

St George's Barracks, Edith Weston

Transport Assessment

Rutland County Council

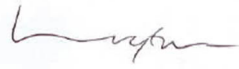
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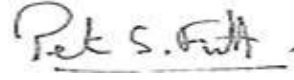
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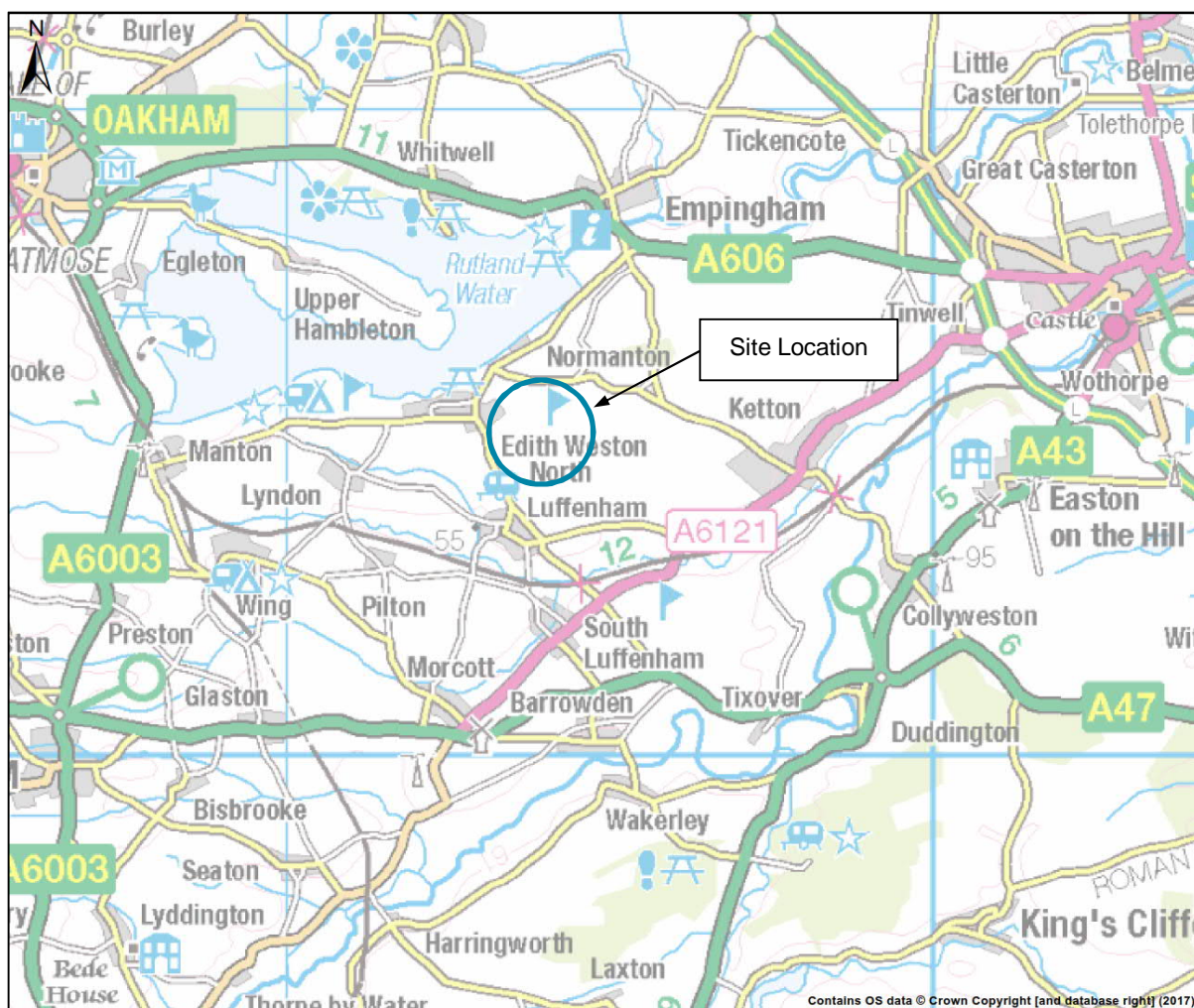
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1. Introduction

1.1 Report Purpose

This Transport Assessment has been prepared on behalf of Rutland County Council (RCC) to provide high level traffic and transport planning recommendations. The advice provided will contribute to the assessment of development options for land currently occupied by St George's Barracks in Edith Weston, Rutland. As part of due diligence procedures RCC are reviewing the impacts of the emerging masterplan for the site on the wider highway network. The site location is shown in Figure 1.

Figure 1: Site Location



1.2 Existing Site Description

The development site currently consists of the St George's Army Barracks and associated surrounding land located close to the village of Edith Weston in the county of Rutland. The existing site area is approximately 286 hectares (ha) split over a number of varying sized sections, as shown within the red boundary line in Figure 2.

The main site is predominately located on land to the east of Edith Weston Road within an area of 282ha bound by Edith Weston Road to the west and Pennine Drive to the north. The remaining area consists of 4ha on land to the west of Edith Weston Road bound to the north by Manton Road and Edith Weston Road to the east.

Figure 2: Site Location



1.3 Report Structure

The following sections of this report are presented as follows:

- Section 2 – Policy Review;
- Section 3 – Baseline Conditions;
- Section 4 – Accessibility;
- Section 5 – Development Proposals;
- Section 6 – Trip Generation & Distribution;
- Section 7 – Traffic Impact Assessment Scope;
- Section 8 – Traffic Impact Assessment;
- Section 9 – Proposed Mitigation; and
- Section 10 – Summary & Conclusions.

2. Policy Review

2.1 Introduction

This section of the report provides an overview of local and national planning policy guidance. Ensuring new developments are in line with relevant planning policies helps to achieve an integrated and simplified approach towards safer, more economical and environmentally friendly sites.

2.2 National Policy

2.2.1 National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) sets out national policy and principles relating to specific aspects of the town planning framework. The NPPF provides a framework for local communities and Authorities to develop relevant local development plans and strategies. The NPPF has two key themes:

- Providing a greater level of integration and simplification of the planning policies governing new development nationally; and
- Contributing to the achievement of sustainable development from an economic, social and environmental perspective.

A Transport Statement or Transport Assessment should support plans for sustainable transportation and limit the generation of significant amounts of movement. Plans and decisions should take account of whether:

- The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major public transport infrastructure;
- Safe and suitable access to the site can be achieved for all people; and
- Improvements can be undertaken within the transport network that cost effectively limits the significant impacts of the development.

Developments should only be prevented or refused on transport grounds where the residual cumulative impacts of development are considered significant. This Transport Assessment assesses the potential impacts of the proposed development and outlines mitigation where deemed necessary.

2.2.2 National Planning Practice Guidance (NPPG)

The National Planning Practice Guidance (NPPG) is used to support the NPPF. Using a web-based application produced by the Department of Communities and Local Government, the framework acts as guidance for applicants, local planning authorities and decision-takers, both in drawing up plans and making decisions about planning applications.

In relation to Transport Assessments, Paragraph: 013 (Reference ID: 42-013-20140306) of the NPPG states that:

‘Local planning authorities must make a judgement as to whether a development proposal would generate significant amounts of movement on a case by case basis (i.e. significance may be a lower threshold where road capacity is already stretched or a higher threshold for a development in an area of high public transport accessibility)’.

In determining whether a Transport Assessment or Statement will be needed for a proposed development local planning authorities should take into account the following considerations:

- The Transport Assessment and Statement policies (if any) of the Local Plan;
- The scale of the proposed development and its potential for additional trip generation (smaller applications with limited impacts may not need a Transport Assessment or Statement);
- Existing intensity of transport use and the availability of public transport;

- Proximity to nearby environmental designations or sensitive areas;
- Impact on other priorities/ strategies (such as promoting walking and cycling);
- The cumulative impacts of multiple developments within a particular area; and
- Whether there are particular types of impacts around which to focus the Transport Assessment or Statement (e.g. assessing traffic generated at peak times).'

In reference to determining an agreed scope in relation to Transport Assessments, Paragraph: 014 (Reference ID: 42-014-20140306) states:

'The need for, scale, scope and level of detail required of a Transport Assessment or Statement should be established as early in the development management process as possible as this may therefore positively influence the overall nature or the detailed design of the development.'

Based on the above, it considered that due to the scale of the proposed development and potential impacts generated by additional traffic movements, a Transport Assessment should be developed.

2.3 Local Policy

2.3.1 Rutland Local Plan

The Local Plan sets out planning policies for Rutland for the period to 2026. Whilst still emerging, the plan currently comprises three documents as follows:

- Core Strategy Development Plan Document (DPD) – adopted July 2011;
- Site Allocations and Policies DPD – adopted October 2013; and
- Minerals Core Strategy and Development Control Policies DPD – adopted October 2010.

