4 SUSTAINABLE TRANSPORT OPTIONS

4.1 Introduction

4.1.1 New residential schemes should, where possible, be located to optimise the use of alternative travel modes to the private car. Sustainable modes such as cycling and walking should be encouraged wherever possible for shorter journeys.

4.1.2 The NPPF provides useful guidelines on the location of new development whilst balancing the needs of the local community- notably;

Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised…developments should be located and designed where practical to:

- *give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;*
- *create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones.*

4.1.3 As discussed in Chapter 2, the Former Greenhill Nursery site has been considered in context of the NPPF guidelines.

4.2 Pedestrian Accessibility

4.2.1 There are two main pedestrian access points to the site. Footways are provided alongside the vehicular access from Greenhill Road, and pedestrians would be able to utilise the emergency access route onto Nursery Lane.

4.2.2 Pedestrian accessibility to the site is good with illuminated footways present on the main roads around the site providing links to local amenities. There are dropped crossing points and tactile paving on all arms of the northern and southern roundabouts.

4.2.3 There is excellent pedestrian linkage from the site to the Liverpool South Parkway transport interchange which is a distance of approximately 850m to the south of the site.

4.2.4 It is commonly accepted that walking is the most important mode of travel at the local level and offers the greatest potential to replace short car trips, particularly those journeys under 2km in distance.

4.2.5 The application site is located within 800m of key amenities such as Grocery stores, a Post Office, Pharmacy, Leisure Centre and Recreation Ground. These are shown in **Figure 3.**

4.2.6 The site is also located within 800m walking distance of Gilmour Infant School, Clarendon Nursery and Clarendon College Montessori School.

4.3 Cycling Accessibility

4.3.1 The DfT *'Local Transport Note 2/08 Cycling Infrastructure Design'*, states that many utility cycle trips are less than three miles (4.8 kilometres), but for commuter journeys a distance of over five miles (8 kilometres) is not uncommon. Cycling is frequently promoted as a viable alternative to car trips, especially when connecting to public transport hubs.

4.3.2 Whilst there is no off-street cycle infrastructure within the immediate vicinity of the site, there are good off-road and on-road cycle tracks links from Liverpool South Parkway (850m) connecting to Speke Road, New Mersey Retail Park (2.5km), Liverpool John Lennon Airport (5.2km) and Speke Industrial Park (5.5km). The existing cycle routes (yellow = on road, brown = off-road) are shown in **Figure 4** below.

Figure 4 – Existing Cycle Routes

4.3.3 Given the proximity of the site to the Liverpool South Parkway transport hub and a number of key employment areas, cycling for commuting or public transport connections is clearly a viable alternative to the private car.

4.4 Public Transport – Bus

4.4.1 Guidelines for public transport accessibility recommend that development should be located within a 400m walk of facilities (CIHT, 1999).

4.4.2 There are a total of 6 bus stops located with 400m walk catchment of the site. These are shown on **Figure 5**. The bus stop facilities located on the northbound side of Long Lane and Brodie Avenue comprise of a shelter, bus stop kerbs and lay-by. The bus stop facilities located on the southbound side of Long Lane and Brodie Avenue comprise of a flag pole, bus stop kerbs and lay-by. The bus stop facilities located on Heath Road consist of a flag pole only. **Table 4.2** below summarise the routes and times for these bus stops.

Bus Stop Location	Service Number	Route	Mon-Fri	Saturday	Sunday	Operator
Long Lane (opposite Dinesen Road)	80	CITY CENTRE (Liverpool One)	0609,0632,0652,0712,0732,0749 then every 20mins until 1829	0632,0652,0712, 0732,0749 then every 20mins until 1829	No Service	Arriva
	80A	CITY CENTRE (Liverpool One)	0625,0643,0703,0723,0743,0800,0820,0840 then every 20mins until 1840,1857 then every 30mins until 2227, 2257	0625,0643,0703, 0723,0743,0800, 0820,0840 then every 20mins until 1840,1857 then every 30mins until 2227,2257	0727.0758,0827, 0857 then every 20mins until 1857, then every 30mins until 2227, 2257	Arriva
	201	ROYAL LIVERPOOL HOSPITAL	No Service until, 1341, 1509,1819	No Service until, 1341, 1509,1819	No Service until, 1341, 1501,1806	Merseytravel
	266	GARSTON CIRCULAR	Hourly from 0737 until 1637	Hourly from 0837 until 1737	No Service	HTL Buses
Long Lane (Dinesen Road	80/80E	SPEKE (Morrisons Store)	0747 then every 20mins until 0707,0728,0748	0747 then every 20mins until 0707,0728,0748	No Service	ARRIVA
	80A	LIVERPOOL JOHN LENNON AIRPORT	0718,0733,0753,0816,0836,0856 then every 20mins until 1916,1928,1953 then every 30mins until 1223	0733,0753,0816, 0836,0856 then every 20mins until 1916,1928,1953 then every 30mins until 1223	0758,0828,0858, 0928,0958 then every 20mins until 1858,1923,1953 then every 30mins until 1223	ARRIVA
	201	Speke (Morrisons Store)	No Service until, 1603,1733,2007	No Service until, 1603,1733,2007	No Service until, 1552,1709,2007	Merseytravel
	288	Garston Circular	0759 then every hour until 1759	0759 then every hour until 1859	No Service	HTL Buses
Brodie Avenue (Long Lane)	80	CITY CENTRE (Liverpool One)	0610,0633,0653,0713,0733,0750 then every 20mins until 1830	0610,0633,0653, 0713,0733,0750 then every 20mins until 1830	No Service	Arriva
	80A	CITY CENTRE (Liverpool One)	0626,0644,0704,0724,0744,0801,0821,0841 then every 20mins until 1841,1858 then every 30mins until 2228, 2258	0626,0644,0704, 0724,0744,0801, 0821,0841 then every 20mins until 1841,1858 then every 30mins until 2228, 2258	0728.0759,0828, 0858 then every 20mins until 1858, then every 30mins until 2228, 2258	ARRIVA
	201	ROYAL LIVERPOOL HOSPITAL	No Service until, 1342, 1510,1820	No Service until, 1342, 1510,1820	No Service until, 1342, 1502,1807	Merseytravel
Brodie Avenue (Shirley Road)	80/80E	SPEKE (Morrisons Store)	0746 then every 20mins until 0706,0727,0747	0746 then every 20mins until 0706,0727,0747	No Service	ARRIVA
	80A	LIVERPOOL JOHN LENNON AIRPORT	0717,0732,0752,0815,0835,0855 then every 20mins until 1915,1927,1952	0732,0752,0815, 0835,0855 then every 20mins until	0757,0827,0857, 0927,0957 then every 20mins until	ARRIVA

Bus Stop Location	Service Number	Route	Mon-Fri	Saturday	Sunday	Operator
			then every 30mins until 1222	1915,1927,1952 then every 30mins until 1222	1857,1922,1952 then every 30mins until 1222	
	201	Speke (Morrisons Store)	No Service until, 1602,1732,2006	No Service until, 1602,1732,2006	No Service until, 1551,1708,2006	Merseytravel
Heath Road (Clifton Court)	266	Garston Circular	0738 then every hour until 1638	0838 then every hour until 1738	No Service	HTL Buses
Heath Road (Stamfordham Drive)	288	Garston Circular	0758 then every hour until 1758	0758 then every hour until 1858	No Service	HTL Buses

Table 4.2 Existing Bus Services with 400m Walk Catchment

4.4.3 The routes and services are shown in **Figure 6** below taken from an extract of Merseytravels route bus network map.

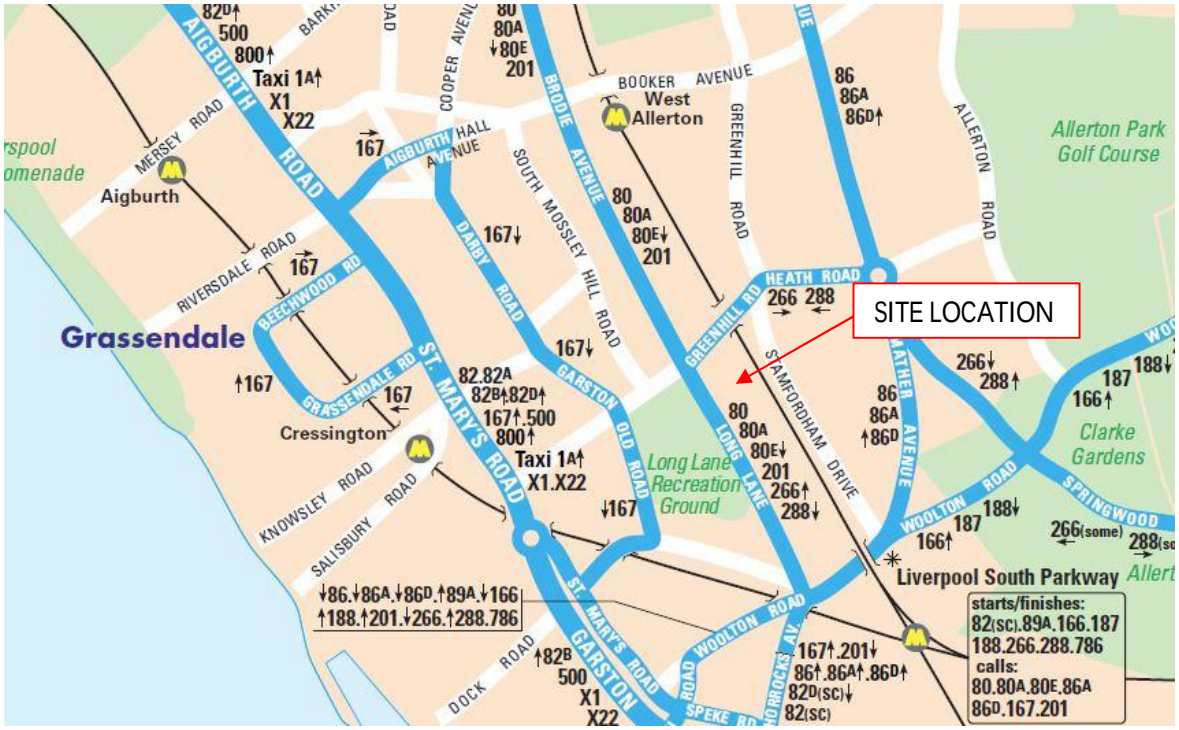


Figure 6 – Existing Bus Routes and Services

4.4.4 The above information demonstrates that the site is accessible by bus and the existing bus network provides excellent opportunities for residents to use the bus instead of private car trips.

4.5 Public Transport – Rail

4.5.1 As previously mentioned and shown on **Figure 5**, Liverpool South Parkway railway station is located approximately 850m walk distance from the site. Liverpool South Parkway is located on Merseyrail's Northern Line, the City Line and West Coast Main Line. Train services to Liverpool, Crewe, Birmingham, Runcorn, Manchester Oxford Road, Sheffield, Nottingham and Norwich are

available from this station. **Table 4.3** below indicates rail destinations along with indicative frequencies. The site is also located within a similar distance to West Allerton station, which offers less frequent services than Liverpool South Parkway.

Destination	Frequency	Journey Time
Liverpool	Every 15mins from 0609-2345	Direct 14mins
Crewe	Every 30mins from 0640-2346	Direct 30mins
Birmingham	Every 30mins from 0640-2144	Direct 1hr 35mins
Runcorn	Every 30mins from 0640-2346	Direct 10mins
Manchester Oxford Road	Every 20mins from 0632-2240	Direct 35min to 1hr
Sheffield	Every 30mins from 0632-2240	Direct 1hr 30mins
Nottingham	Every hour from 0657-2147	Direct 2hrs 30mins
Norwich	Every 15mins from 0640-1944	Direct 5hrs 10mins

Table 4.3 Existing Rail Services from Liverpool South Parkway

4.5.2 It can be seen from **Table 4.3** that Liverpool South Parkway provides a frequent service to Liverpool Central station. There are also good links to key cities in the Northwest region.

4.6 Minimum Accessibility Standard Assessment (MASA)

4.6.1 In accordance with the requirements set out in Ensuring a Choice of Travel SPD, a MASA has been undertaken; this is included in **Appendix E.**

4.6.2 The MASA has been completed for 'C3 Dwellings' development type, 'Other Urban' location and 'Major' development size. The results are as follows;

- Walking — Minimum requirement – 4 — Actual Score - 4
- Cycling — Minimum requirement – 5 — Actual Score - 5
- Public Transport — Minimum requirement – 5 — Actual Score - 3
- Vehicular Access and Parking — Minimum requirement – 1 — Actual Score - 1

4.6.3 The proposed development is shown to meet all requirements with the exception of 'public transport. Whilst the development is not located within 200m of a bus stop, there are 6 bus stops within 400m. These bus stops are served by high frequency routes and so it is not considered necessary for additional contributions to the services. In addition, Liverpool South Parkway and West Allerton stations are located with 850m walking distance from the site. The public transport accessibility to the site is therefore considered to be very good.

4.7 Summary

4.7.1 This chapter has considered the proposed development site in terms of accessibility to sustainable modes of travel. In summary, the following conclusions can be drawn;

- The proposed development site is considered to be in a highly accessible location in terms of pedestrian links to local amenities, and public transport options;
- Cycling for commuting or public transport connections is a viable alternative to the private car, with key shopping, transport and employment destinations all within 8km distance;
- Bus stops within 400m of the site provide frequent services to Liverpool City Centre and the surrounding areas; and
- Liverpool South Parkway interchange which is 850m from the site provides excellent rail links across northwest England and beyond.

4.8 Promoting Smarter Choices via Travel Plans

4.8.1 In order to manage the travel by residents at the new development, the applicant wishes to offer a Framework Travel Plan (FTP) to encourage travel to the site by non-car modes. The objective of the FTP is to encourage residents to travel by bus, on foot and by bicycle.

4.8.2 The effectiveness of FTPs in assisting the use of non-car modes for journeys to work is intrinsically linked to the accessibility of a given site by means other than the private car.

4.8.3 The proposed site has been shown to benefit from very good non-car accessibility and it should therefore be expected that the adoption of a FTP as early as possible to new residents would be particularly effective. As a consequence, a FTP has been prepared and is presented in **Appendix F**.

5 PROPOSED DEVELOPMENT

5.1 Built Development Proposals

5.1.1 The proposed residential development comprises of 83 dwellings including 3 bed mews and 3 and 4 bed detached properties.

