0	10 s/pcu	46%	1	21 s/pcu
Site Access – Poplars Avenue (west)	10%	0	7 s/pcu	10%	0	7 s/pcu
Site Access – Mill Lane/Delph Lane	41%	1	17 s/pcu	21%	0	15 s/pcu
Birch Avenue/A49 Winwick Road	14%	0	14 s/pcu	06%	0	8 s/pcu

Table 13.1 continued

Junction	AM Peak Hour			PM Peak Hour		
	Max RFC/VoC/ DoS	M. Max Queue Length	Delay	Max RFC	M. Max Queue Length	Delay
2030 Option A						
Site Access – Mill Lane/Blackbrook Avenue	60%	2	7 s/pcu	47%	1	5 s/pcu
Site Access – Poplars Avenue (central)	27%	0	10 s/pcu	34%	1	14 s/pcu
Site Access – Poplars Avenue (west)	10%	0	7 s/pcu	10%	0	7 s/pcu
Site Access – Mill Lane/Delph Lane	44%	1	19 s/pcu	23%	0	16 s/pcu
Birch Avenue/A49 Winwick Road	15%	0	15 s/pcu	06%	0	9 s/pcu
2030 Option B Through Route						
Site Access – Mill Lane/Blackbrook Avenue	64%	2	7 s/pcu	51%	1	5 s/pcu
Site Access – Poplars Avenue (central)	13%	0	9 s/pcu	12%	0	8 s/pcu
Poplars Avenue /A49	81.1%	10	28 s/pcu	74.2%	13	34 s/pcu
Site Access – Mill Lane/Delph Lane	47%	1	21 s/pcu	23%	0	17 s/pcu
Birch Avenue/A49 Winwick Road	15%	0	15 s/pcu	06%	0	9 s/pcu

13.5 From the above **Table 13.1** it can be seen that the site access junctions work well within capacity for Option A in 2025 and 2030, and Option B in 2030.

A49/Poplars Avenue

13.6 The Poplars Avenue/A49 signal junction has been optimised for PRC with cycle times of circa one minute. Cycle Time Optimisation identified these as more efficient than the longer cycle e.g. 90 seconds, and therefore maximum queues would be expected to be shorter.

13.7 In any event the three lanes provided on the A49 for southbound traffic ensures all forecast queues can be accommodated within all arms of the proposed junction. This ensures that the proposed junction is unlikely to significantly impact delay at the M62 Junction 9 due to blocking-back.

Birch Avenue

13.8 It is apparent that blocking back does occur on the A49 at the Birch Avenue junction. Keep Clear markings on the nearside lane of the A49 are proposed in **Section 15.0**, in order to improve access to the A49 dual carriageway (southbound) at the Birch Avenue junction and to assist with mitigation for the traffic likely to arise at this junction from the proposed 20 dwellings as part of the Peel Hall development.

14.0 Capacity Assessments – Off-Site Junctions

14.1 As set out in **Section 12.0**, the off-site junctions to be considered for further detailed modelling were:

Junction 4 - Cromwell Avenue/Calver Road (modelled with Junction 5)
Junction 5 - A49/Sandy Lane West
Junction 8 - Blackbrook Avenue/Insall Road/Hilden Road
Junction 15 - A50 Orford Green/Poplars Avenue
Junction 20 - Capesthorne Road/Poplars Avenue
Junction 25 - Enfield Park Road/Crab Lane
Junction 26 - Birchwood Way/Crab Lane/Woolston Grange Avenue
Junction 23 - Capesthorne Road/Blackbrook Avenue/Enfield Park Road
Junction 27 - Birchwood Way/Oakwood Gate

14.2 However, it was confirmed by WBC highway officers in early January 2018 that recent works to the Insall Road junction to provide two-lane entries and improvements to the signal staging had been carried out. The modelling below reflects the recent works and signal staging.

14.3 Further to the initial detailed modelling review carried out by AECOM (results contained in **Appendix 65**) and the results contained in the SATURN traffic flow data spreadsheets (**Appendix 66**), further modelling has also been carried out (**Appendix 73**). The cumulation of these results are provided in this section and include Junction 9 of the M62.

Option A Access Strategy

14.4 The results for the off-site junction modelling for Option A are summarised in **Table 14.1** for 2025 traffic flows and **Table 14.2** for 2030 traffic flows.