The Core Strategy DPD of the Local Plan sets a framework for improved vision, objectives, spatial strategy and planning policy for Rutland, with scope to encourage a sustainable approach to facilitating and promoting growth in the local area.

The following saved policies from the previously adopted Local Plan (2001) are considered relevant to the proposed development:

- Policy HT2 - Traffic Management: 'Planning permission will only be granted for new development which incorporates appropriate traffic management and calming measures in the interests of highway safety'.
- Policy HT3 – Location : Planning permission will be granted for development which:
 - i) is in close proximity and with good access to related land uses;*
 - ii) is in locations minimising the need to travel in terms of the journey quantity and distance;*
 - iii) would not be detrimental to environmental, amenity and highway considerations;*
 - iv) is in locations which facilitates alternative forms of transport to the private car; and*
 - v) in the case of major development has good access to the specified road network.*
- Policy HT4 - Traffic Increase: 'Planning permission will not be granted for any development which would be likely to result in an increase in traffic, particularly heavy vehicles and / or parking, on roads unsuited to such usage, if it would:
 - i) result in unacceptable levels of congestion*
 - ii) be a road safety hazard*
 - iii) be detrimental to the amenity of surrounding properties and the locality, or*
 - iv) be detrimental to the environment.'*
- Policy HT6 – Parking standards: 'Planning permission will be granted for new development which makes provision for the parking of vehicles, including motor cycles, cycles and the servicing of premises clear of the highway and where it would not be detrimental to environmental, amenity or other highway considerations.'

- Policy HT9 – Provision for pathways and cycle ways: 'Planning permission will only be granted for development which makes appropriate provision for footpaths and cycle ways, segregated wherever possible from roads and designed as an integral part of the development such provision should wherever possible provide safe and convenient access to:
 - i) other parts of the development including any community and other facilities provided;*
 - ii) adjacent development areas and community and other facilities; and*
 - iii) any cycleway or footpath network beyond the development. Footpaths should be designed to have regard to the needs of children, the elderly, the mobility impaired and persons with prams.'*

- Policy HT10 – Public Transport: 'Planning permission will only be granted for major *development which facilitates service by public transport through:*
 - i) ensuring convenient access to and from the development where necessary;*
 - ii) providing convenient routes through the development;*
 - iii) providing associated facilities for bus passengers;*
 - iv) providing convenient footpath access to bus stops; and*
 - v) improving off-site highway infrastructure to facilitate ease of bus access to the development.'*

2.4 Summary

Based on the above, it is considered that the site accords with relevant national and local guidance and policy, assuming good on-site masterplanning and appropriate off-site mitigation is introduced. It is also considered that due to the scale of the proposed development and potential impacts generated by additional traffic movements, a Transport Assessment should be developed.

3. Baseline Conditions

3.1 Introduction

This section of the report provides details on the existing conditions of the local and wider road network in the vicinity of the site, identifying the key junctions and roads that would predominantly be affected by traffic generated by the proposed masterplan. The section also outlines the accidents that have occurred on the local roads in the previous five years.

3.2 Existing Highway Network

An assessment of the existing local highway network has been undertaken. The local road network, as shown in Figure 3 generally consists of single carriageway, rural de-restricted roads that provide access to the surrounding towns / villages. This ultimately provides access to the larger towns of Oakham, Newark, Grantham, Stamford, Peterborough, Kettering, Leicester and Nottingham. The key road links are summarised below:

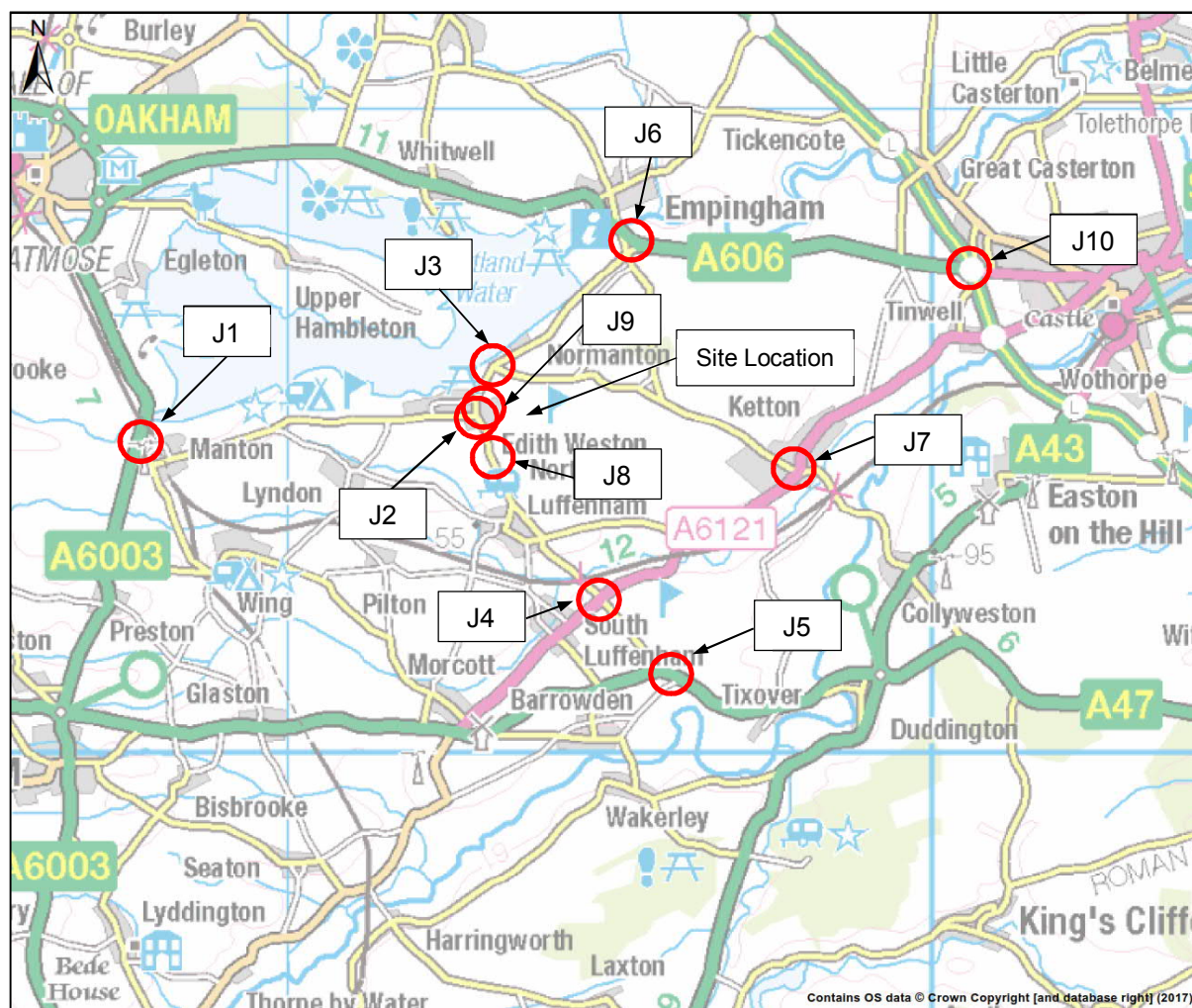
- Key road network links
 - Edith Weston Road;
 - Manton Road / Lyndon Road;
 - Normanton Park Road;
 - A6003;
 - A606;
 - A6121;
 - A47; and
 - A1.

For each of the above road links existing traffic collected from traffic counts undertaken in October 2017 has also been referenced.

Nine key junctions likely to be affected by the additional traffic movements have been identified in the vicinity of the Barracks. The nine key junctions are listed below and shown in Figure 3.

- Key junctions
 - J1: A6003 / Lyndon Road Junction;
 - J2: Edith Weston Road / Manton Road / Normanton Park Road Junction;
 - J3: Normanton Park Road / Wytchley Warren Lane;
 - J4: Station Road / A6121;
 - J5: Station Road / A47;
 - J6: A606 / Normanton Park Road Junction;
 - J7: A6121 / Empingham Road;
 - J8: Existing Barracks Access, Edith Weston Road;
 - J9: Normanton Road / Pennine Drive; and
 - J10: A606 / A1.