5.1.2 The proposed development site layout plan is shown in **Appendix G.**

5.2 Vehicular Access Proposals

5.2.1 The site was formally accessed via Greenhill Road and Nursery Lane as shown in **Photos 3.1** and **3.2** in Chapter 3. The proposed priority junction access point to the development is in a similar position to the existing access point on Greenhill Road. The proposed priority access arrangement is shown in **Figure 7.**

5.2.2 The proposed kerblines can accommodate vehicles which will use the junction most frequently whilst also allowing a Fire Tender and a Large Refuse vehicle to enter and exit the site safely. These swept paths are shown in **Figure 8**. It is important to consider the fact these larger vehicles will be low in frequency and the MfS philosophy is that in some cases it should be accepted that larger vehicles will cross into the opposing lane.

5.2.3 Footways are provided on both sides of the junction and a dropped crossing with tactile paving is also proposed.

5.2.4 Visibility Splays of 2.4m 'x' distance and 52m 'y' distance are provided at the proposed priority junction off Greenhill Road and shown in **Figure 7.** The visibility splays in accordance with the requirements in MfS based on the 85th percentile speed data for an average weekday from the ATC. The current speeds at the proposed priority junction are shown in **Table 5.1** below.

Direction	Average	85th Percentile
Northbound	30mph (48 kph)	34 mph (54 kph)
Southbound	30mph (48 kph)	34 mph (54 kph)

Table 5.1 Average and 85th Percentile Speeds

5.2.5 It should be noted that as part of the 'Effect20' scheme, Greenhill Road, which is in Area 4 of the scheme, is proposed to become a 20mph speed limit by 2015. It is therefore expected that the speed limit for the road would be reduced by the proposed scheme opening year, and so the visibility requirements would also be reduced. However, if this scheme is not implemented, the information provided above has indicated that sufficient visibility can be achieved based on the existing vehicular speeds.

5.2.6 A proposed emergency access is provided off Nursery Lane at the southern end of the site. Droppable bollards within the corridor will allow access for emergency vehicles whilst preventing general vehicular access.

5.2.7 A Stage 1 Road Safety Audit has been commissioned and will be submitted separately.

5.3 Internal Road Layout

5.3.1 Vehicle swept path analysis using a Fire Tender and a Large Refuse has also been carried out for the proposed site access and the internal highway layout. These swept paths are shown in **Appendix G.** Suitable turning facilities can be accommodated within the site to allow a refuse vehicle to turn around within the site and exit in forward gear.

5.3.2 Elements of shared surface would be provided within the site, with the road level raised to kerb height in order to facilitate pedestrian movements across the site.

5.3.3 The internal access roads would be a minimum of 5m wide, which is sufficient to allow two cars to pass each other and accommodate service vehicles. The dimensions accord with best practice set out in MfS and MfS2.

5.4 Proposed Parking Arrangements

5.4.1 The 'Ensuring a Choice of Travel' SPD outlines the required parking standards for developments. The parking standards are provided to ensure that in general the parking requirements are kept to a minimum. With regards to Class C3 (dwelling houses) developments outside the city centre, the operational standards are minimum and are as shown in **Table 5.1**, the estimated parking requirements for the proposed development are shown in **Table 5.2**.

Land Use Class	Land Use	Minimum Standard
C3	Dwelling Houses	Outside the City Centre. Houses – Average of 1.5 spaces per dwelling

Table 5.1 Ensuring a Choice of Travel SPD Parking Standards

Number of Dwellings	Minimum Standard	Estimated Required Spaces
83	1.5 spaces per dwelling	125

Table 5.2 Estimated Parking Requirements

5.4.2 In accordance with the parking standards outlined above, the proposed scheme will provide 162 spaces across the site, contained in a mixture of driveway and garage spaces.

6 TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

6.1 Introduction

6.1.1 This chapter of the report considers the traffic impact of the proposed residential development on the local highway network.

6.2 Considered Scope of Junctions

6.2.1 As set out in the Scoping Note, the impact of the development traffic has been considered at 2 key junctions in the vicinity of the proposed development site. The junctions that have been considered are;

1) Southern Roundabout - Greenhill Road / Long Lane / Brodie Avenue/ Whitehedge Road.
2) Northern Roundabout - Greenhill Road / Stamfordham Drive / Heath Road /Kingswood Court.

6.3 Baseline Traffic Flows

6.3.1 Peak hour traffic periods have been identified from the surveyed traffic data. The AM peak hour in the vicinity of the site is 08:30-09:30 and the PM peak hour is 16:45-17:45. The 2014 Base traffic flow data is illustrated in **Figure 9.**

6.3.2 The 2014 flows have been factored using TEMPRO locally adjusted figures to 2016 and 2019 respectively to cover the likely year of opening and a 5 year horizon post planning application. This is discussed further in Chapter 7.

6.4 Trip Generation

6.4.1 Estimated trip generation for the site has been calculated using industry standard database software TRICS 2014(a) v7.1. Search criteria have been refined to reflect the conditions specific to the site. This includes the following;

- Residential – Mixed Private Housing;
- Actual range – 22 to 162 (units);
- Suburban Area;
- Exclude London / RoI / Northern Ireland; and
- Weekdays only.

6.4.2 The TRICS output report is included in **Appendix H.** The AM and PM peak hour trip rates are shown in **Table 6.1** and the calculated vehicular trips are shown in **Table 6.2** below.

Land Use Type	Trip Rates					
	AM 0800-0900			PM 1700-1800		
	Arrivals	Departures	2-way	Arrivals	Departures	2-Way
Residential (per unit)	0.091	0.368	0.459	0.287	0.127	0.414

Table 6.1 Trip Rate per Unit

Land Use Type	Trip rates based on 83 units					
	AM 0800-0900			PM 1700-1800		
	Arrivals	Departures	2-way	Arrivals	Departures	2-Way
Residential (per unit)	8	31	39	24	11	35

Table 6.2 Calculated Vehicular Trips

6.4.3 The trip rates utilised are consistent with the rates agreed within the scoping note and provide a robust assessment, with the 08:00-09:00 time period presenting higher trip rates than 09:00-10:00.

6.4.4 The proposed development is forecast to generate 31 and 35 two-way trips in the AM and PM peaks respectively. This equates to just over one vehicle every 2 minutes.

6.5 Trip Distribution

6.5.1 The proposed development effectively constitutes an extension to an existing residential area, and the patterns of vehicle movements from the proposed development are likely to be similar to those already on the local highway network. Therefore, it is proposed to distribute the residential development trips onto the local highway network based on the turning proportions observed from the traffic surveys carried out on Thursday 26th June 2014 at the northern and southern roundabouts.

6.5.2 In addition, as the proposed priority junction off Greenhill Road is the primary access point for the 83 dwellings, the existing flows (based on the turning count information from the adjacent roundabout junctions) on Greenhill Road have been used to determine proposed development trip movements in and out of the site. **Table 6.3** below sets out the assignment of development traffic flows based on the assumptions above.

Access	Direction	AM Peak		PM Peak	
		Arrivals	Departures	Arrivals	Departures
Greenhill Road	To/From North	4	14	12	5
	To/From South	3	17	11	5

Table 6.3 Development Trip Assignment

6.5.3 The overall development trip distribution and assignment across the local highway network are illustrated in **Figures 10-16.**

7 TRAFFIC IMPACT ASSESSMENT

7.1 Introduction

7.1.1 This chapter of the report considers the traffic impact of the proposed residential development on the local highway network. An opening year phase is considered to be 2 years from the planning application submission date to allow for site clearance and construction (i.e. 2016). A horizon year has been assessed for 5 years after planning application submission (i.e. 2019). This provides a robust assessment of likely future impacts of the development against the background traffic growth. Assessment beyond the 5 year horizon becomes increasingly unreliable as economic conditions are more difficult to robustly forecast.

7.2 Considered Scope of Junctions

7.2.1 As set out in the Scoping Note in **Appendix A**, the impact of the development traffic has been considered at 2 key junctions in the vicinity of the proposed development site. The junctions that have been considered are:

1) Southern Roundabout - Greenhill Road / Long Lane / Brodie Avenue/ Whitehedge Road.
2) Northern Roundabout - Greenhill Road / Stamfordham Drive / Heath Road / Kingswood Court.

7.2.2 We have also modelled the performance of the proposed new priority junction providing the access to the site from Greenhill Road.

7.3 Future Traffic Flow Scenarios

7.3.1 As detailed in the Scoping Note, the background traffic growth has been predicted using TEMPRO V6.2 with adjusted local factors specific to Liverpool. The factors were calculated separately using the TEMPRO Weekday AM and PM Peak time period selections with Origin / Destination trip ends. The factors are shown in **Table 7.1** below.

Years	TEMPRO Factor (adj to Liverpool)	
	AM Peak	PM Peak
2014-2016	1.0218	1.0212
2014-2019	1.0663	1.0652

Table 7.1 TEMPRO Adjusted Growth Rates

7.3.2 The future year scenario traffic flows are set out in the following Figures;

- **Figure 9** - 2014 Base Traffic Flows
- **Figure 10** - 2016 Base Traffic Flows
- **Figure 11** – 2019 Base Traffic Flows

- **Figure 12** – Development Trips Distribution IN
- **Figure 13** – Development Trips Distribution OUT
- **Figure 14** – Development Trips 2016
- **Figure 15** - 2016 Base plus Development Traffic Flows
- **Figure 16** - 2019 Base plus Development Traffic Flows

7.4 Junction Assessments

7.4.1 This section presents the assessments undertaken to determine the impact of the proposed development on the local highway network in both 2016 (opening year) and 2019 (horizon year).

7.4.2 The capacity assessments were carried out using ARCADY modelling software for the roundabout junctions and PICADY modelling software for the proposed development priority junction access off Greenhill Road.

7.4.3 The results of the capacity assessments are expressed in terms of Ration of Flow to Capacity (RFC) and Mean Max Queue (MMQ) length. Queue lengths are expressed in terms of Passenger Car Units (PCUs).

Site Access Junction

7.4.4 The PICADY results for the proposed site access junction are summarised in **Table 7.2** below. The full PICADY output can be seen in **Appendix I**.

Site Access Junction	AM		PM	
Movement	**RFC**	**Max Queue (PCU)**	**RFC**	**Max Queue (PCU)**
2016 Base + Development				
Site Access to Greenhill Road North and South	0.07	0	0.02	0
Greenhill Road (S) to Site Access	0.01	0	0.03	0
2019 Base + Development				
Site Access to Greenhill Road North and South	0.07	0	0.02	0
Greenhill Road (S) to Site Access	0.01	0	0.03	0

Table 7.2 PICADY Results for Proposed Site Access

7.4.5 The above results clearly show that the proposed site access will operate well within its practical capacity in the horizon assessment year of 2019, with minimal queuing and delay.

Northern Roundabout

7.4.6 The results for the Base and Base plus Development scenarios in 2016 and 2019 are summarised in **Tables 7.3** and **7.4** respectively. The full ARCADY output can be seen in **Appendix I**.

Northern Roundabout		AM		PM	
Arm		RFC	Max Queue (PCU)	RFC	Max Queue (PCU)
Existing Layout - 2016 Base					
1	Heath Road	0.23	0	0.24	0
2	Stamfordham Drive	0.16	0	0.12	0
3	Greenhill Road (S)	0.49	1	0.51	1
4	Knightscourt	0.02	0	0.01	0
5	Greenhill Road (N)	0.18	0	0.14	0
Existing Layout - 2016 Base + Development					
1	Heath Road	0.23	0	0.25	0
2	Stamfordham Drive	0.16	0	0.12	0
3	Greenhill Road (S)	0.52	1	0.52	1
4	Knightscourt	0.02	0	0.01	0
5	Greenhill Road (N)	0.18	0	0.14	0

Table 7.3 ARCADY Results for Northern Roundabout - 2016

Northern Roundabout		AM		PM	
Arm		RFC	Max Queue (PCU)	RFC	Max Queue (PCU)
Existing Layout - 2019 Base					
1	Heath Road	0.24	0	0.25	0
2	Stamfordham Drive	0.17	0	0.13	0
3	Greenhill Road (S)	0.52	1	0.53	1
4	Knightscourt	0.02	0	0.01	0
5	Greenhill Road (N)	0.18	0	0.15	0
Existing Layout - 2019 Base + Development					
1	Heath Road	0.24	0	0.26	1
2	Stamfordham Drive	0.17	0	0.13	0
3	Greenhill Road (S)	0.54	1	0.54	1
4	Knightscourt	0.02	0	0.01	0
5	Greenhill Road (N)	0.19	0	0.15	0

Table 7.4 ARCADY Results for Northern Roundabout - 2019

7.4.7 The results of the assessment show that the development-related traffic would have a negligible impact on the operation of the junction. The junction is forecast to operate well within operational capacity in both the base and base plus development scenarios.

Southern Roundabout

7.4.8 The results for the base and base plus development scenarios in 2016 and 2019 are summarised in Tables 7.5 and 7.6 respectively. The full ARCADY output can be seen in **Appendix I.**

Southern Roundabout		AM		PM	
Arm		RFC	Max Queue (PCU)	RFC	Max Queue (PCU)
Existing Layout - 2016 Base					
1	Greenhill Road	0.43	1	0.4	1
2	Long Lane	0.17	0	0.28	0
3	Whitehedge Road	0.23	0	0.24	0
5	Brodie Avenue	0.36	1	0.36	1
Existing Layout - 2016 Base + Development					
1	Greenhill Road	0.46	1	0.41	1
2	Long Lane	0.17	0	0.28	0
3	Whitehedge Road	0.24	0	0.25	0
4	Brodie Avenue	0.36	1	0.37	1

Table 7.5 ARCADY Results for Southern Roundabout – 2016

Southern Roundabout		AM		PM	
Arm		RFC	Max Queue (PCU)	RFC	Max Queue (PCU)
Existing Layout - 2019 Base					
1	Greenhill Road	0.46	1	0.42	1
2	Long Lane	0.17	0	0.29	0
3	Whitehedge Road	0.25	0	0.25	0
5	Brodie Avenue	0.38	1	0.38	1
Existing Layout - 2019 Base + Development					
1	Greenhill Road	0.48	1	0.43	1
2	Long Lane	0.18	0	0.3	0
3	Whitehedge Road	0.25	0	0.26	0
4	Brodie Avenue	0.38	1	0.38	1

Table 7.6 ARCADY Results for Southern Roundabout – 2019

7.4.9 The results of the assessment show that the development-related traffic would have a negligible impact on the operation of the junction. The junction is forecast to operate well within operational capacity in both the base and base plus development scenarios.