Table 14.1 – Wider highway network capacity assessments Option A 2025

Junction	Without Development		With Development	
	Max RFC/VoC/ DoS	Mean Max Queue Length	Max RFC/VoC/ DoS	Mean Max Queue Length
A49/Sandy Lane West/Calver Road	90.4%	24	94.1%	28
Blackbrook Avenue/Insall Road/Hilden Road	57.4%	11	63.1%	13
A50 Orford Green/Hilden Road/Poplars Avenue	-*	112	-*	98

***Cannot be provided with lane simulation within Junctions 9 software**

Table 14.1 continued (Option A 2025)

Junction	Without Development		With Development	
	Max RFC/VoC/ DoS	Mean Max Queue Length	Max RFC/VoC/ DoS	Mean Max Queue Length
Capesthorne Road/Poplars Avenue	70%	2	94.0%	12
Birchwood Way/Blackbrook Avenue	67.0%	2	72.0%	3
Enfield Park Road/Crab Lane	67.0%	2	96.0%	13
Birchwood Way/Crab Lane/Woolston Grange Avenue	84.7%	22	89.0%	23
Birchwood Way/Oakwood Gate/Birchwood Park Avenue	86.1%	15	87.5%	17
Junction 9 M62 (*Saturn Data*)	135%	109	117%	143

Table 14.2 – Wider highway network capacity assessments Option A 2030

Junction	Without Development		With Development	
	Max RFC/VoC/ DoS	Mean Max Queue Length	Max RFC/VoC/ DoS	Mean Max Queue Length
A49/Sandy Lane West/Calver Road	90.4%	27	97.1%	30
Blackbrook Avenue/Insall Road/Hilden Road	59.4%	12	65.9%	14
A50 Orford Green/Hilden Road/Poplars Avenue	-*	84	-*	131
Capesthorne Road/Poplars Avenue	79.0%	4	96%*	15
Birchwood Way/Blackbrook Avenue	70.0%	2	74%	3
Enfield Park Road/Crab Lane	75.0%	3	102%	26

***Cannot be provided with lane simulation within Junctions 9 software**

Table 14.2 continued (Option A 2030)

Junction	Without Development		With Development	
	Max RFC/VoC/ DoS	Mean Max Queue Length	Max RFC/VoC/ DoS	Mean Max Queue Length
Birchwood Way/Crab Lane/Woolston Grange Avenue	90.5%	30	92.7%	31
Birchwood Way/Oakwood Gate/Birchwood Park Avenue	88.4%	17	93.1%	18
Junction 9 M62 (*Saturn Data*)	119%	121	123%	143

14.5 From the above two tables it can be seen that the Enfield Park Road/Crab Lane junction, the Sandy Lane West junction, the Capesthorne Road/Poplars Avenue junction, and the A50 Orford Green/Hilden Road require further investigation in terms of mitigation measures. This is set out further in **Section 15.0**. However, the Enfield Park Road/Crab Lane junction is also considered further in **paragraphs 14.8** to **14.10**.

Option B Access Strategy

14.6 The results for the off-site junction modelling for Option B are summarised in **Table 14.3** with 2030 flows.

Table 14.3 – Wider highway network capacity assessments Option B 2030

Junction	Without Development		With Development	
	Max RFC/VoC/ DoS	Mean Max Queue Length	Max RFC/VoC/ DoS	Mean Max Queue Length
A49/Sandy Lane West/Calver Road	90.4%	27	89.6%	29
Blackbrook Avenue/Insall Road/Hilden Road	59.4%	12	65.8%	14
A50 Orford Green/Hilden Road/Poplars Avenue	-*	84	-*	133
Capesthorne Road/Poplars Avenue	79.0%	4	79.0%	4
Birchwood Way/Blackbrook Avenue	70.0%	2	74.0%	3

***Cannot be provided with lane simulation within Junctions 9 software**

Table 14.3 continued (Option B 2030)

Junction	Without Development		With Development	
	Max RFC/VoC/ DoS	Mean Max Queue Length	Max RFC/VoC/ DoS	Mean Max Queue Length
Enfield Park Road/Crab Lane	75.0%	3	102.0%	24
Birchwood Way/Crab Lane/Woolston Grange Avenue	90.5%	30	94.7%	26
Birchwood Way/Oakwood Gate/Birchwood Park Avenue	88.4%	17	94.0%	19
Junction 9 M62 (*Saturn Data*)	119%	121	123%	119

14.7 From the above **Table 14.3** it can be seen that the through route Option B scenario does not have a significant impact on the operation of the A49/Sandy Lane West junction, but that the Enfield Park Road/Crab Lane junction and the A50 Orford Green/Hilden Road junction require further investigation in terms of mitigation measures. This is set out further in **Section 15.0**.