Figure 3: Key Junctions



3.2.1 Edith Weston Road

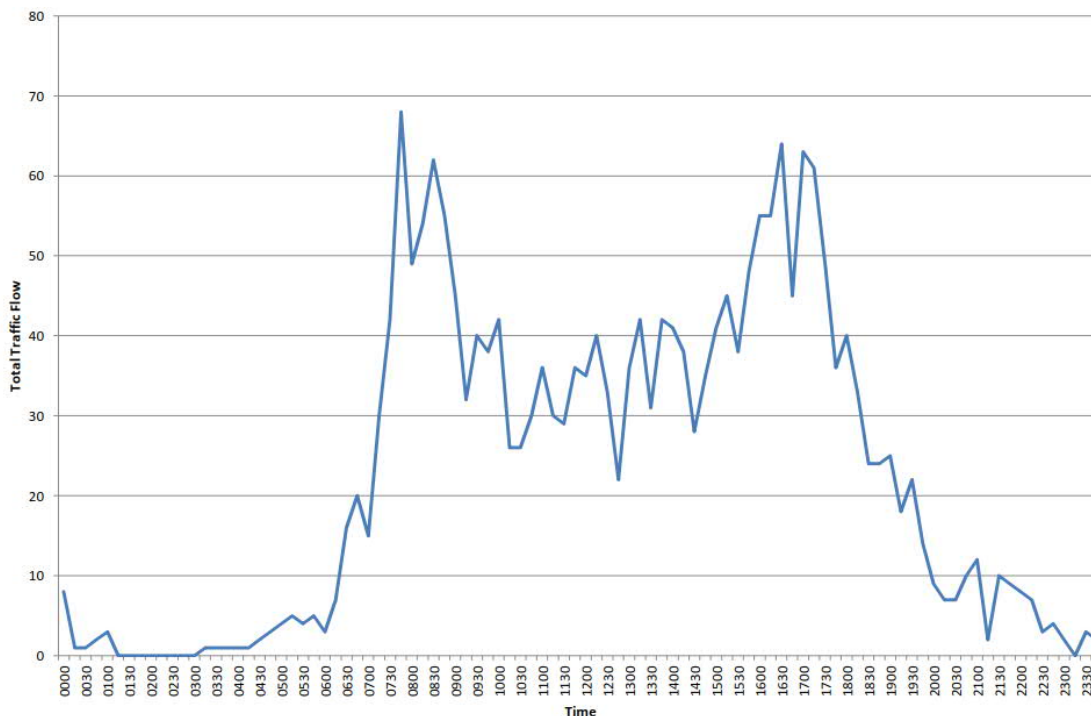
Edith Weston Road is a single carriageway road which runs along the western site boundary of the main Barracks site, providing access to the A6121 and A47 to the south and the village of Edith Weston to the north. Street lighting is only provided at the northern junction with Manton Road, at the southern junction with the A6121 and within the parameters of North Luffenham village.

The speed limit is mainly de-restricted (60mph), however a 30mph speed limit is enforced to the south of the main site access to the Barracks. A 40mph section is also enforced within the parameters of the village of North Luffenham.

Footways are provided along the western carriageway from the northern junction to North Luffenham to the Main Site access of the Barracks, from this point the footway continues along the eastern edge of the carriageway to the mini roundabout junction with Manton Road / Normanton Park Road. Within the vicinity of the mini roundabout junction a footway is also provided along the western edge of the carriageway.

Based on the traffic counts, at a location south of the existing Barracks junction, the two-way weekday 24 hour flow was approximately 2,192. The 24 hour flow profile is shown in Figure 4. This shows the total traffic flow counted in 15 minute periods throughout the day.

Figure 4: Edith Weston Rd 24 Hour Flow Profile



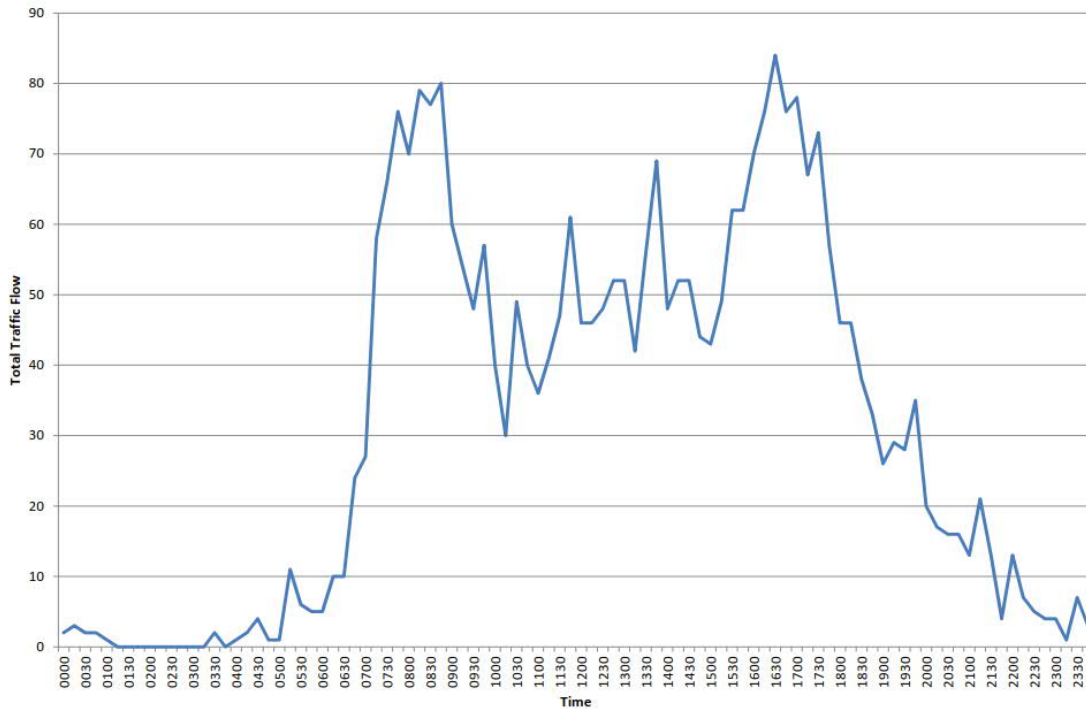
3.2.2 Manton Road

Manton Road is the main road through the village of Edith Weston and is a single carriageway with a speed limit of 30mph. Street lit footways are provided on both sides of the carriageway within the village of Edith Weston, however are not provided on Manton Road outside of the village to the west. There is a footway along the southern edge of the carriageway through the village of Manton.

Manton road provides access to A6003 to the west and Edith Weston Road and Normanton Road to the east.

Based on the traffic counts, at a location on Manton Road, the two-way weekday 24 hour flow was approximately 3,010. The 24 hour flow profile is shown in Figure 5. This shows the total traffic flow counted in 15 minute periods throughout the day.

Figure 5: Manton Rd 24 Hour Two-Way Flow Profile

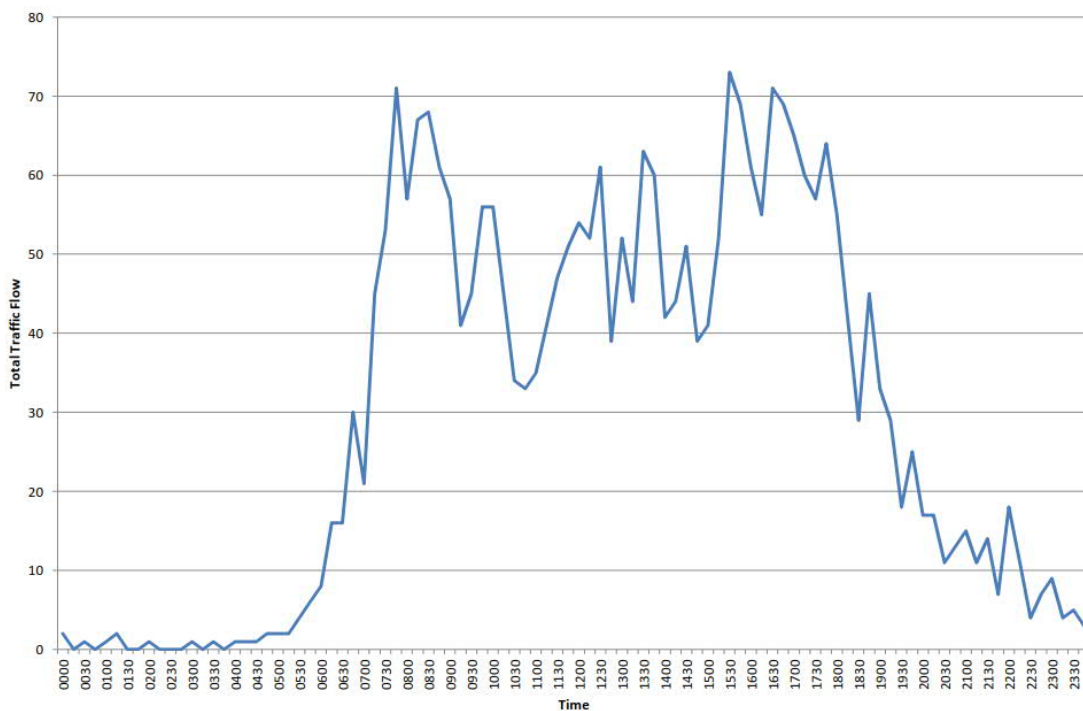


3.2.3 Normanton Park Road

Normanton Park Road provides access to the village of Normanton and the A606 to the north and Edith Weston to the west in the form of a single carriageway. The speed limit is mainly 60mph, however within the village of Edith Weston a 30mph limit is in place. Street lighting and footways are provided.