Summary

7.4.10 The junction assessments undertaken have shown that the impact of the development-related traffic on the local highway network is predicted to be minimal, with all junctions forecast to operate well within operational capacity for all scenarios.

8 SUMMARY AND CONCLUSIONS

8.1.1 AECOM has been commissioned by Morris Homes (North) Ltd to produce a TA to form part of a full planning application for a residential development (consisting of 83 dwellings) on the former Greenhill Nursery site which is located off Greenhill Road, Allerton in the Cressington Ward of Liverpool City.

8.1.2 The proposed development has been shown to adhere to both local and national planning policy.

8.1.3 AECOM has reviewed the most recently available five year road safety records for Greenhill Road and the northern and southern roundabout junctions. The PIA records show a total of 8 slight accidents within the study area and it is therefore considered that road safety does not present a material concern in the context of the proposed development.

8.1.4 An assessment of the accessibility of the site demonstrates that the site has a good level of accessibility by non-car modes of transport. Pedestrian and cycle infrastructure in the area is good, and the site is located within walking distance of various local facilities, employment opportunities and schools. There are also bus stops and a well-connected railway station (Liverpool South Parkway) within easy walking distance of the site.

8.1.5 The site will be accessed via a new priority junction provided on Greenhill Road.

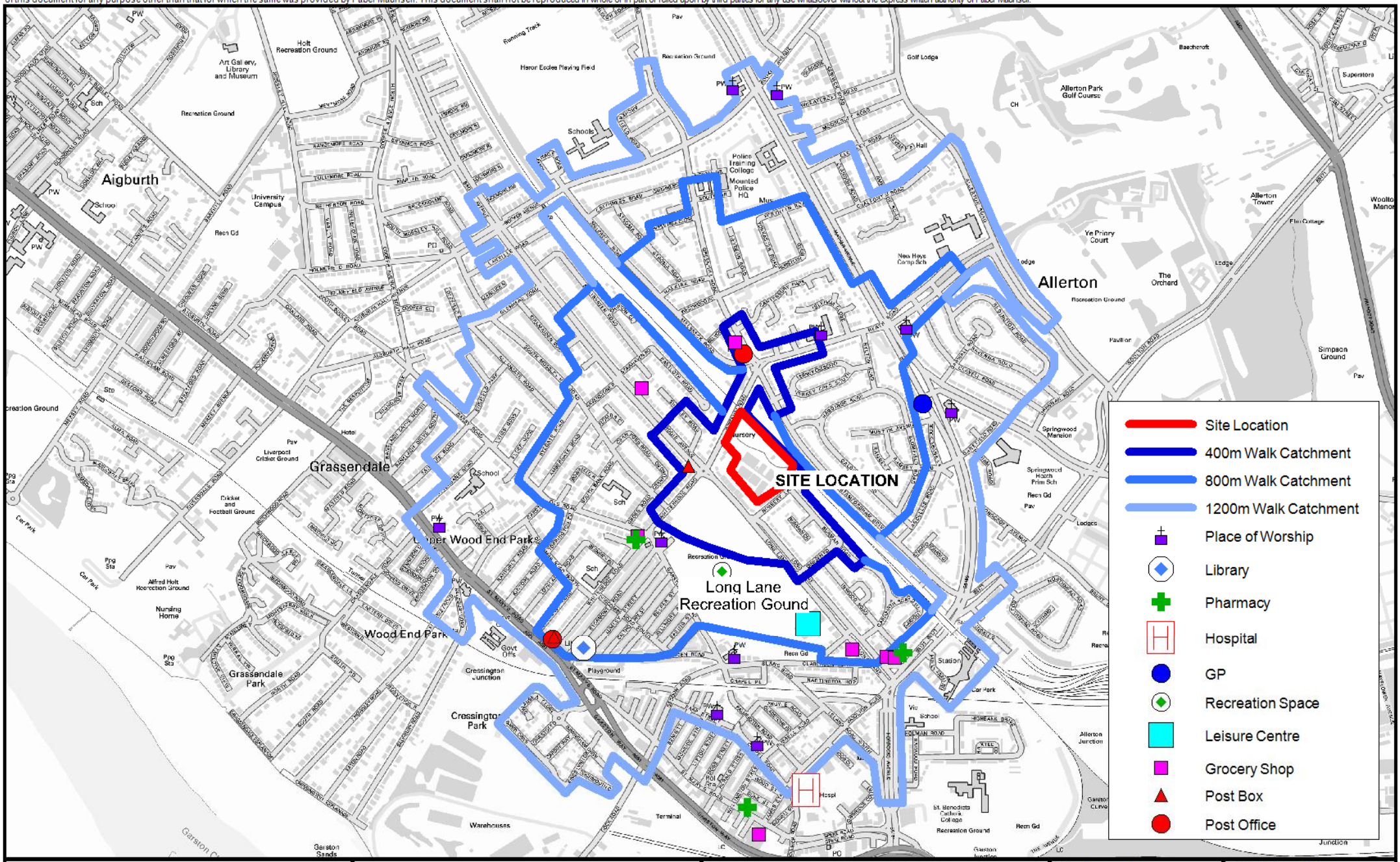
8.1.6 Suitable turning facilities can be accommodated within the site to allow a refuse vehicle to turn around within the site and exit in forward gear.

8.1.7 An emergency access would be provided to connect with Nursery Lane. Droppable bollards within the corridor will allow access for emergency vehicles and prevent general vehicular access.

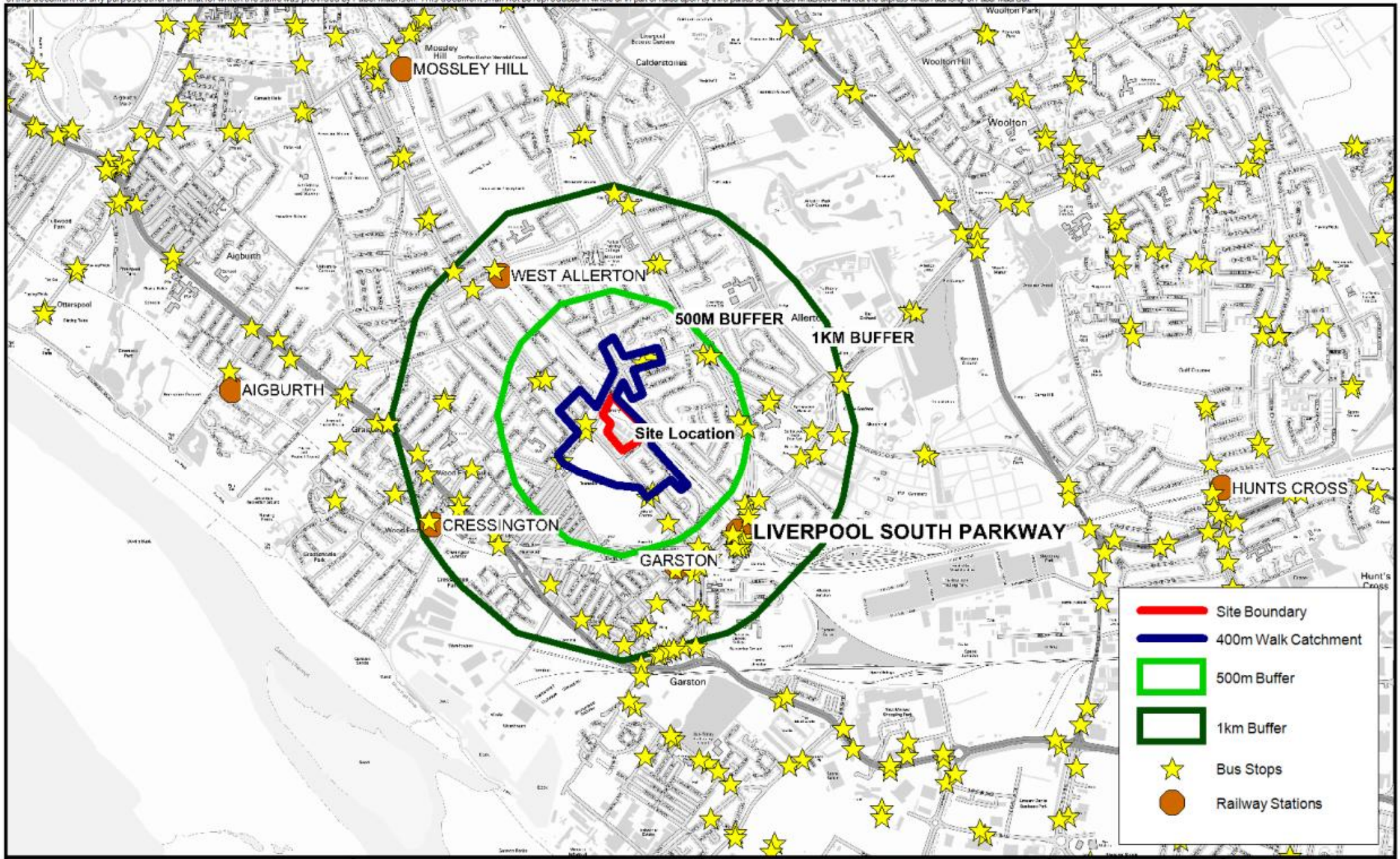
8.1.8 A TRICS-based trip generation assessment has been carried out which demonstrates that the scheme is forecast to generate 31 and 35 two-way vehicle movements during the AM and PM peaks respectively. Volumetrically, this equates to just over 1 vehicle movement every 2 minutes, on average, during each of these peak hours. The impact of this on the operation of the northern and southern roundabout junctions has been shown to be minimal, with the junctions forecast to operate well within operational capacity.

8.1.9 For the reasons set out above, it is considered that there is no reason on highway or transport grounds why the development proposals should not be granted planning permission.