14.8 It has been noticed that the SATURN flows for the Enfield Park Road/Crab Lane junction did not appear to reflect the existing situation and therefore a MCC was carried out on Thursday 14th December to ascertain current traffic movements at this junction. The surveyor confirmed that there was no bad weather disrupting the survey in that area. The data is contained in **Appendix 74**, complete with a summary sheet comparing the data to the 2016 ATC data for Enfield Park Road (see data contained in **Appendix 9**).

14.9 The revised modelling for this junction using the MCC data and Peel Hall development traffic flows extracted from the SATURN output files (**Appendix 66**) is contained in **Appendix 75** and summarised below in **Table 14.4** for a 'without growth' assessment (further to the discussion in **Section 10.0**). The future year reference relates to the level and distribution of development traffic for the purposes of this assessment.

Table 14.4 – Enfield Park Road/Crab Lane revised modelling

Enfield Park Road/Crab Lane	Without Development		With Development	
	Max RFC	Mean Max Queue Length	Max RFC	Mean Max Queue Length
Baseline (2017 flows)	82%	4	-	-
Option A				
2025 Peel Hall Traffic	-	-	109%	33
2030 Peel Hall Traffic	-	-	113%	52
Option B				
2030 Through Route Peel Hall Traffic	-	-	118%	67

14.10 From the above **Table 14.4** it can be seen that the junction will require mitigation to offset the impact of the Peel Hall development traffic. This is investigated in **Section 15.0**.

15.0 Proposed Mitigation Measures

15.1 There is a range of mitigation measures proposed as part of the Peel Hall development comprising highway mitigation measures, a new and high quality bus route serving the site between Warrington town centre and Birchwood and an umbrella Framework Travel Plan.

15.2 There is no expectation in planning policy that development should mitigate for existing transport problems and the test in paragraph 32 of the NPPF sets out that development should only be refused on transport ground where the residual cumulative impacts are severe. Therefore, the approach that has been taken is to mitigate for development impact arising from the Peel Hall development.

Highway Mitigation Measures

15.3 As a result of the capacity assessments, the junctions to be considered for mitigation are:

Junction 5 - A49/Sandy Lane West (Option A only)
Junction 15 - A50 Orford Green/Poplars Avenue
Junction 20 - Capesthorne Road/Poplars Avenue (Option A only)
Junction 25 - Enfield Park Road/Crab Lane

15.4 In addition to the above, we have also considered the impact of the proposed Option B through route signalised junction of Poplars Avenue onto the A49 Winwick Way on the operation of the Birch Avenue priority junction and also considered a mitigation package for the M62 Junction 9 roundabout that would result in funding being provided to assist with alleviating existing and future capacity issues.

15.5 The highway ownership information for these junctions has been obtained and provided in **Appendix 76** for reference.

15.6 The proposed mitigation plans for the WBC highway network are contained in **Appendix 77** for Option A and in **Appendix 78** for Option B (duplicated for ease of reference).

15.7 The mitigation measures to be considered for Option A are:

i. A49/Sandy Lane West – Widening of the Sandy Lane West approach to three lanes and other minor kerb realignments and associated adjustments to road markings.
ii. A50 Orford Green/Poplars Avenue – Widening of the Poplars Avenue priority junction to two-lane entry (left only), removal of build out of the Orford Green entry arm to the roundabout, widening the Orford Road approach to two lanes (entry and exit) and creating a two-lane circulatory. Adjustments to cycle facilities where required.
iii. Capesthorne Road/Poplars Avenue – Widening on the Capesthorne eastern arm to two lane entry and reduction in the central island diameter.

iv. Enfield Park Road/Crab Lane – A three-arm single lane approach signalised junction with controlled pedestrian facility over the Crab Lane arm.
v. Birch Ave/A49 – Provision of Keep Clear markings on the A49 nearside southbound lane across the Birch Avenue junction.