Based on the traffic counts, at a location on Normanton Park Road, the two-way weekday 24 hour flow was approximately 2,862. The 24 hour flow profile is shown in Figure 6. This shows the total traffic flow counted in 15 minute periods throughout the day.

Figure 6: Normanton Park Rd 24 Hour Flow Two-Way Profile



3.2.4 A6003

The A6003 provides a strategic link between Oakham and Corby and on to the A14. The A6003 provides access to the A47 to the south via a five-arm roundabout and A606 and to the B640 to the north via a four-arm roundabout. The A6003 generally has a national speed limit imposed, slowing to 50mph between Oakham and Lyndon Road and to 40mph either side of this junction. It should be noted that there are several 30mph speed restrictions applied through Preston, Uppingham, Caldecott and Rockingham.

Street lighting is generally not provided except within the vicinity of junctions and areas of residential villages.

Based on the traffic counts, at a location north of the junction with Lyndon Road, the estimated two-way weekday 24 hour flow was approximately 11,181. South of the junction, the flow was 9,751.

3.2.5 A606

The A606 provides local access between Oakham and Stamford, with a strategic link eastwards to the A1. The A606 is a single carriageway providing access to the A6003 to the west via a four-arm roundabout and the A1 to the east. The A606 between Oakham and Stamford generally has a national speed limit imposed, slowing to 40mph through Empingham and 30mph through Whitwell and Stamford.

Street lighting is generally not provided along this section of road, however within the vicinity of junctions and areas of residential villages street light is provided and at the A1 and A6003 junctions.

Based on the traffic counts, at a location east of the junction with Normanton Park Road, the two-way weekday 24 hour flow was approximately 10,436. West of the junction, the flow was 9,652.

3.2.6 A6121

The A6121 is a single carriageway road providing a local link between Stamford and South Luffenham (via Ketton) and also provides strategic access to the A47 to the west and A1 to the east. The A6121 generally has a national speed limit imposed, slowing to 40mph at its intersection with Station Road (Junction 4 as indicated on Figure 3) and also on entrance into Ketton. A 30mph restriction is imposed through South Luffenham, Ketton, Tinwell and Stamford, slowing to 20mph around Ketton C of E Primary School / Library. Street lighting is generally not provided along its entirety, however within the vicinity of junctions and areas of residential villages street lighting is provided.

Based on the traffic counts, at a location east of the junction with Station Road, the two-way weekday 24 hour flow was approximately 6,799. West of the junction, the flow was 4,850.

3.2.7 A47

The A47 provides a strategic route between Leicester and Peterborough with the road alignment running in an easterly and westerly direction. The A47 is mainly a single carriageway, forming in to a dual carriageway within the vicinity of its junction with Sutton through to Peterborough. The A47 generally has a national speed limit imposed, yet restrictions vary from 30, 40 and 50mph as the road passes through the county.

Street lighting is mainly not provided along its entirety, however within the vicinity of junctions and areas of residential villages street lighting is provided.

Based on the traffic counts, at a location east of the junction with Station Road, the two-way weekday 24 hour flow was approximately 9,293. West of the junction, the flow was 7,784.

3.2.8 A1

The A1 is a strategic long distance route between London and Edinburgh. In this location, the A1 is a two lane dual carriageway road, with a barriered central reserve and the national speed limit imposed.

Street lighting is not apparent on the section of the A1 being reviewed. The road is managed by Highways England and provides local links to local settlements such as Peterborough, Grantham, Newark and Cambridge, but also to towns and cities further afield such as London and Leeds.

Based on traffic counts collected from the WebTRIS database at a location north of the junction with the A606, the two-way 24 hour flow was 46,758. South of the junction the flow was 49,663.

3.2.9 J1: A6003 / Lyndon Road

The junction is a three-arm priority junction located approximately 6km to the west of the Barracks, providing access north to Oakham along the A6003 and south towards the A47 near Uppingham.

All approaches are single lanes with the exception of the A6003 northbound approach, which has a right turn lane. The northbound and southbound approaches along the A6003 are segregated by a kerbed central reserve with right turning capacity of approximately 4 vehicles into Lyndon Road and the farm access.

The A6003 generally has a national speed limit imposed with some 50mph sections of road and a 40mph limit on the approach from Lyndon Road. No footway facilities or street lighting are provided at the junction.

Results from assessments carried out at this junction indicate that currently the junction operates under capacity.

3.2.10 J2: Edith Weston Road / Manton Road / Normanton Park Road

This junction is a 3-arm mini roundabout located to the north-west of the Barracks in the village of Edith Weston. The junction also provides access to the village of Normanton and the A606 to the north. The roads on the approaches to the junction have a 30mph speed limit.

All approaches are single lanes with two kerbed islands located on Manton Road and Normanton Road and a lined island on the Edith Weston Road approach. Street lighting is provided at the junction with pedestrian footways on all approaches. An informal crossing facility in the form of tactile paving and dropped kerbs are provided on Normanton Road at the kerbed island.

Results from assessments carried out at this junction indicate that currently the junction operates under capacity.

3.2.11 J3: Normanton Park Road / Wytchley Warren Lane

The junction is a three-arm priority T-junction located approximately 1.2km north of the Barracks, providing access to Empingham, Stamford and the A1 along the A606.

The approach on Wytchley Warren Lane is a narrow single carriageway with limited road markings / signage and a national speed limit of 60mph. The Normanton Park Road approach is a single carriageway in both directions with a national speed limit of 60mph and more adequate signage provided. The mouth of the junction provides a wide berth for vehicles, yet care must be taken when entering / exiting due to oncoming cars obscured to the northbound side by vegetation.

Results from assessments carried out at this junction indicate that currently the junction operates under capacity.

3.2.12 J4: Station Road / A6121

The roundabout is located approximately 3.8km southeast of the Barracks, providing access between Edith Weston, Ketton, South Luffenham and the A47 eastbound towards Duddington village.

The approaches are single carriageway, have adequate lighting and an imposed speed limit of 40mph. The A6121 single carriage approach splits into two lanes; a left turn and a straight ahead / right turn. Heading away from the roundabout, Station Road to the north / south and the A6121

eastbound have national speed limits of 60mph, whilst the A6121 west has a 30mph limit for cars entering South Luffenham. No footpaths are provided.

Results from assessments carried out at this junction indicate that currently the junction operates under capacity.

3.2.13 J5: Station Road / A47

The junction is a three-arm priority T-junction located approximately 5.4km southeast of the Barracks. Station Road meets the A47 which travels east towards Peterborough and west towards Uppingham.

The southbound approach on Station Road is single carriageway with a national speed limit of 60mph. The approach from the east and west of the A47 (also 60mph) provides a wider single carriageway with more appropriate signage and road markings. At the junction, hazard signs warn drivers of the sharp corner ahead using black / white chevrons.

Results from assessments carried out at this junction indicate that currently the junction operates under capacity.

3.2.14 J6: A606 / Normanton Park Road

This junction is a three-arm priority access with a right turn ghost island, located approximately 4km to the north-east of the Barracks. The junction provides access onto the A606 and onward to Oakham to the west and Stamford and the A1 to the east.

All approaches are single lanes with the exception of the right turn ghost island along the A606 eastbound approach. Left turning traffic from the A606 westbound approach is required to give way to right turning traffic from the right turn ghost island after exiting the main carriageway. There is also a specific left turn lane on the Normanton Park Road approach, which has capacity for approximately two vehicles. The speed limit on all approaches to the junction is 60mph with no street light or footways in place.

Results from assessments carried out at this junction indicate that currently the junction operates under capacity.

3.2.15 J7: A6121 / Empingham Road

The junction is made up of a crossroads in the centre of Ketton village, located approximately 6.4km southwest of the Barracks. The junction forms a crossroad between the A6121 to the northeast / southwest, Empingham Road to the northwest and Church Road to the southeast.