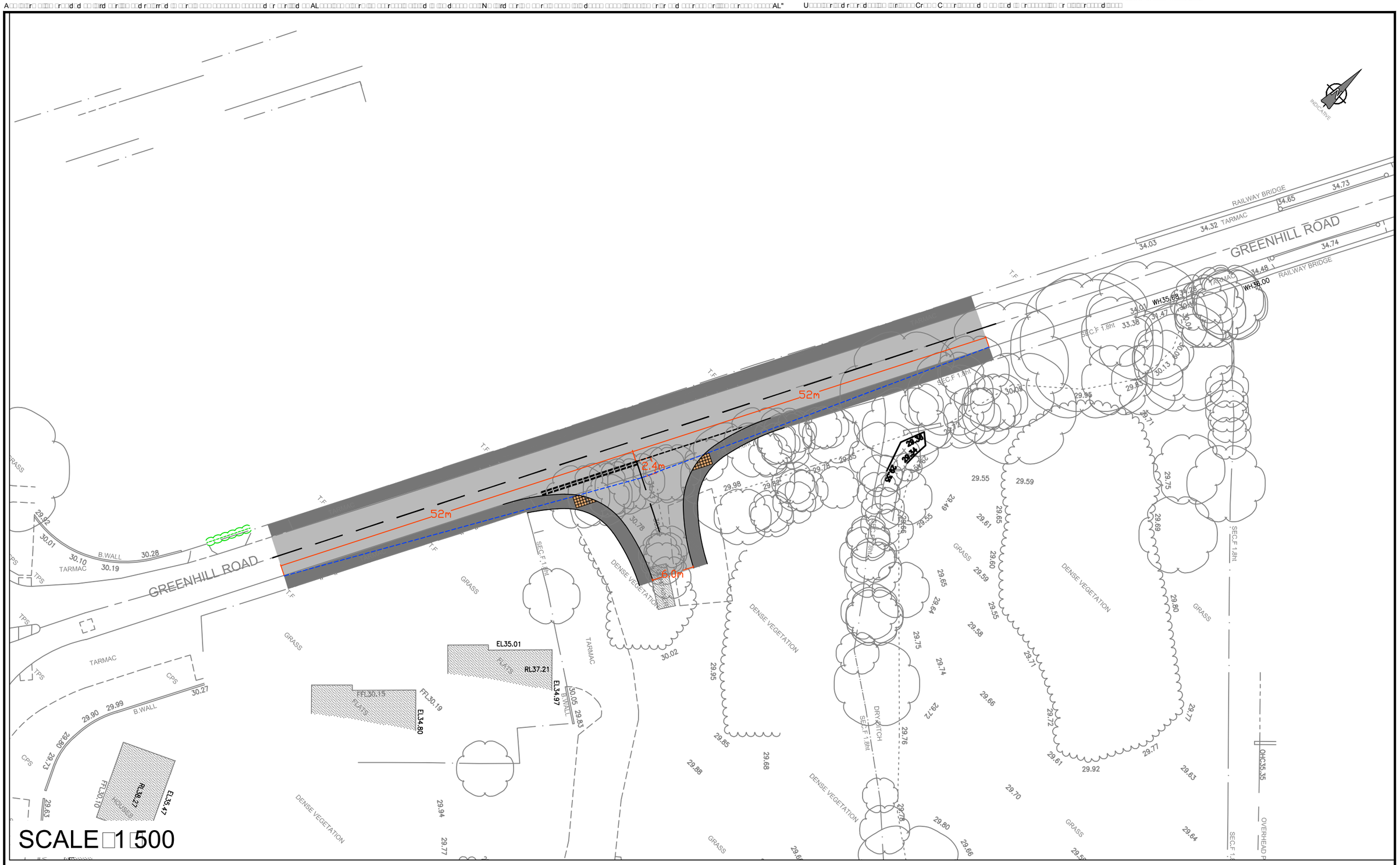
FIGURES



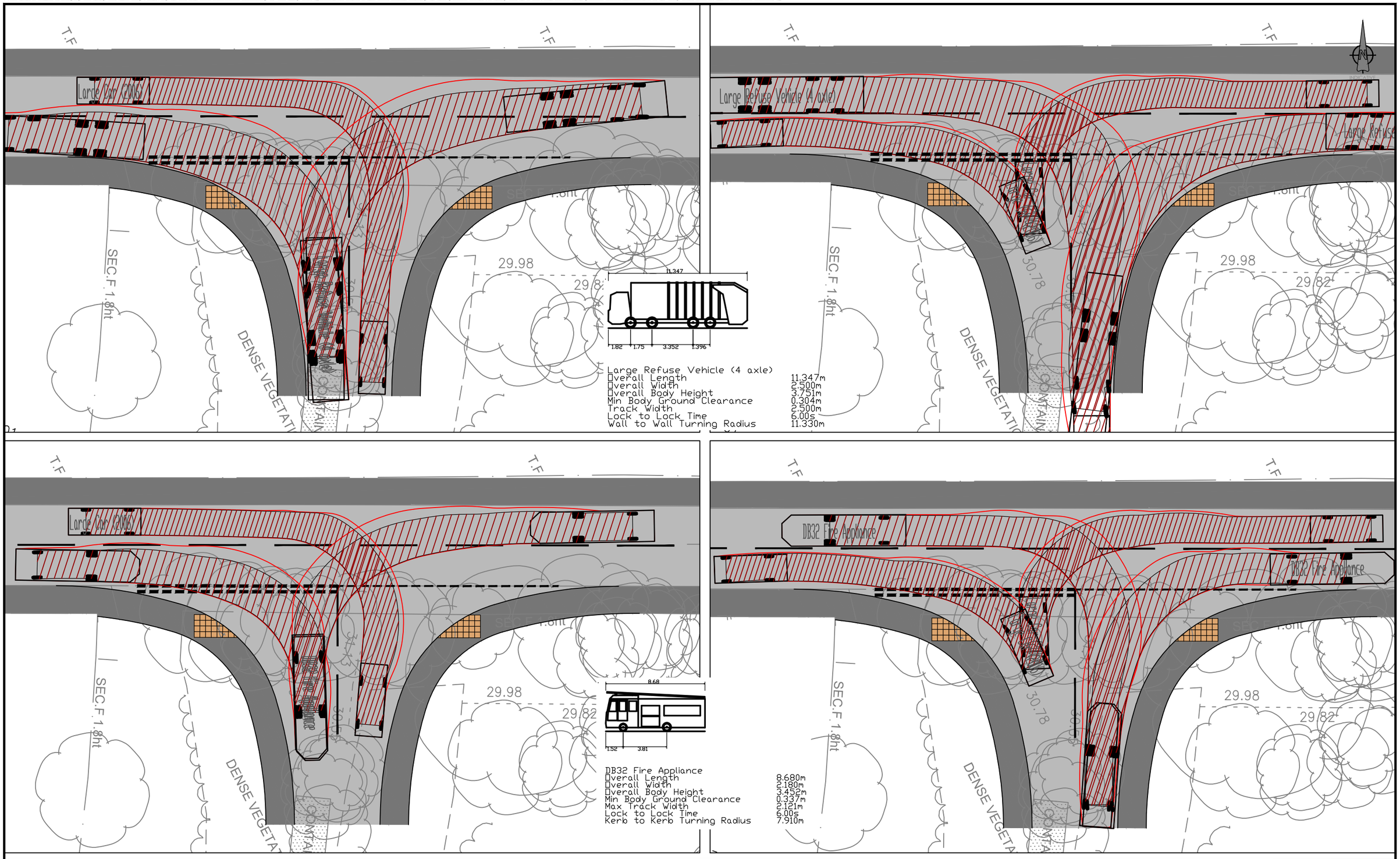
Client: Morris Homes (North) Ltd	Title: Local Amenities Plan FIGURE 3	AECOM Exchange Court, 1 Dale Street, Liverpool L2 2ET T +44 (0)151 331 8900 F +44 (0)151 331 8999 www.aecom.com	Design: PG Mapinfo: PG
Project: Former Greenhill Nursery			Chk'd: AL App'd: AL
			Date: 17.06.14 Scale: N.T.S
			No: 60323405 -M- 002



Client: Morris Homes (North) Ltd	Title: Public Transport Links FIGURE 5	AECOM Exchange Court, 1 Dale Street, Liverpool L2 2ET T +44 (0)151 331 8900 F +44 (0)151 331 8999 www.aecom.com	Design: PG / Mapinfo: PG
Project: Former Greenhill Nursery			Chk'd: AL / App'd: AL
			Date: 17.06.14 / Scale: N.T.S
			No: 60323405 -M- 001



C□□□□□ MORRIS HOMES	T□□□□ PROPOSED SITE ACCESS ARRANGEMENT FIGURE 7	AECOM	D□□□□□□ PG / CAD□ PG
Pr□□□□□□ FORMER GREENHILL NURSERY -		E□□□□□□□□ C□□r□□ 1 D□□□ S□r□□□□ L□□□r□□□□□ L2 2ET T□□□□44 □0□151 331 8900 F□□□□44 □0□151 331 8999	C□□d□ AL / A□□d□ ME
			D□□□□ 30□06□14 / S□□□□□AS SHOWN
			N□□60323405 □DWG □001 / R□□□
			A3



C□□□□□

MORRIS HOMES

Pr□□□□□□

FORMER GREENHILL NURSERY
-

T□□□□

PROPOSED SITE ACCESS
SWEPT PATH ANALYSIS
FIGURE 8

E□□□□□□□□ C□□r□□
1 D□□ S□r□□□□
L□□□r□□□□□
L2 2ET

AECOM

T□□□□44 □0□151 331 8900
F□□□□44 □0□151 331 8999
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D□□□□□□ PG	CAD□ PG
C□□d□ AL	A□□d□ ME
D□□□□ 30□06□14	S□□□□□1□200
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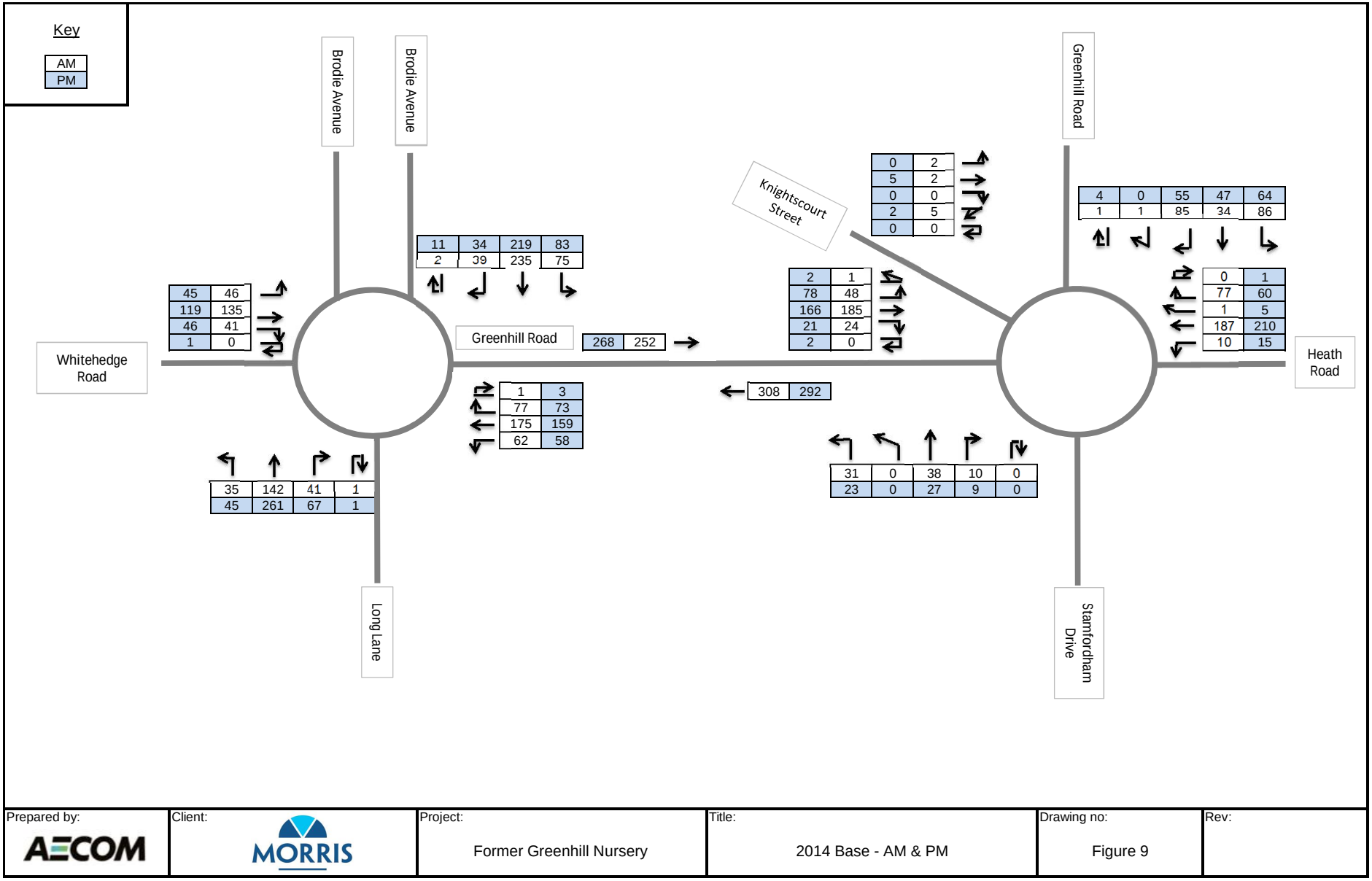
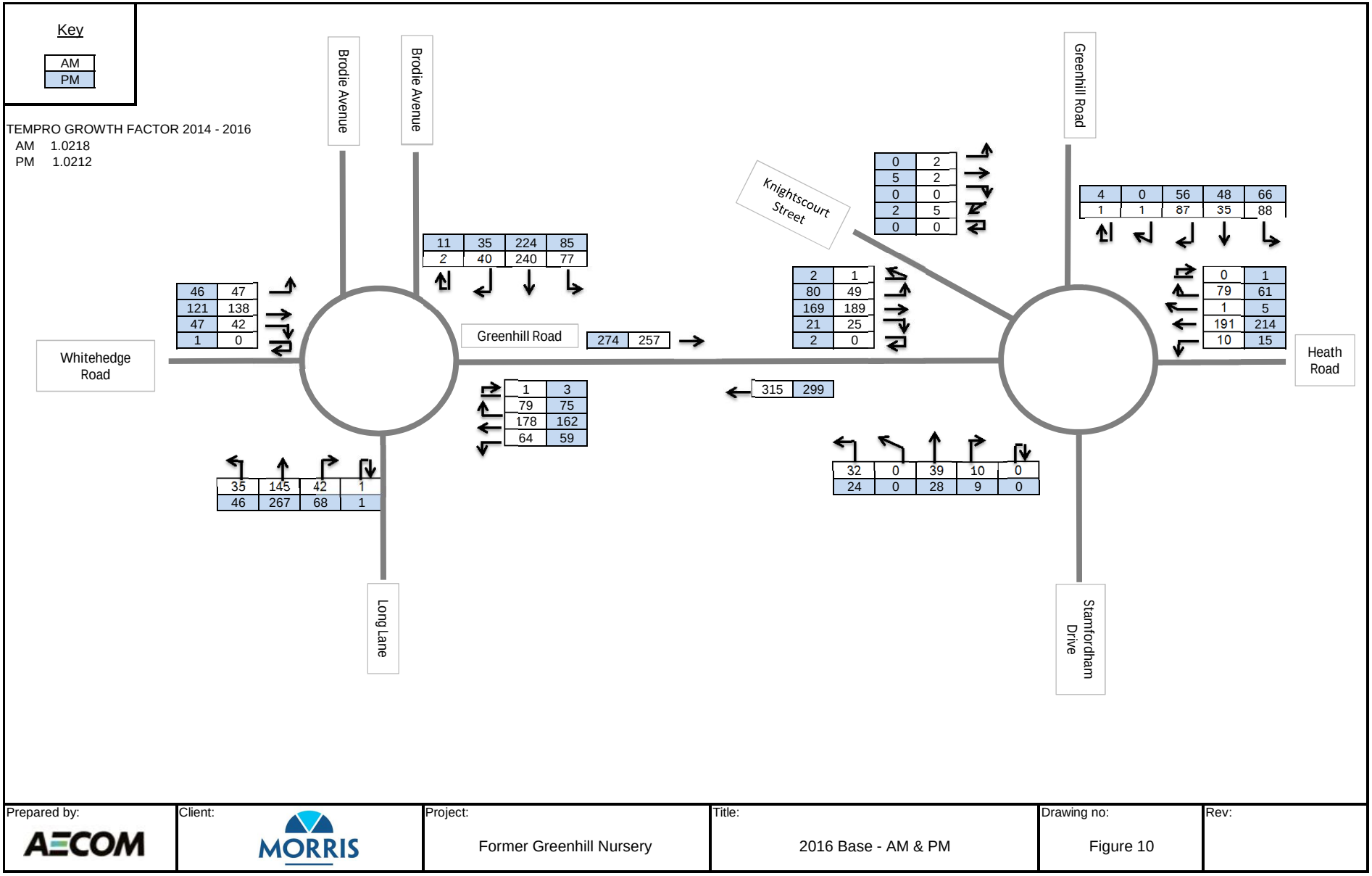
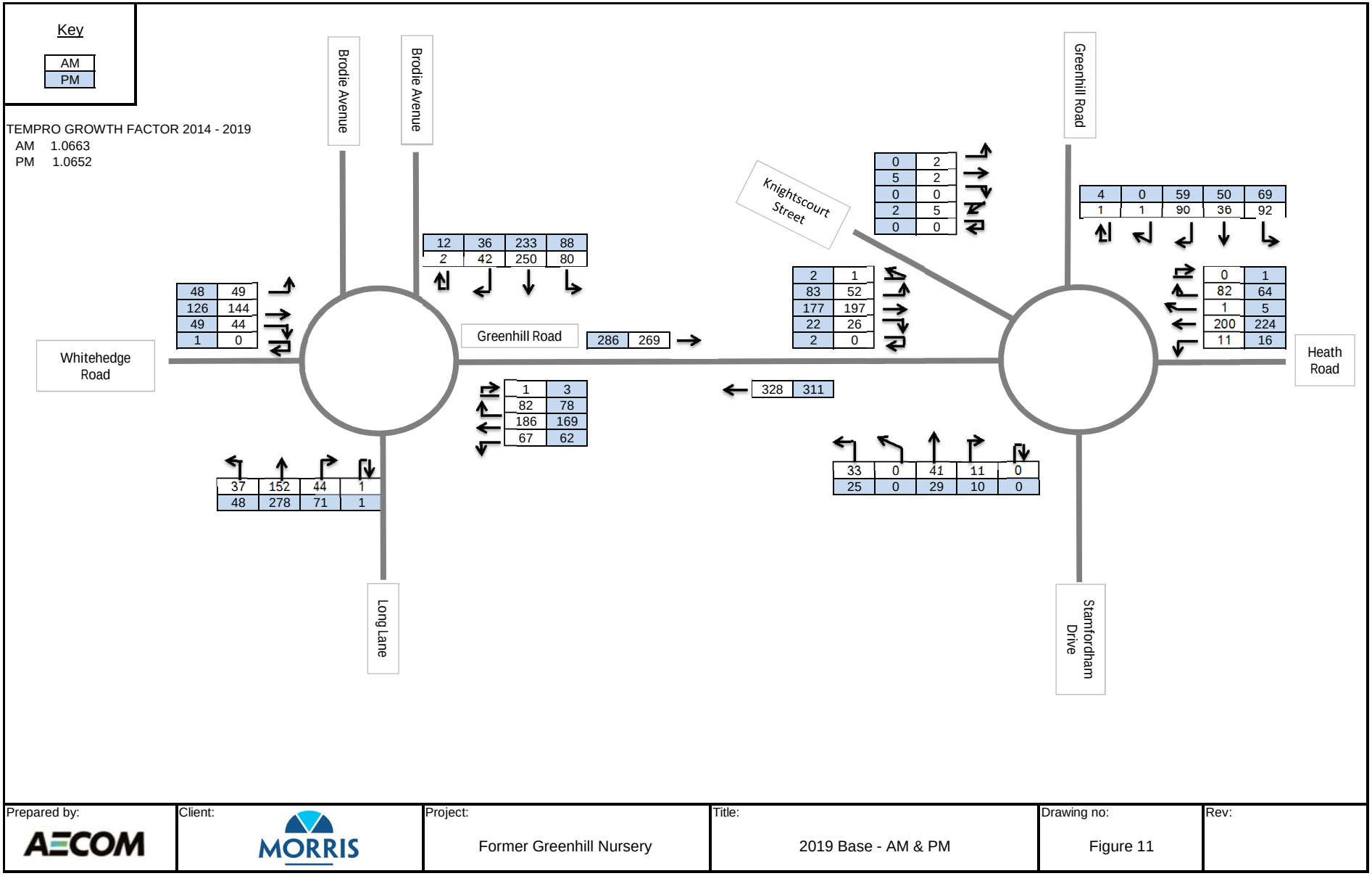
A3