15.8 The mitigation measures to be considered for Option B are:

i. A50 Orford Green/Poplars Avenue – Widening of the Poplars Avenue priority junction to two-lane entry (left only), removal of build out of the Orford Green entry arm to the roundabout, widening the Orford Road approach to two lanes (entry and exit) and creating a two-lane circulatory. Adjustments to cycle facilities where required. This is as per point **15.10 (ii)** above.
ii. Enfield Park Road/Crab Lane – A three-arm single lane approach signalised junction with controlled pedestrian facility over the Crab Lane arm. This is as per point **15.10 (iv)** above.
iii. Birch Ave/A49 – Provision of Keep Clear markings on the A49 nearside southbound lane across the Birch Avenue junction. This is as per point **15.10 (v)** above

15.9 The mitigation measures to be considered for Junction 9 of the M62 comprise a funding contribution towards widening of the A49 southbound entry radius and circulatory to the eastbound on-slip, creating a two-lane slip road (as per the westbound on-slip) prior to the lane gain, and widening of the westbound off-slip entry to the roundabout from two to three lanes. The proposed mitigation plans are contained in **Appendix 79**.

Mitigation Modelling – Option A

15.10 The modelling to support the mitigation proposals on the local highway network has been carried out and this is summarised in **Table 15.1** (2025) and **Table 15.2** (2030). The output files are contained in **Appendix 80** for reference.

Table 15.1 – Mitigation modelling for Option A 2025

Junction	With Development	
	Max RFC/VoC/ DoS	Max Queue Length
A49/Sandy Lane West/Calver Road	83.2%	14
A50 Orford Green/Hilden Road/Poplars Avenue	-*	40
Capesthorne Road/Poplars Avenue	58.0%	1

***Cannot be provided with lane simulation within Junctions 9 software, see results in Appendix 81 for further reference**

Table 15.2 - Mitigation modelling for Option A 2030

Junction	With Development	
	Max RFC/VoC/ DoS	Max Queue Length
A49/Sandy Lane West/Calver Road	87.3%	15
A50 Orford Green/Hilden Road/Poplars Avenue	-*	49
Capesthorne Road/Poplars Avenue	59.0%	1

*** Cannot be provided with lane simulation within Junctions 9 software, see results in Appendix 81 for further reference**

15.12 From the above tables it can be seen that the proposed mitigation measures improve the operation of the junctions; reducing the development impact at all junctions to below Do Minimum levels when compared to **Tables 14.1** and **14.2** in **Section 14.0**.

15.13 The Enfield Park Road/Crab lane junction results are provided separately in **Table 15.4** below.

Mitigation Modelling – Option B

15.14 The modelling to support the mitigation proposals has been carried out for Option B, and this is summarised in **Table 15.3** below. The output files are also contained in **Appendix 80**.

Table 15.3 - Mitigation modelling for Option B 2030

Junction	With Development	
	Max RFC/VoC/ DoS	Max Queue Length
A50 Orford Green/Hilden Road/Poplars Avenue	-*	47
Capesthorne Road/Poplars Avenue	56.0%	1

*** Cannot be provided with lane simulation within Junctions 9 software, see results in Appendix 81 for further reference**

15.15 From the above **Table 15.3** it can be seen that the proposed mitigation measures improve the operation of the junctions; reducing the development impact at all junctions to below Do Minimum levels shown in **Table 14.2**.

Mitigation Modelling – Enfield Park Road/Crab Lane (Option A and Option B)

15.16 The modelling of the Crab Lane mitigation is set out in **Table 15.4** for each of the future year scenarios using the flow data set out in **paragraphs 14.8 to 4.10**. The output files are contained in **Appendix 75**.

15.17 An assumption has been made that the pedestrian cycle will be called at most every other cycle (i.e. every four minutes) for the purposes of the mitigation modelling. In reality this level of frequency is unlikely be higher given the location of the junction.