The approach on the A6121 is a single carriageway road, with a speed limit of 30mph from the west and 20mph from the east. This is likely in place because of the C of E Primary School located 200m northeast of the junction. A number of 'Slow' road markings and signage warn drivers of the approaching hazards. Entering north of the junction, Empingham Road is a mostly unmarked rural route that similarly slows from 60 to 30mph. From the south, the similarly sized Church Road / Station Road is an unmarked rural road with a number of narrow passing places (over the River Chater) and an enforced speed limit of 30mph.

Footpaths along the side of the A6121 are adequate with clearly marked, safe pedestrian crossing facilities provided.

Results from assessments carried out at this junction indicate that currently the junction operates under capacity.

3.2.16 J8: Existing Barracks Access, Edith Weston Road

This is a private access that currently serves the main Barracks site, which forms a priority junction with Edith Weston Road. There are no footpaths surrounding the access and there is a one lane approach on the side road.

3.2.17 J9: Normanton Road / Pennine Drive

This junction is a major / minor priority junction that provides access to residential and commercial properties along with North Luffenham golf course on Pennine Drive.

3.2.18 J10: A606 / A1

This junction of the A1 is a compact grade separated junction that provides a link with the A606. The A606 provides onward journeys towards Oakham and Melton Mowbray to the west and Stamford to the east. The junction has long merge / diverges with the A1 and smaller priority junctions with the A606. The priority junctions with the A606 have single lane approach roads and no right turning facility on the A606 itself. There are limited pedestrian facilities around the priority junctions. Results from assessments carried out at this junction indicate that currently the junction operates under capacity.

3.3 Existing Site Accesses

Existing vehicular access points to the Barracks are provided off Manton Road / Edith Weston Road for the western site and from Edith Weston Road / Welland Road for the main Barracks site. It should be noted that two of the accesses located off Welland Road have now been fenced off and are no longer in operation. The access points to both sections of land within the Barracks are detailed below.

- Main Barracks Site (282 ha)
 - Edith Weston Road;
 - Pennine Drive; and
 - Welland Road – three access points of which two are no longer operational and one provides access to the airfield.
- Western Site (4 ha)
 - Manton Road; and
 - Edith Weston Road.

3.4 Road Safety

This section indicates the personal injury accidents that have occurred within the study area over the last full five year period (2012-2016). The data has been used to assess if there are currently any areas for concern on the local road network. A plan of the accidents is provided in **Appendix A**.

3.4.1 Edith Weston Road

Edith Weston Road has been reviewed over the 5 year period between the A47 junction and the proposed site. During this time 18 accidents occurred, including: 14 slight and 4 serious, with no reports during 2016. Of these accidents listed in Table 1 below, two junctions appeared to be hotspots. The Station Road / A6121 roundabout had five incidents (slight to serious) and the A47 slip road had four. Five of the nineteen incidents occurred in darkness.

Table 1: Edith Weston Road Incidents

Date	Slight	Serious	Fatal	Total
2012	2	3	0	5
2013	6	0	0	6

2014	2	0	0	2
2015	4	1	0	5
2016	-	-	-	-
Total	14	4	0	18

3.4.2 Manton Road

Manton Road has been reviewed over the 5 year period between the A6003 and site. During this time 8 accidents occurred, including: 4 slight; 3 Serious and 1 Fatal. Of these listed in Table 2 below, the number of vehicles involved was frequently no greater than one or two, with the exception of a single incident involving three vehicles in 2012. The section located approximately half way between the A6003 turnoff (Lyndon Road) and the proposed site saw four incidents with one serious and one fatal.

Table 2: Manton Road Incidents

Date	Slight	Serious	Fatal	Total
2012	0	2	0	2
2013	1	0	0	1
2014	1	0	0	1
2015	1	1	1	3
2016	1	0	0	1
Total	4	3	1	8

3.4.3 Normanton Park Road

Normanton Park Road has been reviewed over the 5 year period between Edith Weston and the A606. During this time 7 accidents occurred, including 6 slight and 1 serious. Of these listed in Table 3 below, four slight incidents occurred at the A606 / Normanton Park Road junction. In 2013, two separate incidents occurred in close proximity of each other whilst entering Edith Weston village.

Table 3: Normanton Park Road Incidents

Date	Slight	Serious	Fatal	Total
2012	0	0	0	0
2013	3	1	0	4
2014	0	0	0	0
2015	2	0	0	2
2016	1	0	0	1
Total	6	1	0	7

3.4.4 A6003

The A6003 has been reviewed over the 5 year period between the Catmose turn-off and A47 roundabout. During this time 18 accidents occurred, including 17 slight and 1 fatal. Of these incidents listed in Table 4 below, a concentration of accidents is particularly focused during peak rush hour times around roundabouts and a number of give way T-junctions. The single fatality in 2015 was located adjacent to the River Gwash, along a 60mph double white lined section of road at 05:45 in the morning.

Table 4: A6003 Incidents

Date	Slight	Serious	Fatal	Total
------	--------	---------	-------	-------

2012	3	0	0	3
2013	4	0	0	4
2014	4	0	0	4
2015	4	0	1	5
2016	2	0	0	2
Total	17	0	1	18

3.4.5 A606

The A606 has been reviewed over the 5 year period between the Burley Park Way roundabout and the A1 junction. During this time 33 accidents occurred, including 23 slight and 10 serious.

Table 5: A606 Incidents

Date	Slight	Serious	Fatal	Total
2012	6	1	0	7
2013	8	2	0	10
2014	4	0	0	4
2015	2	4	0	6
2016	3	3	0	6
Total	23	10	0	33

3.4.6 A6121

The A6121 has been reviewed over the 5 year period between A47 and A1 junctions. During this time, 17 accidents occurred, including 16 slight and 1 serious. Of these listed in Table 6 below, the majority of incidents occurred at give way sections such as T-junctions, roundabouts and private drive accesses. In 2012 and 2013 incidents involving the pedestrian crossing close to Ketton Library and C of E Primary School were recorded as 'slight'. Since these two reports, no further incidents have occurred. The Station Road / A6121 roundabout has had five incidents (slight to serious) between 2012 and 2015, with none occurring in 2016.

Table 6 A6121 Incidents

Date	Slight	Serious	Fatal	Total
2012	4	1	0	5
2013	4	0	0	4
2014	3	0	0	3
2015	3	0	0	3
2016	2	0	0	2
Total	16	1	0	17

3.4.7 A47

The A47 has been reviewed over the 5 year period between the A6003 / Ayston Road and A43 roundabout. During this time 41 incidents occurred, including 25 slight, 13 serious and 3 fatal. The road is a single carriage, A-road with a number of speed restrictions between 30-60mph. Of the accidents listed in Table 7, nine of the incidents occurred where no lighting was provided during hours of darkness; fourteen were at crossroads and roundabouts with T-junctions accounting for all three fatalities.

Table 7: A47 Incidents

Date	Slight	Serious	Fatal	Total
2012	8	5	1	14
2013	7	1	0	8
2014	5	4	0	9
2015	4	2	1	7
2016	1	1	1	3
Total	25	13	3	41

4. Sustainable Accessibility

4.1 Introduction

This section considers the existing provision for sustainable travel modes to and from the proposed site.

4.2 Pedestrian Access

This section outlines the existing provision of pedestrian facilities surrounding the site.

Although superseded by the NPPF, Planning Policy Guidance note 13 remains a document which is still considered to provide relevant advice regarding accessibility and states that: 'Walking is the most important mode of travel at the local level and offers the greatest potential to replace short car trips, particularly under 2 kilometres. Walking also forms an often forgotten part of all longer journeys by public transport and car'.