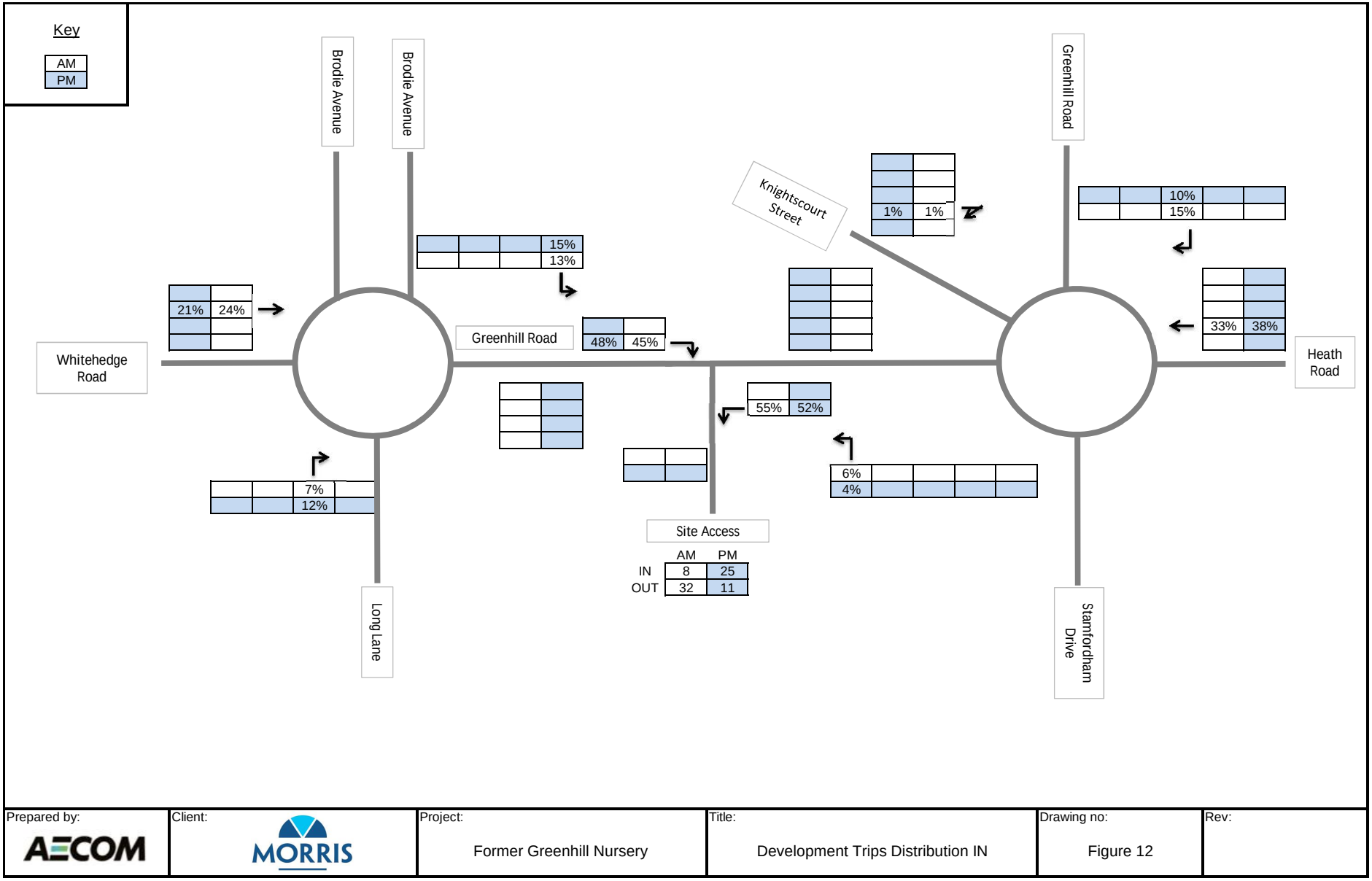
Prepared by:	Client:	Project:	Title:	Drawing no:	Rev:
AECOM	MORRIS	Former Greenhill Nursery	2014 Base - AM & PM	Figure 9	



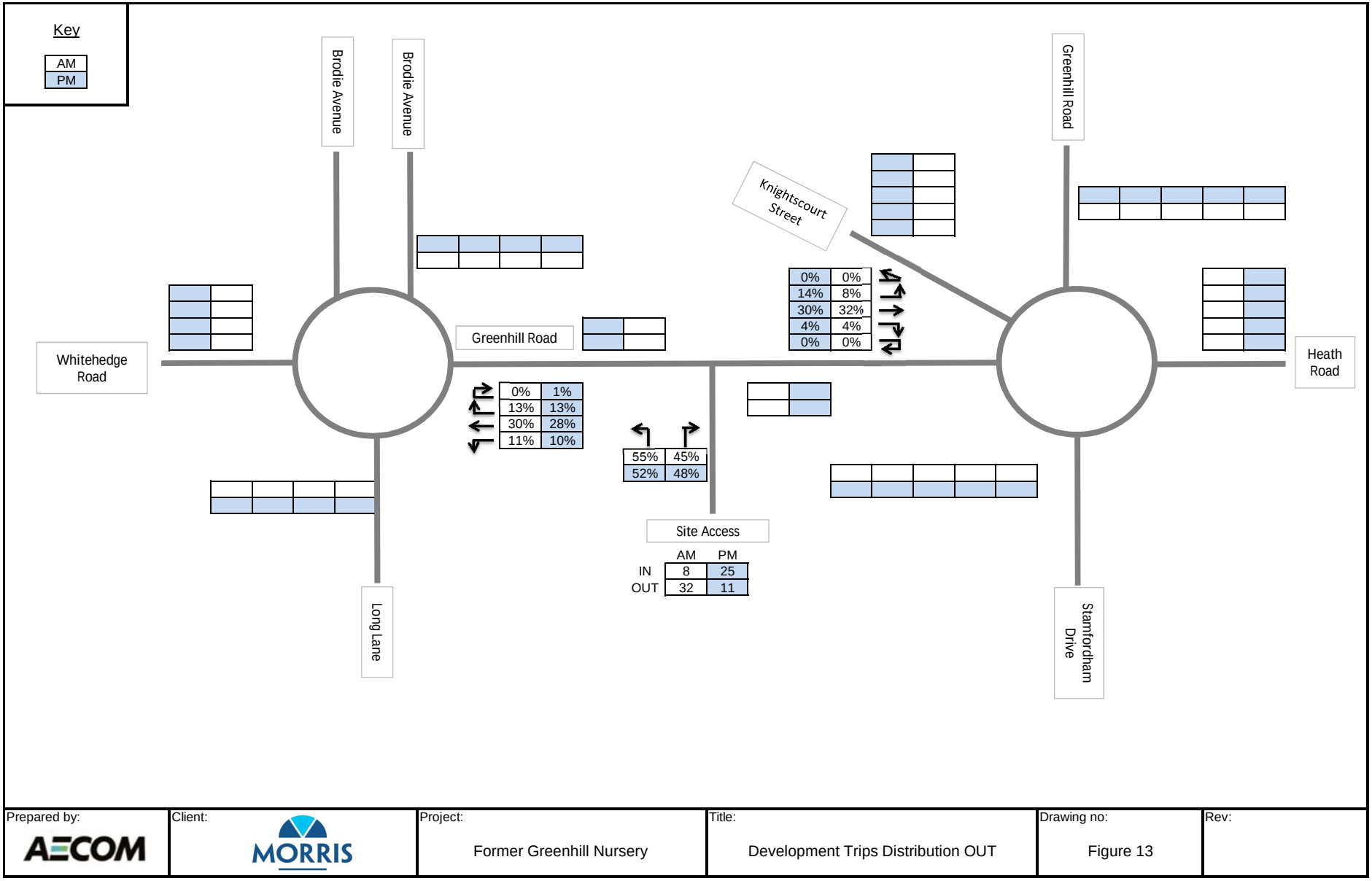
Prepared by:	Client:	Project:	Title:	Drawing no:	Rev:
AECOM	MORRIS	Former Greenhill Nursery	2016 Base - AM & PM	Figure 10	



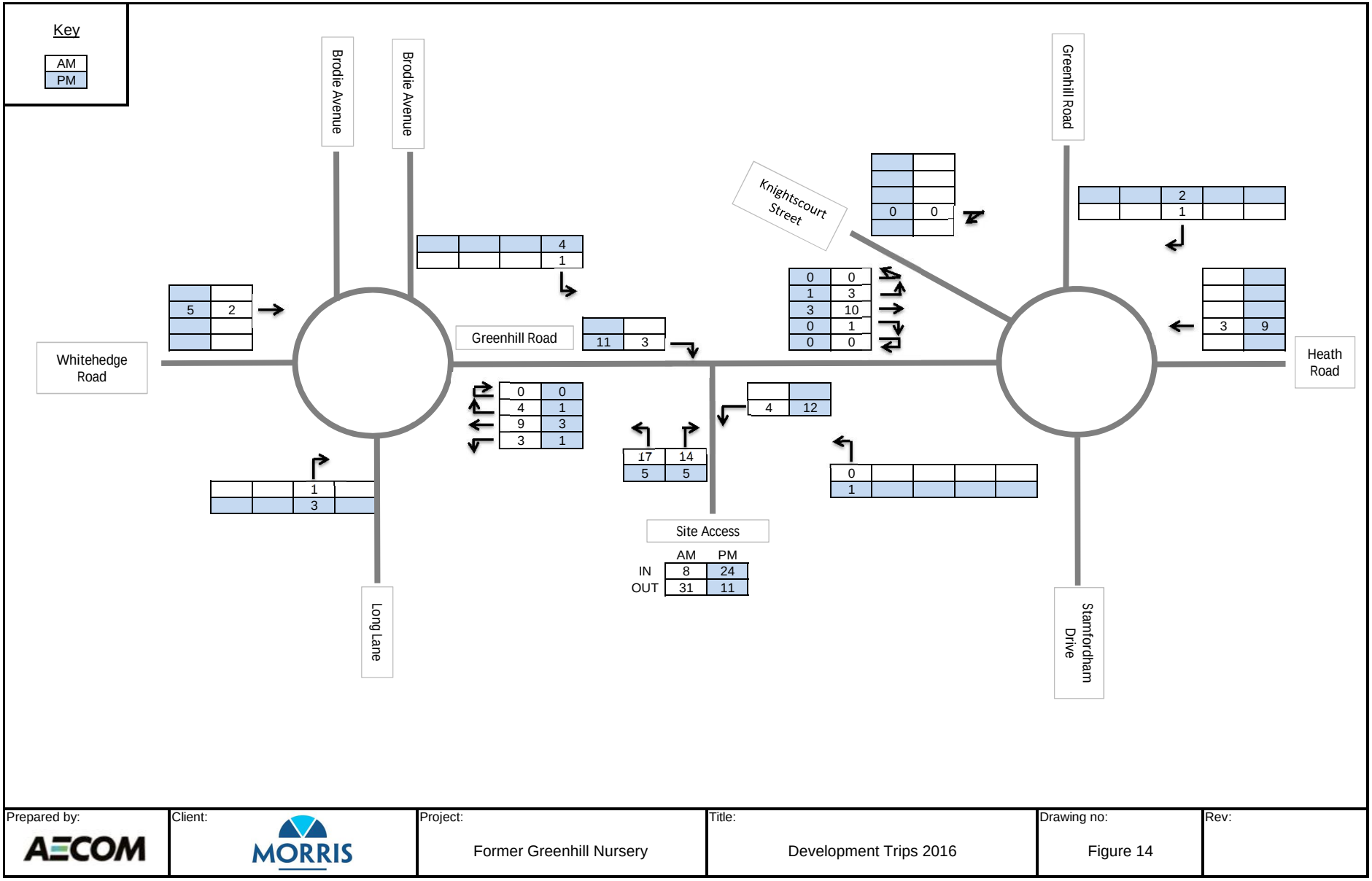
Prepared by:	Client:	Project:	Title:	Drawing no:	Rev:
AECOM	MORRIS	Former Greenhill Nursery	2019 Base - AM & PM	Figure 11	