Table 15.4 – Enfield Park Road/Crab Lane mitigation modelling

Enfield Park Road/Crab Lane	Max RFC/VoC/ DoS	Max Queue Length
Do Something 2025 Option A	83.8%	20
Do Something 2030 Option A	84.2%	22
Do Something 2030 Option B Through Route	86.4%	23

15.18 From the results in **Table 15.4** above it can be seen that the proposed mitigation measures will work satisfactorily.

15.19 A Stage 1 Road Safety Audit of the mitigation measures has been carried out. This is contained in **Appendix 35** with the Designer's Response. It can be concluded that the design of the mitigation measures proposed are appropriate.

Bus-Based Mitigation Measures

15.20 The bus mitigation proposals are set out in **Section 6.0**. In essence, the aim of the Peel Hall bus strategy is to stimulate and maintain a transfer of trips from car travel to bus travel by creating genuine modal choice and a desire to use the available, high quality bus service that provides a realistic alternative to the private car for trips between the site, Warrington town centre and Birchwood. This result in a sustainable development.

15.21 This new service will also be attractive to existing residents along the route, particularly in terms of providing a service to the residential areas to the northeast of Warrington i.e. to provide a better connection to the town centre and Birchwood railway station, as well as providing a service to the east for those residents living in a more central location out to the Birchwood Park employment area.

15.22 Even without the new bus service in place, there would be an element of bus-based travel arising from the Peel Hall development. However, it is considered that, due to the size of the site and location of existing services and employment opportunities, the new bus service can be expected to generate a high level of trip transfer. This will facilitate a lower level of car traffic to arise from the development than forecast in the traffic modelling.

15.23 The potential trip transfer could be calculated by the following:

i. At present Network Warrington buses generally use 39-seat (10.85m long, 5.5m wheel base) and 45-seat (12.15m long, 6.1m wheel base) vehicles.
ii. There will be three buses in each direction during the peak hours; six in total.
iii. Therefore, there will be 234 seats available for trip transfer during any given peak hour as a minimum; based on a 39-seater bus and not taking into account that some seats are reused during a single journey as passengers get on and off the bus at various points along the route.
iv. If, with consideration of the route path to either destination, we assume that around 55% of these seats are filled by Peel Hall residents, this could be around 129 seats taken per peak hour. Assuming 1.5 people per car this would equate to around 86 fewer vehicles from the Peel Hall site than modelled for, thereby reducing the development impact on the local highway network.

15.24 In summary, it is considered that the bus-based mitigation proposed will provide a real benefit to the existing Warrington residents as well as future residents of Peel Hall because there will be an increased level of bus service provision; a service provision between Birchwood and the Town Centre that reaches the north-eastern areas of Warrington where there is currently an under provision. It can be expected that there will be modal shift from the private car to public transport and the increase in bus travel will help off-set the development traffic impact.

15.25 Furthermore, the effect of the bus-related travel plan measures proposed and the future bus route have not been modelled as part of the capacity assessments. It can be considered that the modelling which suggests that mitigation is required is therefore robust.

15.26 It is our conclusion, there are no locations where the impact arising from the development is severe following the introduction of our mitigation measures.

16.0 Section 106 Heads

16.1 The Section 106 heads and obligations comprise:

i. The bus measures set out in **Section 6.0**.
ii. The provision of sustainable travel vouchers to residents upon first occupation to the value of £250, which can be used towards the purchase of public transport tickets and/or cycle/cycle accessories, as set out in **paragraph 4.28**.
iii. An umbrella Framework Travel Plan to secure Travel Plans/Travel Plan Statements for each land use (residential, employment, retail, school and care home) as set out in **paragraph 4.26**.
iv. Highway mitigation works as set out in **Section 15.0**.
v. Construction Management Plan as described in **paragraph 7.9**.

16.2 A Section 278 Agreement would be entered into between the developer and the council for the construction and delivery of the site access junctions.

16.3 The off-site junction obligations are anticipated to be a mixture of Section 278 works and financial contributions depending on location.

17.0 Summary and Conclusions

Summary

17.1 Highgate Transportation have been commissioned by Satnam Millennium Limited to provide transportation advice in support of their proposals for a new residential neighbourhood on land at Peel Hall in Warrington.