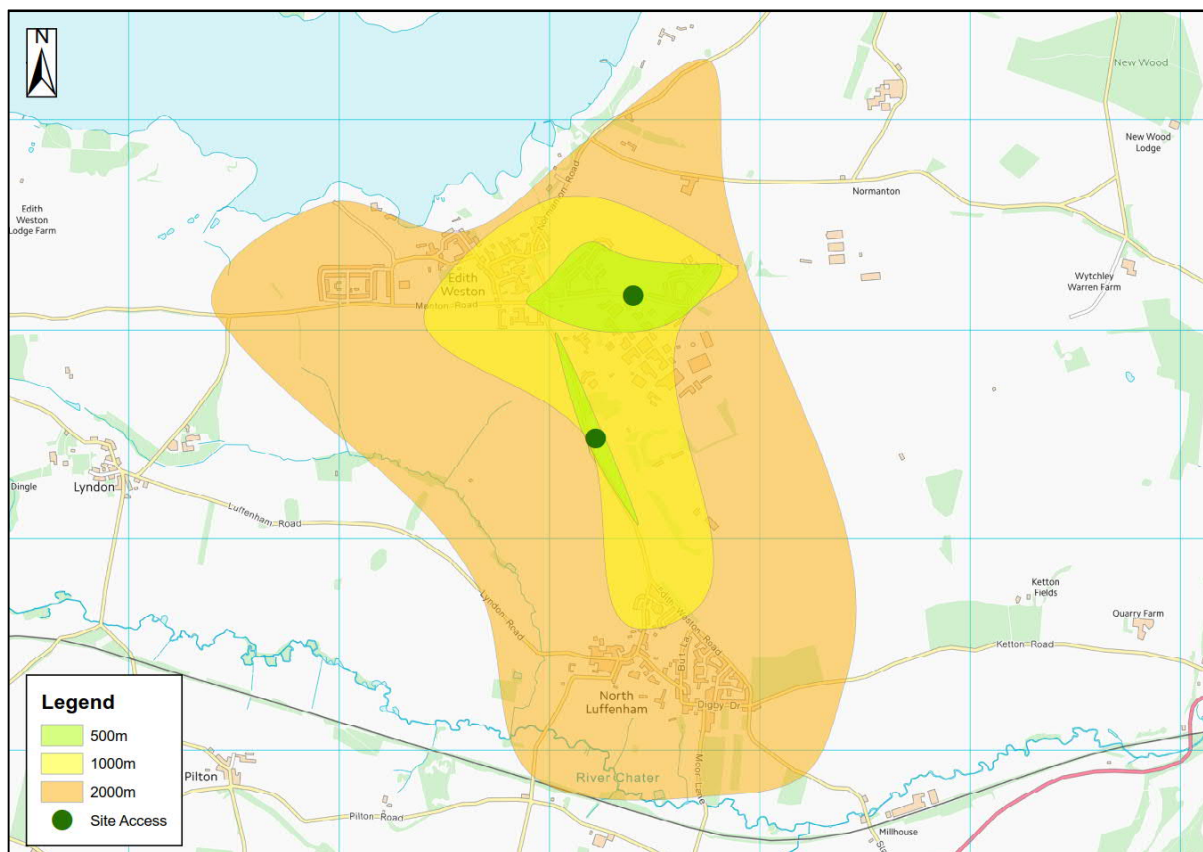
Table 8 below provides an extract from 'Guidelines for Providing for Journeys on Foot' by the Chartered Institute of Highways and Transportation (CIHT) which suggests acceptable walking distances for different types of journeys.

Table 8: Suggested Acceptable Walking Distances

	Town Centres (m)	Commuting (m)	Elsewhere (m)
Desirable	200	500	400
Acceptable	400	1000	800
Preferred maximum	800	2000	1200

Using the CIHT guideline walking distances, a plan illustrating indicative 500m, 1000m and 2000m catchment areas from the site has been produced using GIS software, shown in Figure 7 below. A number of public rights of way lead to / from the site providing accessible routes to well-lit roads and residential areas within the CIHT preferred maximum walking distance of 2km.

Figure 7: Walking Accessibility Map



As can be seen in Figure 7, a 2km walking distance covers the majority of Edith Weston village which can be accessed via Manton Road, Edith Weston Road and Normanton Road. Sufficiently wide footpaths, dropped kerbs and pedestrian crossing facilities are provided at several points in the vicinity of the site, providing links to a number of local amenities (amongst others): Public House (750m); Post Office (800m) and Edith Weston Primary School (1.3km). It is noted that street lighting is not always provided.

Considering the above, it is concluded that the proposed development site is relatively accessible to amenities on foot with the ability to cater for the level of potential pedestrian demand expected.

4.3 Cycling Access

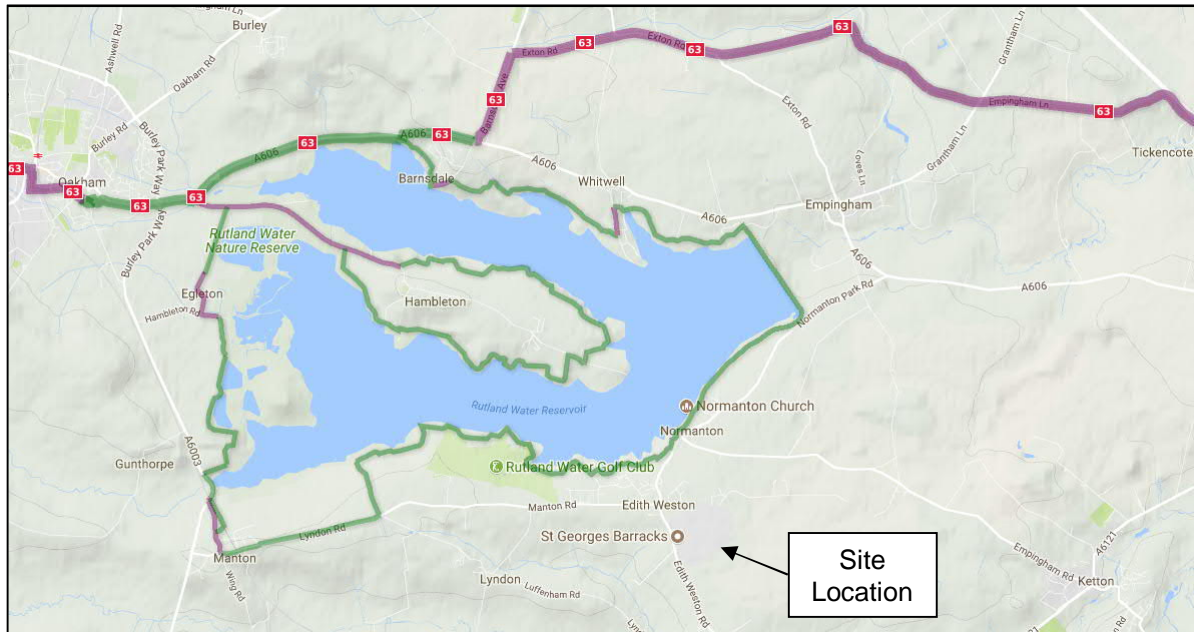
This section outlines the existing provision of cycling facilities surrounding the site.

Figure 8 presents the Sustrans National Cycle Network (NCN) in the vicinity of the site. The closest access to Route 63 is located approximately 10km northwest of the site, on the eastern edge of Oakham. The route travels for 113 miles from Burton on Trent passing through the large cities of Leicester, Stamford and Peterborough before arriving at Wisbech.

The Local circular Route around Rutland Water Reservoir runs for approximately 23km. It starts in Oakham and joins the waterside path towards Whitwell and the nearby Butterfly center, shown in Figure 8.

Due to the rural nature of the area and relatively low traffic on smaller roads, the area is considered suitable for cycle journeys.

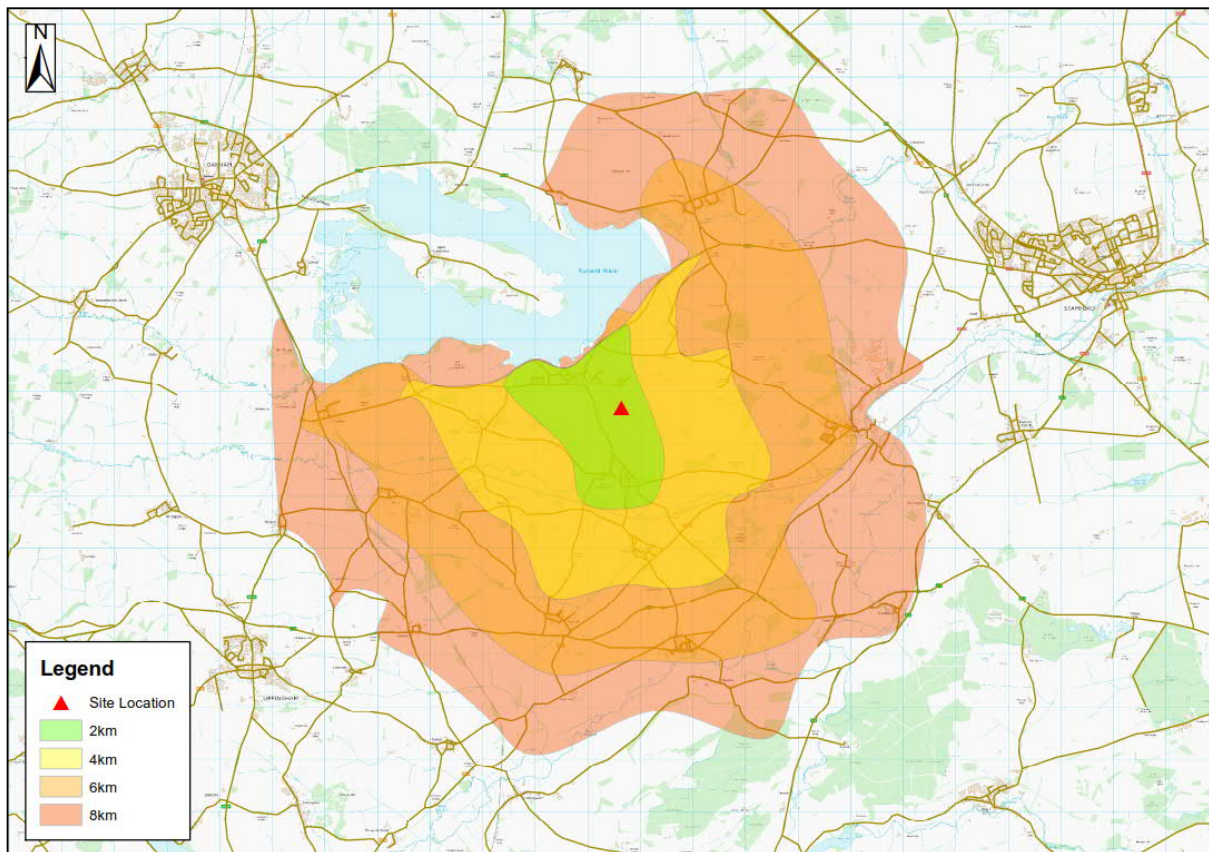
Figure 8: Cycle Routes in the Vicinity of the Site