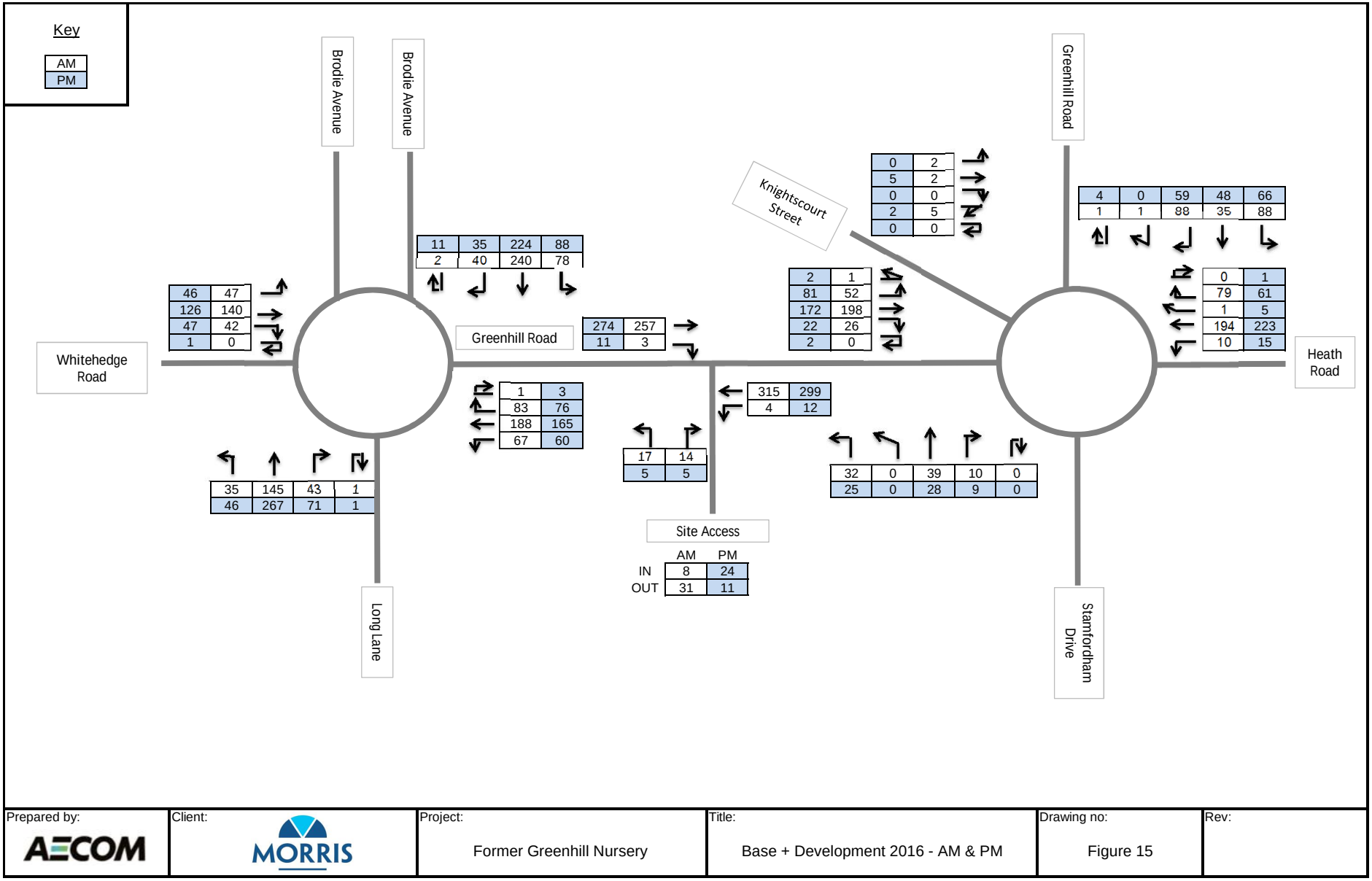
Prepared by:	Client:	Project:	Title:	Drawing no:	Rev:
AECOM	MORRIS	Former Greenhill Nursery	Development Trips Distribution IN	Figure 12	



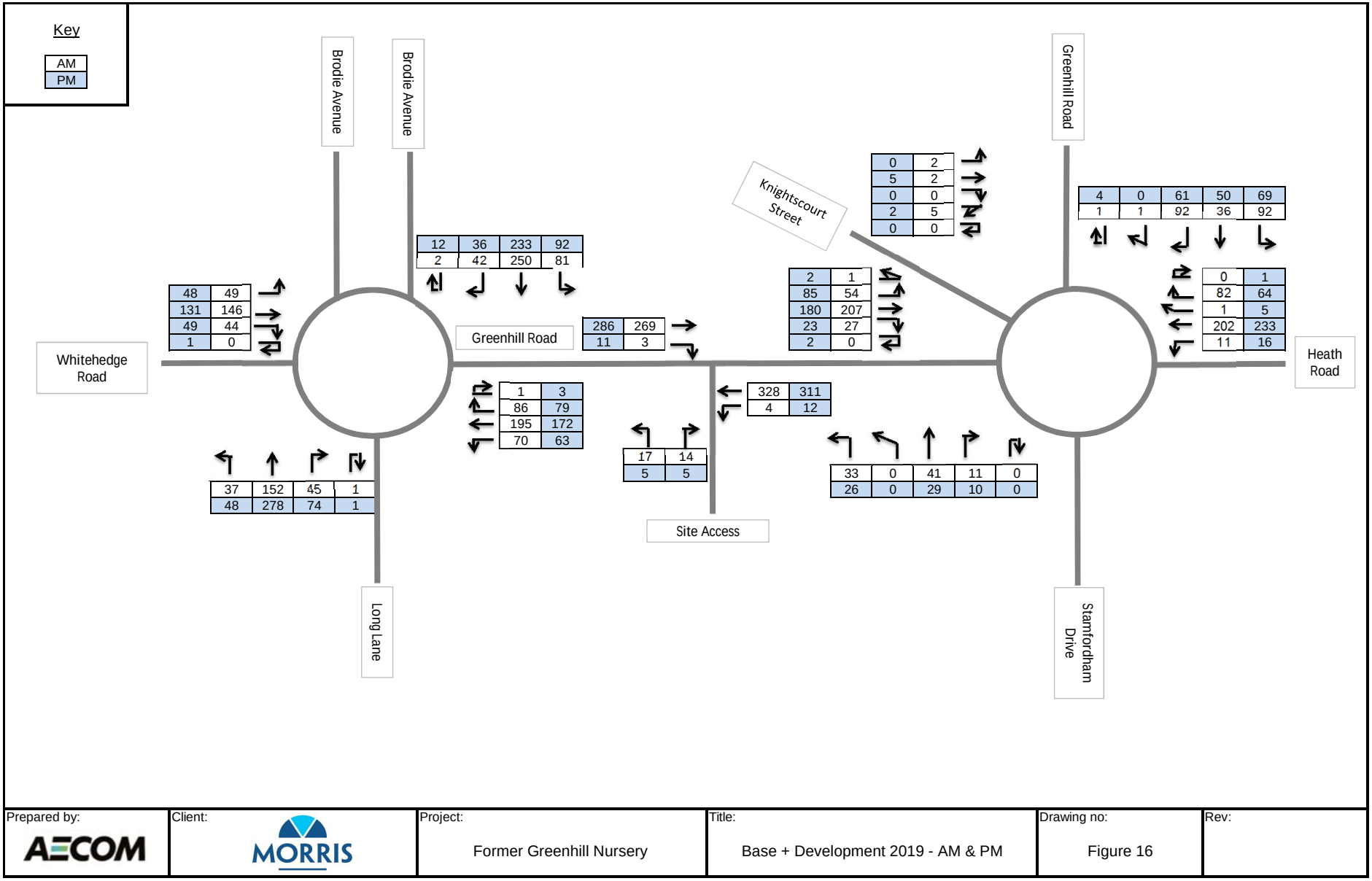
Prepared by:	Client:	Project:	Title:	Drawing no:	Rev:
AECOM	MORRIS	Former Greenhill Nursery	Development Trips Distribution OUT	Figure 13	



Prepared by:	Client:	Project:	Title:	Drawing no:	Rev:
AECOM	MORRIS	Former Greenhill Nursery	Development Trips 2016	Figure 14	



Prepared by:	Client:	Project:	Title:	Drawing no:	Rev:
AECOM	MORRIS	Former Greenhill Nursery	Base + Development 2016 - AM & PM	Figure 15	



Prepared by:	Client:	Project:	Title:	Drawing no:	Rev:
AECOM	MORRIS	Former Greenhill Nursery	Base + Development 2019 - AM & PM	Figure 16	

APPENDIX A – SCOPING NOTE

Aylmer-Brewin, Caroline

From:	Walker, Stephen <Stephen.Walker@liverpool.gov.uk>
Sent:	20 June 2014 10:57
To:	Gibbon, Phil
Cc:	Wong, Anna
Subject:	RE: FORMER GREENHILL NURSERY SITE - LCC Enquiry Ref 0844/13 - Transport Assessment Scoping Note

Phil,

Thank you for your email.

The scoping note is satisfactory and sets out the required details for Highways Development Control to be able to assess the likely traffic impacts generated by the development proposals. The main concern to Highways would be traffic exiting on to Greenhill Road and the visibility to traffic approaching from the bridge over the railway and how this is dealt with. If the properties are to be privately owned it is unlikely that a travel plan is necessary as this would be difficult to enforce. It may be more appropriate to have a commitment form the developer to address this issue with information packs provided at the point of sale on Bus routes, cycle routes and Merseyrail connections at South Liverpool Parkway etc. rather than any formal travel plan commitment.

For accident data please contact;
Victoria.banks@liverpool.gov.uk

For Adopted Highway searches please contact;
Les.kevan@liverpool.gov.uk

Unfortunately we do not have any current traffic data for this location.

If you require further details please contact me.

Regards,

Stephen Walker I Principal Engineer Highways Development Control

Liverpool City Council I Municipal Buildings I Dale Street I Liverpool I L2 2DH

T: 0151 233 8123 I E: stephen.walker@liverpool.gov.uk

Online: www.liverpool.gov.uk

From: Gibbon, Phil [mailto:Phil.Gibbon@aecom.com]
Sent: 17 June 2014 09:35
To: Walker, Stephen
Cc: Leary, Adam; Toye, Kevin; Edwards, Mark
Subject: FORMER GREENHILL NURSERY SITE – LCC Enquiry Ref 0844/13 - Transport Assessment Scoping Note

Dear Stephen,

FORMER GREENHILL NURSERY SITE – LCC Enquiry Ref 0844/13

Further to receipt of a Pre-Application report dated 02.01.14, please find attached a Scoping Note for comment and agreement with regards to production of a Transport Assessment as part of a full planning application for a residential development at the former Greenhill Nursery Site, Greenhill Road, L19.

In order to progress with the TA, please can you also provide relevant contact details within LCC for us to obtain?;

1) accident data;
2) adopted highway plans; and
3) traffic survey data. (We would like to check if data is available soonest, bearing in mind the school summer holidays coming up and we may need to commission surveys if no data is available)

I look forward to receiving your comments and agreement on the scoping note.

In the meantime, if you require any further information or have any questions then please do not hesitate to contact me on the number below or alternatively we could arrange a meeting at a suitable time/location.

Yours faithfully,

Phil Gibbon BEng (Hons) MCIHT
Consultant Engineer,
Development, Transportation
D +44 (0)151 331 8930
Phil.Gibbon@aecom.com

AECOM
Exchange Court, 1 Dale Street, Liverpool L2 2ET
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F +44 (0)151 331 8999
www.aecom.com

Technical Note

Project:	**Former Greenhill Nursery, Greenhill Road**	Job No:	**60323405**
Subject:	**Transport Assessment Scoping Note**		
Prepared by:	**Phil Gibbon**	Date:	**16.06.14**
Checked by:	**Adam Leary**	Date:	**16.06.14**
Approved by:	**Mark Edwards**	Date:	**16.06.14**

Introduction

This scoping note has been prepared by AECOM on behalf of Morris Homes Ltd concerning land at Greenhill Nursery, Greenhill Road, Allerton, Liverpool. The proposal is to construct 86 dwelling including 3 bed mews and 3and 4 bed detached properties, with a new access point onto Greenhill Road.

A pre-application report prepared by Liverpool City Council dated 02.01.14, ref 0844/13 was provided to Morris Homes. This pre-application report contains advice without prejudice to any subsequent planning decision. The advice is based on information provided to the case officer and is as accurate as possible but is an officer's view of the proposal.

As the proposals are for in excess of 80 units and in line with *Guidance on Transport Assessment* (DfT, 2007), a full Transport Assessment is proposed for the site. The following scoping note discusses the key technical points for agreement with Liverpool City Council highways and transportation department.

Transport Policy

Key local and national guidance will be discussed accordingly including NPPF and the Liverpool City Council SPD. Particular reference will be given to *'Ensuring a Choice of Travel Supplementary Planning Document'*

Furthermore, the key themes of Manual for Streets will be explored accordingly. The wider emerging national guidance will also be outlined with due regard to the development proposals.

Existing Conditions

- The former operation of the site (nursery) and neighbouring land uses will be discussed;
- The existing local highway infrastructure will be identified;
- Any existing highway capacity constraints will be discussed;
- Current access arrangements will be identified;
- Public transport and walking/cycling infrastructure will be discussed
- Existing location amenities will be identified; and
- Accident data analysis will be undertaken.

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F +44 (0)151 331 8999
www.aecom.com

Exchange Court
1 Dale Street
Liverpool
L2 2ET
United Kingdom

Sustainable Access

In addition to the commentary presented in the existing conditions section, a comprehensive analysis will be undertaken with regard to sustainable access. This detail will also be a key component of the Framework Residential Travel Plan;

- Bus services, timetables and destinations served;
- Cycle Routes; and
- Pedestrian routes, connectivity, crossing locations and likely additional demands;

Proposed Development

The proposals will be detailed and further information will be provided as follows;

- Full description of the site including numbers and sizes of units proposed;
- A description of the internal highways layouts and its fit with Manual for Streets guidelines;
- Parking numbers per units to correspond to current Transport SPD standards (average of 1.5 spaces per dwelling with 4 bed houses requiring 2 parking spaces) ;

Design and Internal Layout

The indicative internal layout is illustrated in Sketch 'SK1A'

In-line with the pre-application advice on internal roads, a swept path analysis for a refuse vehicle will be undertaken. The design of traffic calming measures, shared surfaces, drainage and street lighting would be agreed as part of a section 38/278 agreement if the new internal roads are to be offered up for adoption.