17.2 For the purposes of this transport assessment the development is assumed to comprise up to 1,200 residential dwellings, an area of employment, a local centre with food store, a care home, a two-form entry primary school and the relocation and upgrading of existing sports pitches with ancillary facilities. The assessment includes consideration of the on-site highway and access requirements, all modes of transport and the demands placed on the local and wider highway network.

17.3 There are two access strategy options for consideration:

i. The non-through route access strategy, with the development served off five separate access points including a new roundabout from Mill Lane in the east. This is the strategy that was proposed with the planning application and is referred to as Option A.
ii. The through route access strategy that connects the proposed new roundabout junction on Mill Lane with the A49 in the west via a new signalised junction on Poplars Avenue. This strategy is referred to as Option B.

17.4 This Transport Assessment (HTp/1107/TA/01/A) supersedes the Transport Assessment (TA/01) that supported the planning application in 2016; TA/01/A is the updated report that reflects the progress made with the area-wide transport modelling and subsequent mitigation proposals.

17.5 Discussions were held with WBC and HE at an early stage to scope out the assessment. The study area was agreed in January 2016 and updated in September 2016 at the request of WBC officers.

17.6 Extensive discussions have also been held with Network Warrington concerning how to best serve the development by bus.

17.7 The guiding principles in the development of the scheme have been to encourage the use of sustainable modes of transport and to contain trips within the development as far as possible. This is achieved by the mixed-use nature of the development and high level of permeability and connectivity throughout the site. Another guiding principle has been the need to protect the existing residential area to the south of the site from development traffic.

17.8 As part of the development proposals, mitigation measures have been identified in the form of a new comprehensive and attractive bus service that will connect the site with the town centre in the south and Birchwood to the east, and a range of engineering measures at local junctions. The development will also be supported by extensive Travel Plan measures.

17.9 The proposed new high quality bus service will provide a genuine modal choice for the future residents of the Peel Hall site, creating a link not only to the wider area for employment, retail and leisure but also across the site; supported by an excellent network of pedestrian and cycle routes throughout the development that will also link into the wider area.

17.10 The methodology used in the Transport Assessment generally follows the guidelines set out in the Guidance on Transport Assessment published by the Department for Transport (DfT) and the Department for Communities and Local Government (DCLG).

17.11 WBC and HE requested in 2016 that the assessment for Peel Hall was to follow what had been agreed for the Omega South (Zones 3-6) planning application (ref: 2015/26469).

17.12 It became increasingly apparent that the VISSIM program could not adequately cope with the data, not least due to the number of route choices available on the Peel Hall network modelled. It was therefore agreed in early 2017 that an approach using SATURN would be the most acceptable way forward in order to extract flow data for detailed modelling of individual junctions. SATURN is a software package used for undertaking traffic analysis on large and/or congested highway networks.

17.13 A full accident review has been carried out and all road users considered in this assessment. Two independent Stage 1 Road Safety Audits have been carried out and the recommendations generally accepted, or where otherwise the design supported with additional information.

17.14 The local and wider highway network has been modelled in SATURN with further standalone junction analysis where the SATURN modelling showed:

i. An increase in RFC of 5% or more for a Do Something scenario above a Do Minimum scenario RFC of 85% or more.
ii. An increase in RFC of 3% or more for a Do Something scenario above a DO Minimum scenario RFC of 90% or more.
iii. Where queue lengths are shown to increase in Do Something scenario beyond that of current stacking capacity on the existing network.
iv. Where junctions are shown to have a capacity of 85% or above in the Do Something scenario compared to results below 85% in the Do Minimum.

17.15 The highway works mitigation measures proposed have generally resulted in junction operational levels being reduced to Do Minimum results, therefore it is considered that the transport impact of the Peel Hall site cannot be considered severe with the proposed measures. Furthermore, the Travel Plan measures combined with the comprehensive and attractive new bus service will further reduce the impact of the development site on the local and wider highway network and encourage a genuine choice of sustainable travel modes.

Conclusions

17.16 This report concludes that the proposals represent sustainable development in transport terms, and that in accordance with Paragraph 32 of the National Planning Policy Framework (NPPF) improvements can be undertaken within the transport network that effectively limit the significance of impact arising from the development of the Peel Hall site.

17.17 This Transport Assessment finally concludes that the proposed development at Peel Hall is acceptable in highway and transport terms.