In respect of acceptable cycle distances, 'Local Transport Note 2/08: Cycling Infrastructure Design', published by DfT states that many utility cycle trips are less than three miles (approximately 5km) but for commuter journeys a distance 10km is not uncommon.

Taking this into account, a plan illustrating indicative 2km, 4km, 6km and 8km catchment area from the proposed development site has been produced using GIS software, and is shown in Figure 9.

Figure 9: Cycling Accessibility Map



The site is connected to the Reservoir Cycle Route via two roads: Normanton Road links the site with Empingham village approximately 5km to the northeast; and Manton / Lyndon Road connect to Manton village approximately 5.7km to the west.

Based on Figure 9 areas such as Oakham, Manton, Wing, Pilton, South Luffenham and the northern edge of Morcott are accessible within the acceptable distance.

It is therefore considered that the site is accessible by cycle and that this provides a realistic alternative to the private car to travel to and from the site.

4.4 Public Transport

4.4.1 Bus

The nearest bus stop is located at the Wheatsheaf on Manton Road, approximately 400m to the west of the site. Details of the relevant services are presented in Table 9, and routes within the area shown in Figure 10.

Table 9: Bus Services

Service	Route	Frequency		
		Mon-Fri	Sat	Sun
12	Stamford - Uppingham	Every 2hrs	Every 2hrs	No service

Note: Services typically between 0730 and 1820

Figure 10: Bus Services Map



Whilst the bus stop is relatively close to the site, the number and frequency of services is low.

4.4.2 Train

The nearest train station to the proposed site is at Oakham. It is situated approximately 11.5km travel distance northwest of the site, which is at the upper limit of range for commuter journeys made to the site by cycle. Stamford station lies on the same railway line, located approximately 14.2km east of the site and similarly is at the upper limit of commuter journeys by cycle.

Due to the residential element of the development, home owners may require access to local train stations by car, however they may not be prepared to drive these distances to a station unless they were travelling further afield (e.g. to London).

Table 10 details rail services from Oakham, with a number of station links shown in Figure 11.

Table 10: Oakham Train Services

Destination	Duration	Frequency		
		Mon-Fri	Sat	Sun
Stamford	13mins	Hourly	Hourly	Hourly
Peterborough	27mins	Hourly	Hourly	Hourly
Leicester	27mins	Hourly	Hourly	Hourly
Birmingham New Street	1hr 20mins	Hourly	Hourly	Hourly
Cambridge	1hr 15mins	Hourly	Hourly	Hourly

Note: Services typically between 06:30 and 22:30

Figure 11: Rail Services



4.5 Summary

The site has adequate accessibility for walking and cycling within the vicinity, with a number of local villages and amenities that can be accessed within the maximum distances provided. Public transport to and from the site is considered poor with a single bus service running every 2hours from Manton Road and the nearest train station located at the upper limit for commuter journeys made partly by cycle.

5. Development Proposals

5.1 Introduction

This section outlines the development proposals for the St Georges Barracks site.

5.2 Proposed Development

AECOM have been advised that development of the site could take place between the years 2021 and 2041. It is proposed that the development would be split into distinct areas and built out rates, as outlined below:

- Officer's Mess
 - 70 residential units, to be completed in 2021.
- Main Site (Western Area)
 - 3,000 residential units, built at a rate of 300 units per year between 2022 and 2031
 - 55,600 m² Gross Floor Area (GFA) B1 / B2 / B8 employment land, built at a rate of between 2,000–8,000 m² per year between 2021 and 2032.
 - 5,600 m² GFA B1 / B2 / B8 employment land built at a rate of 1,400 m² per year between 2038 and 2041.
- Main Site (Eastern Area)
 - 500 residential units, built at a rate of 100–150 units per year between 2038 and 2041.

The current site masterplan is provided in **Appendix A** and further details of the proposed development build out rates by land use are provided within **Appendix B**.

The employment land use proposed has been split between B1 (Office), B2 (Light Industrial) and B8 (Warehousing) by the masterplanners and will be provided within the Western area of development. The split between the different employment land uses is outlined as follows:

Table 11: Employment Land Split

Development Area	Site Area	GFA	Land Use Type		
			B1	B2	B8
Western Area	7.7 Ha	33,600 m ²	21%	42%	37%
	5 Ha	22,000 m ²	33%	33%	33%
	1.3 Ha	5,600 m ²	21%	42%	37%

5.3 Proposed Access – Officer's Mess

It is proposed that access into the Officer's Mess site area would be taken from the existing access off Manton Road. Based on the small number of additional vehicle movements predicted as part of this site, the existing access is considered practicable for future use. An additional access also exists on Edith Weston Road, which could also be utilised as part of the development.

5.4 Proposed Access – Main Site (Western Area)

For the Western Area access is proposed from the existing Barracks main access points off Edith Weston Road and via Pennine Drive.

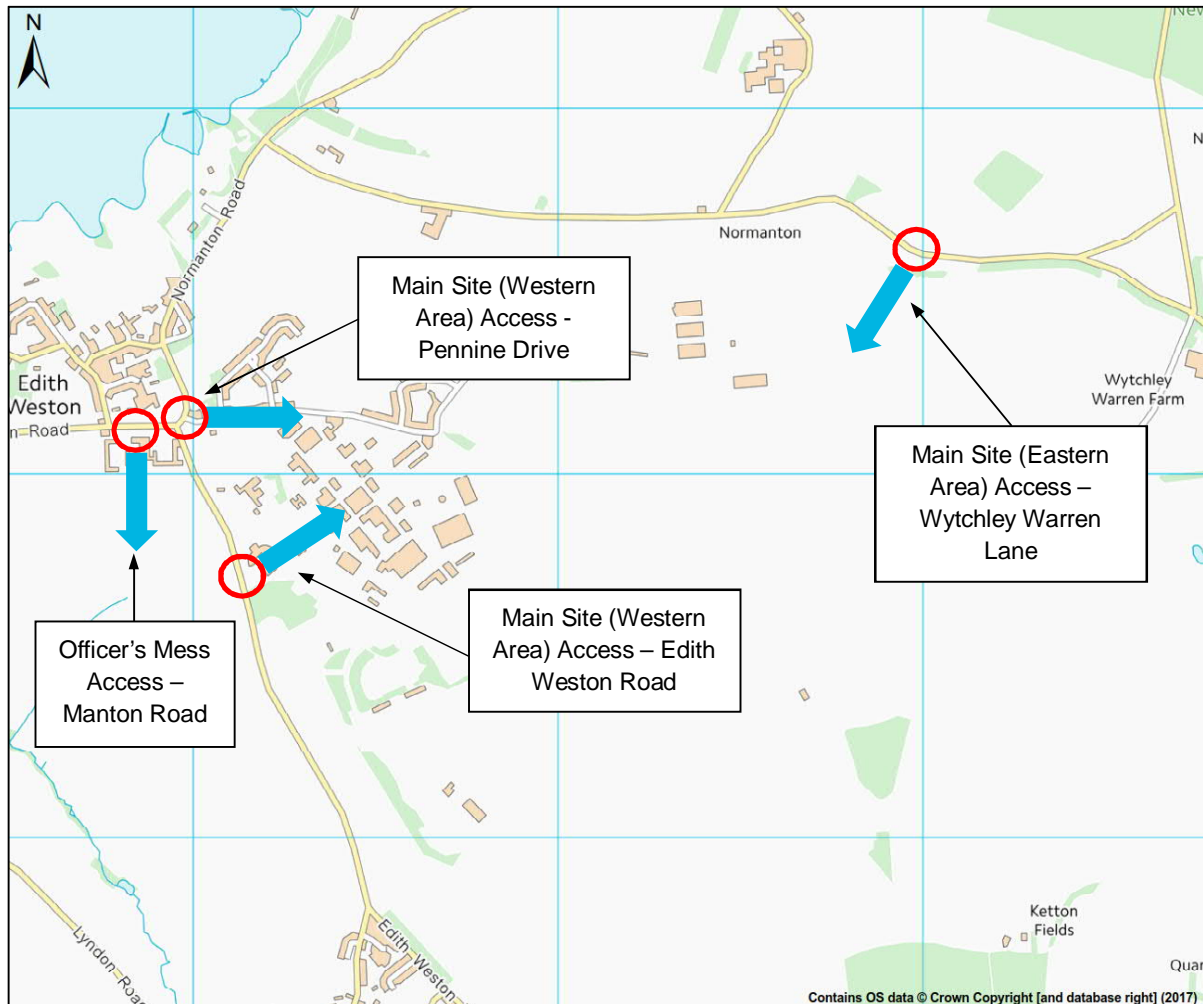
As part of the development of the site masterplan, various internal link roads would be required to provide connectivity between the site areas.