Assessment into a secondary emergency vehicular access via Nursery Lane will be undertaken.

Site Access

Primary Access
Greenhill Road is a single carriageway with a speed limit of 30mph with footways on both sides. The access / egress proposal consists of a priority arrangement with Greenhill Road.

Visibility Splays of 2.4m by 43m are required in accordance with Manual for Streets guidance for a 30mph road. The splay will be validated with an 85th percentile speed survey. It should be noted that as part of the 'Effect20' scheme Greenhill Road which is in Area 4 of the scheme is proposed to become a 20mph speed limit by 2015.

Trip Generation and Distribution

The following **Table 1.1** illustrates the initial TRICS Database outputs which we propose using to determine the likely development traffic trip generation.

Land Use Type	Trip Rates					
	AM Peak			PM Peak		
	Arrivals	Departures	2-way	Arrivals	Departures	2-Way
Residential (per unit)	0.091	0.368	0.459	0.287	0.127	0.414

Table 1.1 Proposed Vehicular Trip Rates

The Residential trip rates have been determined through TRICS 2014 v7.1 using the following criteria:

- All resurveyed sites have been removed so as to only include the most recent survey;
- Sites in N.Ireland, Ireland and Greater London have not been included;
- Only weekday surveys have been used;
- Only Suburban Area /No Sub Category zones have been used; and

A comprehensive breakdown of how TRICS has been interrogated will be presented in the Transport Assessment.

Traffic distribution will be apportioned based on classified turning counts in the locality.

Traffic Count Data

Fully classified turning count data will be obtained for;

1) Greenhill Road / Long Lane / Brodie Avenue (Roundabout)
2) Greenhill Road / Stanfordham Drive / Heath Road (Roundabout)

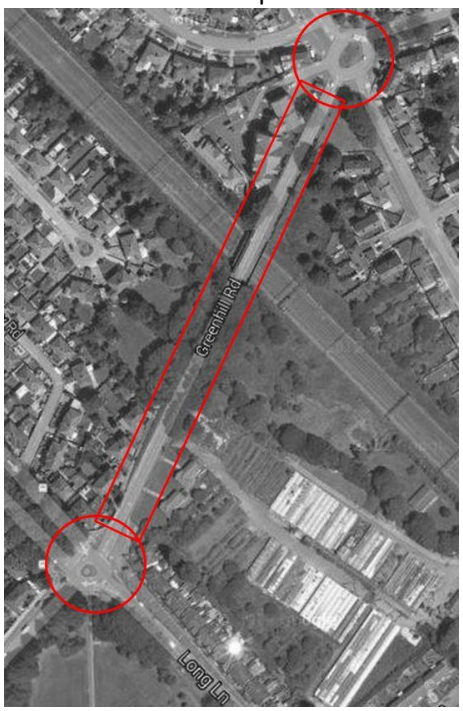
Traffic Impact Assessment

ARCADY modelling assessments for the above roundabouts at peak hours (derived from traffic count data) will be undertaken and a PICADY assessment for the proposed priority junction will also be undertaken. An opening year of 2016 will be assumed along with a horizon year of 2019 (5 years from application date).

Background traffic growth will be factored using TEMPRO adjusted figures for the local area. The table below shows the growth factors which will be used in the TA;

Years	TEMPRO Factor AM	TEMPRO Factor PM
2014-2016	1.0218	1.0212
2014-2019	1.0663	1.0652

Accident Data will be purchased and assessed for the area as shown below;



Minimum Accessibility Standard Assessment (MASA)

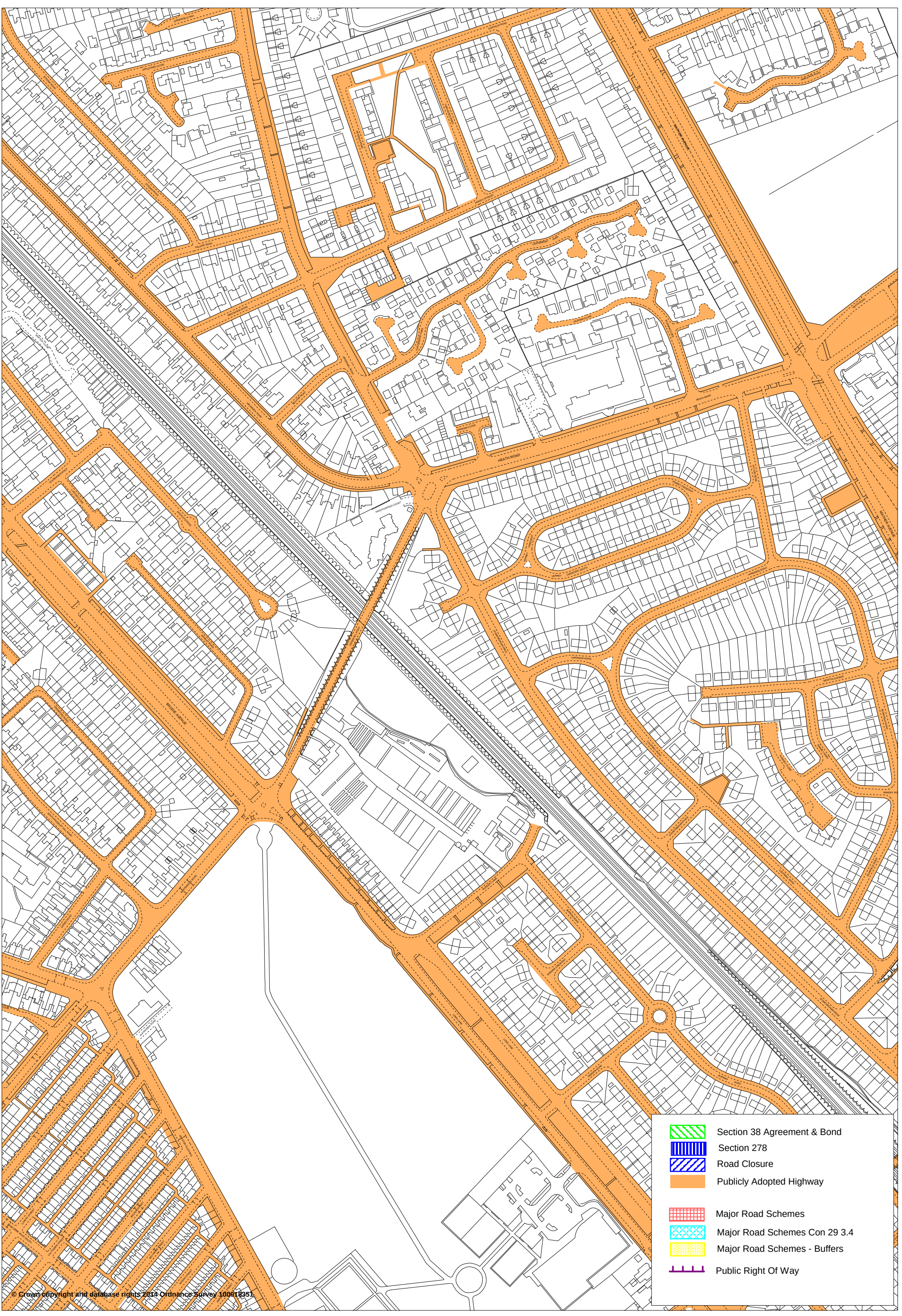
In line with the guidance contained within *'Ensuring a Choice of Travel Supplementary Planning Document'* a MASA will be completed and included with the TA

Framework Residential Travel Plan

In addition to the Transport Assessment, a separate Framework Residential Travel Plan will be prepared. This document will present suitable measures and targets to ensure that alternatives to car based trips are explored. Key aspects will include:

- Location and development proposals;
- Travel plan background and policy;
- Existing sustainable transport provision;
- Aims, objectives and targets;
- Proposed travel plan measures;
    - SMART based measures and toolkit, travel plan co-ordination;
    - Walking and cycling measures;
    - Personalised journey planning;
    - Resident Travel Information Packs; and
    - Physical improvements.
- Monitoring and review.

APPENDIX B – HIGHWAY BOUNDARY



APPENDIX C – PERSONAL INJURY ACCIDENT DATA

Date: 01-July-2014
Time: 16:35:18

Title: **Greenhill Road and Junctions 2009-2013**

Requested output: **P - Print Crash Report**
Date: 01-July-2014

There were 8 reported crashes resulting in injury

P-PRINT CRASH REPORT

Greenhill Road and Junctions 2009-2013

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Special Conditions	Factors	Involved
1	**Road No U Grid 340154E Section Ref 385493N**	SLIGHT	09/02/2012	Thu	20:45	L	Wet/Damp	Fine	NONE		
	U Greenhill Road At Junction With U Brodie Avenue, Liverpool, Merseyside, L19221/L19083								Liverpool		
								Veh1 NW -> SE Veh2 SW -> N			Casualties 1 Vehicles2
2	**Road No U Grid 340141E Section Ref 385480N**	SLIGHT	04/03/2012	Sun	16:25	L	Dry	Fine	NONE		P/C
	U Long Lane At Junction With U Brodie Avenue, Liverpool, Merseyside, L19301/L19083								Liverpool		
								Veh1 SW -> NE Veh2 E -> W			Casualties 1 Vehicles2
3	**Road No U Grid 340154E Section Ref 385493N**	SLIGHT	11/03/2011	Fri	11:20	L	Dry	Fine	NONE	R.TURN	
	U Greenhill Road at Junction with U Brodie Avenue, Liverpool, L19221/L19083								Liverpool		
								Veh1 NW -> SE Veh2 SE -> NE			Casualties 1 Vehicles2
4	**Road No U Grid 340154E Section Ref 385493N**	SLIGHT	02/03/2012	Fri	07:30	L	Dry	Fine	NONE		P/C
	U Brodie Avenue At Junction With U Long Lane, Liverpool, Merseyside, L19083/L19301								Liverpool		
								Veh1 S -> N Veh2 E -> N			Casualties 1 Vehicles2

Key

Involved
- *PED* Pedestrian
- *HGV* Heavy Goods Vehicle
- *GV* Goods Vehicle
- *M/C* Motor Cycle
- *P/C* Pedal Cycle
- *PSV* Bus/Coach

Street Lighting
- *L* Daylight
- *STL* Street Lights
- *USL* Street Lights Unlit
- *NSL* No Street Lights
- *STU* Street Lights Unknown

FACTORS
- *R.TURN* Right Turn Manoeuvre
- *O/TAKE* Overtaking Manoeuvre
- *S.VEH* Single Vehicle

Special Conditions
- *ATS OUT* Traffic Lights Not Working
- *ATS DEF* Traffic Lights Defective
- *SIGNS* Road Signs Defective or Obscurred
- *RD WRKS* Road Works
- *Surface* Road Surface Defective

P-PRINT CRASH REPORT

Greenhill Road and Junctions 2009-2013

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Special Conditions	Factors	Involved
5	**Road No U Grid 340304E Section Ref 385779N**	SLIGHT	15/04/2012	Sun	06:40	L	Dry	Fine	NONE		
	U Heath Road At Junction With U Greenhill Road, Liverpool, Merseyside, L19245/L19221								Liverpool		
								Veh1 S -> N Veh2 E -> W			Casualties 1 Vehicles2
6	**Road No U Grid 340154E Section Ref 385493N**	SLIGHT	26/04/2011	Tue	09:40	L	Dry	Fine	NONE		P/C
	U Greenhill Road at Junction with U Long Lane, Garston, L19221/L19301								Liverpool		
								Veh1 NW -> SE Veh2 NE -> NW			Casualties 1 Vehicles2
7	**Road No U Grid 340149E Section Ref 385497N**	SLIGHT	03/08/2012	Fri	10:20	L	Dry	Fine	NONE		P/C
	U Brodie Avenue At Junction With U Whitehedge Road, Liverpool, Merseyside, L19083/L19497								Liverpool		
								Veh1 NW -> SE Veh2 SW -> NE			Casualties 1 Vehicles2
8	**Road No U Grid 340154E Section Ref 385493N**	SLIGHT	17/11/2011	Thu	11:25	L	Wet/Damp	Fine	NONE		
	U Brodie Avenue at Junction with U Whitehedge Road, Liverpool, Merseyside, L19083/L19497								Liverpool		
								Veh1 NW -> SE Veh2 SW -> N			Casualties 1 Vehicles2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
STL	*Street Lights*
USL	*Street Lights Unlit*
NSL	*No Street Lights*
STU	*Street Lights Unknown*

FACTORS

R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

N

5

7

2

1 3 4 6 8

MELBRECK ROAD
EASTCOTE ROAD
SHIRLEY ROAD
BRODIE AVENUE
WHITEHEDGE ROAD
GREENHILL ROAD
KNIGHTSWOOD COURT
HEATH ROAD
RAINHAM CLOSE
STAMFORDHAM DRIVE
VERNEY
NURSERY LANE
West Farm
Club
El Sub Sta
Greenhill Nursery
The Bungalow
Tanks

The City of Liverpool

Liverpool City Council
Transportation Services
4th Floor, Millennium House,
60 Victoria Street, Liverpool L1 6JF

Drawing Status: ACTIVE	Other Ref.: A3
	Scale: NTS

Title: Greenhill Road and Junctions
Data for 01.01.2009 to 31.12.2013

	Survey	Drawn by	Designed	Checked	Approved
Initial		VB			
Date		01.07.2014			

Drawing Number: CDR/2014/11/GHRD

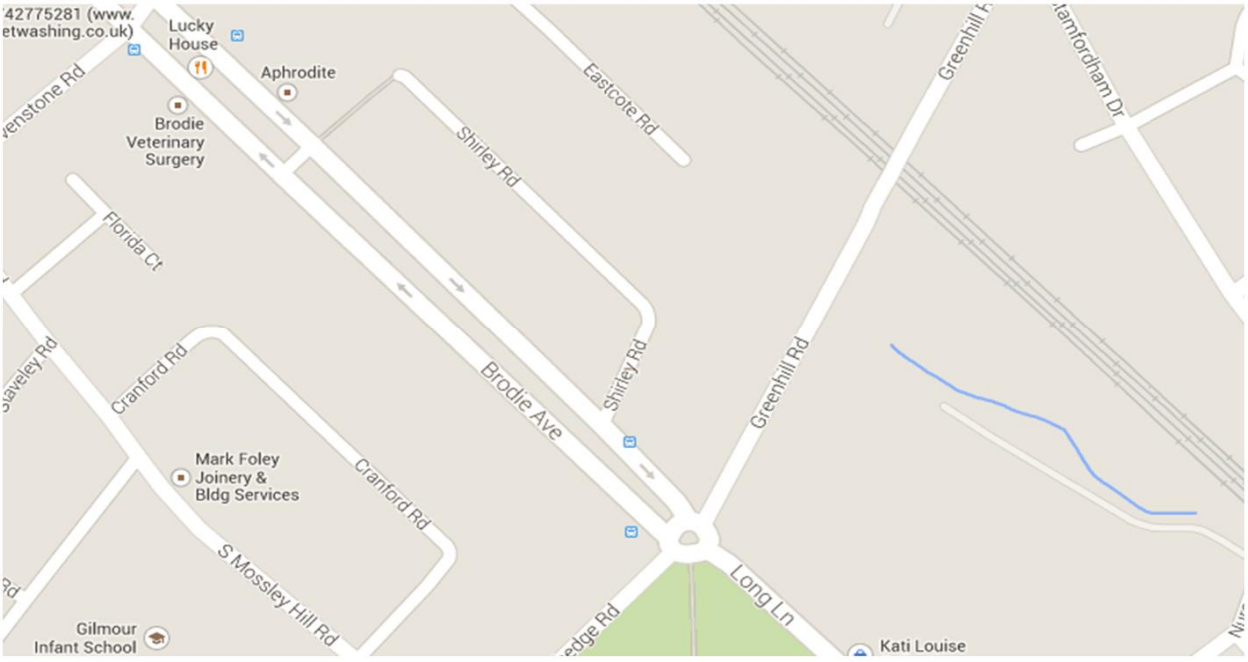
Rev.: 1

APPENDIX D – TRAFFIC COUNT DATA

Sky High
Count On Us

Client:	AECOM
Project:	Allerton -ATC Report
Job Number	9362
Start Date:	27-Jun-14
Site No.	1
Road	Greenhill Road
Location:	100 m North from Greenhill Rd / Long Lane Rbt
Directions	Northbound Southbound

1. Greenhill Road - 100 m North from Greenhill Rd / Long Lane Rbt



Sky High
Count On Us

Job Number	9362
Client	AECOM
Project	Allerton -ATC Report
Location	100 m North from Greenhill Rd / Long Lane Rbt
Site No.	1
Road	Greenhill Road
Day	27-Jun-14
Direction	Combined

Site Speed Limit (mph) 30

Average Speed
30.51
85th Percentile Speed
33.78
Over Speed Limit (%)
46%

Speed Bin Percentage (mph)									
0-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55
0%	1%	2%	10%	40%	36%	9%	2%	0%	0%
55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100+
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Time	Vehicle Speed Bins (mph)																		Speed Statistics			
Period	0-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100+	Average Speed	85th %ile Speed	Slowest Speed	Fastest Speed
00:00	0	0	0	2	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	29.1	N/A	22.0	38.4
00:15	0	0	0	0	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	31.4	N/A	28.4	38.4
00:30	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	35.6	N/A	34.1	37.1
00:45	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	25.8	N/A	10.7	37.1
01:00	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28.3	N/A	26.7	30.4
01:15	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	37.3	N/A	28.4	46.2
01:30	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33.6	N/A	32.9	34.2
01:45	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.6	N/A	19.5	31.4
02:00	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	40.0	N/A	39.2	40.8
02:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	0.0	0.0
02:30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27.7	N/A	27.7	27.7
02:45	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	34.8	N/A	30.4	38.4
03:00	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26.6	N/A	18.2	34.9
03:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	0.0	0.0
03:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	37.9	N/A	37.9	37.9
03:45	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31.2	N/A	25.0	34.5
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	0.0	0.0
04:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	0.0	0.0
04:30	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	40.7	N/A	38.4	43.8
04:45	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	35.5	N/A	31.2	38.3
05:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	36.8	N/A	34.3	39.2
05:15	0	0	0	0	5	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	31.6	N/A	26.4	39.4
05:30	0	0	0	0	2	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	32.9	N/A	25.7	44.0
05:45	0	1	0	0	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	27.4	N/A	11.2	39.0
06:00	0	0	0	0	5	3	2	3	0	0	0	0	0	0	0	0	0	0	0	0	33.9	N/A	25.9	43.9
06:15	0	0	1	1	3	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	31.3	N/A	17.3	39.2
06:30	0	1	1	0	3	7	6	2	0	0	0	0	0	0	0	0	0	0	0	0	32.3	36.5	11.1	44.3
06:45	0	0	0	1	7	12	7	0	0	0	0	0	0	0	0	0	0	0	0	0	32.2	35.7	24.6	39.1
07:00	0	0	0	1	5	11	3	2	0	0	0	0	0	0	0	0	0	0	0	0	32.8	36.2	24.9	43.9
07:15	0	1	0	4	11	11	8	0	0	0	0	0	0	0	0	0	0	0	0	0	30.5	35.1	11.3	39.0
07:30	0	0	0	1	21	43	11	1	0	0	0	0	0	0	0	0	0	0	0	0	31.8	34.1	24.2	42.8
07:45	0	3	2	9	31	42	7	3	1	0	0	0	0	0	0	0	0	0	0	0	30.1	34.5	10.9	47.4
08:00	0	5	2	7	53	60	11	1	0	0	0	0	0	0	0	0	0	0	0	0	29.4	33.6	12.1	40.4
08:15	0	1	0	7	68	49	14	0	0	0	0	0	0	0	0	0	0	0	0	0	30.0	33.3	11.9	39.6
08:30	1	1	4	36	89	49	4	1	0	0	0	0	0	0	0	0	0	0	0	0	27.8	31.9	8.0	44.8
08:45	0	2	0	20	83	60	10	0	0	0	0	0	0	0	0	0	0	0	0	0	29.1	32.7	11.0	39.6
09:00	0	1	0	7	48	51	9	2	0	0	0	0	0	0	0	0	0	0	0	0	29.9	32.3	11.9	40.6
09:15	0	1	0	16	43	41	11	2	0	0	0	0	0	0	0	0	0	0	0	0	29.6	33.7	11.1	43.1
09:30	1	0	0	18	41	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	28.1	32.2	8.9	36.0
09:45	0	0	0	9	53	31	3	2	0	0	0	0	0	0	0	0	0	0	0	0	29.0	32.1	20.9	43.0
10:00	1	1	3	5	33	25	4	1	0	1	0	0	0	0	0	0	0	0	0	0	29.1	32.9	9.3	52.3
10:15	1	1	1	18	39	28	2	1	0	0	0	0	0	0	0	0	0	0	0	0	28.0	31.7	8.3	40.0
10:30	1	1	1	13	29	20	12	0	0	0	0	0	0	0	0	0	0	0	0	0	29.0	33.9	10.0	39.4

10:45	0	0	2	16	38	32	4	1	0	0	0	0	0	0	0	0	0	0	0	0	28.7	32.2	17.4	40.1
11:00	1	2	1	15	28	26	5	0	0	1	0	0	0	0	0	0	0	0	0	0	28.6	32.7	6.5	54.6
11:15	0	3	4	9	30	26	5	0	0	0	0	0	0	0	0	0	0	0	0	0	28.1	32.8	12.9	36.7
11:30	0	0	1	18	37	34	8	3	1	0	0	0	0	0	0	0	0	0	0	0	29.2	33.0	16.9	45.4
11:45	0	1	0	7	42	28	7	2	0	0	0	0	0	0	0	0	0	0	0	0	29.6	33.5	10.3	43.4
12:00	2	0	5	8	35	45	5	0	0	0	0	0	0	0	0	0	0	0	0	0	29.0	32.9	8.7	38.6
12:15	0	1	3	8	30	22	8	0	0	0	0	0	0	0	0	0	0	0	0	0	29.3	33.8	12.4	39.0
12:30	1	3	2	13	52	23	5	1	0	0	0	0	0	0	0	0	0	0	0	0	27.9	31.9	8.8	44.7
12:45	1	0	3	13	39	26	9	1	0	0	0	0	0	0	0	0	0	0	0	0	28.8	33.6	8.4	40.2
13:00	1	2	1	9	46	34	6	1	0	0	0	0	0	0	0	0	0	0	0	0	29.0	33.1	9.9	41.3
13:15	0	2	0	6	26	36	4	1	1	0	0	0	0	0	0	0	0	0	0	0	29.9	33.2	11.9	47.0
13:30	0	0	1	18	28	27	10	0	0	0	0	0	0	0	0	0	0	0	0	0	29.2	33.6	15.1	38.4
13:45	1	1	4	12	33	24	10	0	0	1	0	0	0	0	0	0	0	0	0	0	28.9	34.4	8.2	51.5
14:00	1	2	2	5	30	27	4	2	0	0	0	0	0	0	0	0	0	0	0	0	28.9	33.0	9.0	43.3
14:15	0	3	2	9	39	40	5	1	1	1	0	0	0	0	0	0	0	0	0	0	29.5	33.8	10.5	54.6
14:30	0	0	0	14	48	31	8	1	0	0	0	0	0	0	0	0	0	0	0	0	29.3	33.2	21.4	40.8
14:45	0	0	0	14	50	34	16	1	0	0	1	0	0	0	0	0	0	0	0	0	30.1	33.8	20.4	57.2
15:00	0	1	0	15	62	46	12	5	0	0	0	0	0	0	0	0	0	0	0	0	29.9	34.3	13.7	42.8
15:15	1	5	1	20	81	42	8	0	0	0	0	0	0	0	0	0	0	0	0	0	28.1	32.1	7.2	38.3
15:30	1	2	6	36	83	36	2	2	0	0	0	0	0	0	0	0	0	0	0	0	27.2	31.4	7.5	41.4
15:45	0	0	2	16	45	38	8	1	0	0	0	0	0	0	0	0	0	0	0	0	28.9	32.7	16.6	40.5
16:00	1	1	4	6	38	54	11	1	0	0	0	0	0	0	0	0	0	0	0	0	29.9	34.0	9.9	42.4
16:15	1	1	0	11	58	58	8	2	0	0	0	0	0	0	0	0	0	0	0	0	29.6	33.0	9.8	42.8
16:30	0	2	5	12	50	71	9	2	0	0	0	0	0	0	0	0	0	0	0	0	29.8	34.3	10.3	42.5
16:45	0	5	5	22	58	59	2	2	0	0	0	0	0	0	0	0	0	0	0	0	28.5	33.0	10.9	41.7
17:00	0	1	0	15	75	51	15	1	0	0	0	0	0	0	0	0	0	0	0	0	29.5	33.0	14.5	43.2
17:15	0	2	2	12	71	41	8	0	0	0	0	0	0	0	0	0	0	0	0	0	29.1	32.7	13.6	39.7
17:30	1	3	3	9	45	67	21	2	0	0	0	0	0	0	0	0	0	0	0	0	30.5	34.8	9.7	41.9
17:45	0	0	3	10	53	49	12	0	0	0	0	0	0	0	0	0	0	0	0	0	29.8	33.5	17.8	39.4
18:00	1	1	3	9	42	43	17	4	0	0	0	0	0	0	0	0	0	0	0	0	30.2	35.1	7.3	43.4
18:15	0	1	4	8	40	46	11	1	2	0	0	0	0	0	0	0	0	0	0	0	30.2	34.2	15.0	49.0
18:30	0	0	2	14	29	31	14	4	0	1	0	0	0	0	0	0	0	0	0	0	30.5	36.3	19.1	54.0
18:45	0	2	2	9	31	42	11	3	0	0	0	0	0	0	0	0	0	0	0	0	30.1	34.2	10.1	41.8
19:00	0	0	1	10	36	28	11	1	2	0	0	0	0	0	0	0	0	0	0	0	30.4	34.9	17.3	46.4
19:15	0	1	1	9	43	27	10	2	0	0	0	0	0	0	0	0	0	0	0	0	29.6	33.9	13.0	43.5
19:30	0	1	2	10	21	27	3	1	0	0	0	0	0	0	0	0	0	0	0	0	29.0	33.6	12.6	42.0
19:45	0	0	0	6	33	29	5	3	0	0	0	0	0	0	0	0	0	0	0	0	30.2	33.5	21.2	41.3
20:00	0	0	2	5	30	44	8	3	0	0	0	0	0	0	0	0	0	0	0	0	30.9	34.0	17.0	42.1
20:15	1	1	2	5	21	26	7	0	0	0	0	0	0	0	0	0	0	0	0	0	29.7	34.7	9.9	39.8
20:30	0	0	0	3	16	23	5	2	0	0	0	0	0	0	0	0	0	0	0	0	31.1	34.8	21.0	42.1
20:45	0	0	0	1	30	22	7	2	1	0	0	0	0	0	0	0	0	0	0	0	30.9	35.0	24.9	46.9
21:00	0	0	1	6	23	33	7	2	1	0	0	0	0	0	0	0	0	0	0	0	30.8	34.2	19.5	46.7
21:15	0	0	1	2	20	15	7	2	0	0	0	0	0	0	0	0	0	0	0	0	30.5	35.0	16.4	42.1
21:30	0	0	1	3	9	9	8	0	1	0	0	0	0	0	0	0	0	0	0	0	30.7	35.7	17.6	45.8
21:45	0	0	0	0	20	12	9	1	0	0	0	0	0	0	0	0	0	0	0	0	31.8	35.7	26.5	44.1
22:00	0	2	0	1	14	14	3	2	1	0	0	0	0	0	0	0	0	0	0	0	30.7	35.6	10.3	49.2
22:15	0	0	0	2	11	9	4	1	0	0	0	0	0	0	0	0	0	0	0	0	30.8	34.7	23.9	40.6
22:30	0	0	1	0	7	11	7	2	0	0	0	0	0	0	0	0	0	0	0	0	32.4	36.7	18.5	41.9
22:45	0	0	0	1	5	11	5	2	0	0	0	0	0	0	0	0	0	0	0	0	32.8	36.7	23.8	42.7
23:00	0	1	0	0	7	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	29.8	31.1	11.4	38.3
23:15	0	1	0	2	5	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	30.6	33.8	14.4	37.6
23:30	0	0	0	0	2	7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	33.6	N/A	28.2	42.5
23:45	0	0	0	0	7	10	2	1	0	0	0	0	0	0	0	0	0	0	0	0	31.6	32.7	25.5	43.6
Total	**20**	**75**	**102**	**660**	**2541**	**2262**	**554**	**97**	**13**	**5**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	30.5	33.8	17.4	41.9