The proposed access locations are shown in Figure 12.

5.5 Proposed Access – Main Site (Eastern Area)

For the Eastern Area an additional access is proposed from Wytchley Warren Lane. The proposed access locations are shown in Figure 12.

Figure 12: Proposed Site Accesses



6. Trip Generation & Distribution

6.1 Introduction

This section outlines the anticipated generation of vehicle trips as a consequence of the proposed development.

In order to produce a high level assessment of the traffic impacts related to development an exercise has been undertaken to establish potential vehicle trip rates and generation, based on the site quantum referred to in section 5.

In order to establish vehicle trip generation for the development, industry standard software TRICS has been used to obtain the likely trip rates for indicative weekday morning and evening peak hours (08.00-09.00 and 17.00-18.00) using site specific land uses as detailed below. The TRICS data is provided within **Appendix C**.

It should be noted that the trip generations are a worst case scenario, based on current projections of traffic. In reality, changing patterns of movement, more people working from home, internalisation of trips due to land use mix, emerging technology etc. will potentially result in lower traffic than expected for the periods long into the future. Further refinement of trip rates will be undertaken as the masterplan develops.

6.2 Trip Rates

Trip rates for residential and employment uses have been obtained from the TRICS database for the proposed development.

The trip rates, as shown in Table 12, will be used in assessment.

Table 12: Trip Rates (TRICS)

Land Use	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Residential (C3 Dwellings)	0.144	0.371	0.365	0.217
B1 Office	1.387	0.223	0.165	1.180
B2 Light Industrial	0.458	0.084	0.047	0.388
B8 Warehousing	0.265	0.080	0.088	0.240

6.3 Trip Generation

For the purposes of the assessment three assessment years aligning with the end of key periods of development build out have been defined. An assessment year of 2025 includes the cumulative traffic of the Officers Mess development, around half of the 3,000 residential units all of the 5 Ha employment land use and some of the 7.7 Ha employment land use. The assessment year of 2032 assesses the whole of the Western Area with the exception of 1.3 Hectares of employment use. The assessment year of 2041 assesses the impact of the whole masterplan including the 500 residential units in the Eastern Area and the residual 1.3 Ha employment land use in the Western Area.

The assessment years are explained in more detail in Section 7.

The resultant total trip generations in the chosen assessment years are shown in Table 13.

Table 13: Assessment Years Trip Generation (Total Vehicles)

Assessment Year	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
2025	407	513	920	496	468	964
2032	792	1,205	1,997	1,172	966	2,138
2041	897	1,397	2,293	1,359	1,103	2,462

The trip generations indicate that by 2041, the completed development is predicted to generated 2,293 total trips in the AM Peak and 2,462 trips in the PM peak. The year by year trip accumulation spreadsheet is also included at **Appendix B**.

6.4 Trip Distribution

This section outlines how the proposed vehicle trips would distribute onto the local road network as part of the assessment.

Vehicular trips have been distributed according to the 2011 Census Travel to Work dataset. This dataset combines the details of where people live and work, based on Census output areas, which for the purposes of a traffic and transport assessment can be used to derive a development trip distribution.

The location of usual residence has been based on the Rutland Lower Super Output Areas (LSOA) within which the site is located, and the place of work has been determined using larger Middle Layer Super Output Areas (MSOA).

This dataset provides a robust distribution of traffic travelling for employment purposes, and can also be used to indicate the distribution of people travelling to and from residential areas.

Table 14 indicates the location of where trips are likely to travel to from the development site accesses.

Table 14: Journey Destinations – MSOA Level Distribution

Middle Super Output Area	Distribution Percentage
Rutland	50%
Leicester	3%
Blaby	2%
Harborough	2%
Hinckley and Bosworth	1%
Melton	4%
South Holland	1%
South Kesteven	12%
Corby	3%
Daventry	1%
East Northamptonshire	2%
Kettering	2%
Birmingham	1%
Peterborough	14%
Fenland	1%
Huntingdonshire	2%

The above provides a realistic distribution of trips to MSOA level areas. The table shows that 50% of residents are likely to work within Rutland itself; as such, Rutland has been broken down further to its LSOA levels in order to allow for a more accurate local distribution.

The table below details the 50% of Rutland trips distributed between the LSOAs within the Rutland area.

Table 15: Journey Destinations within Rutland

Rutland Lower Super Output Area	Location	Distribution Percentage Total Rutland = 50%
E01013788 : Rutland 001A	Cottesmore	3%
E01013789 : Rutland 001B	Upper Hambleton	2%
E01013790 : Rutland 001C	Stretton	3%
E01013793 : Rutland 002A	Langham	1%
E01013800 : Rutland 002B	Oakham	0%
E01013801 : Rutland 002C	Barleythrope	7%
E01013809 : Rutland 002D	Whissendine	0%
E01013798 : Rutland 003A	Oakham	1%
E01013799 : Rutland 003B	Oakham	7%
E01013802 : Rutland 003C	Oakham	4%
E01013803 : Rutland 003D	Oakham	0%
E01013791 : Rutland 004A	Stamford	3%
E01013792 : Rutland 004B	Ketton	1%
E01013805 : Rutland 004E	Little Casterton	1%
E01013787 : Rutland 005A	Belton in Rutland	0%
E01013794 : Rutland 005B	Uppingham	1%
E01013795 : Rutland 005C	Manton	2%
E01013806 : Rutland 005D	Uppingham	1%
E01013807 : Rutland 005E	Uppingham	11%
E01013808 : Rutland 005F	Uppingham	0%

Based on the distribution detailed within this section, trips associated with the Officer's Mess area have been distributed accordingly to / from the proposed entrance located on Manton Road and trips to / from the Western Area have been distributed equally between the Edith Weston Road access and Penning Drive access. Trips to / from the Eastern Area have been distributed to / from the access on Wythchley Warren Lane.

Route planning software has been utilised to determine the quickest route from the site to the strategic road network, which shows that vehicles wishing to travel south to Uppingham, Corby or Kettering along the A6003 would find it quicker to use Manton Road / Lyndon Road than travelling through North Luffenham and South Luffenham to reach the A47.

Based on the above, traffic flow diagrams detailing the distribution and associated development trips for each of the proposed land uses are provided at **Appendix D**.

7. Traffic Impact Assessment Scope

7.1 Introduction

This section provides details of the assessment scope used to inform the junction assessments undertaken as part of the study.

7.2 Base Traffic

In order to assess the potential traffic implications of the proposed sites, details of existing traffic movements on the surrounding road network were required. Classified traffic counts and automated traffic counts were undertaken at key junctions and on key road links on the surrounding road network. The classified counts were undertaken on Thursday 5th October 2017, with the automated counts collected over a period of one week between 5th and 11th October 2017.

7.3 Assessment Scenarios

The scenarios that have been applied to the operational assessments are as follows:

- 2025 Base Traffic;
- 2025 Base + Development Traffic;
- 2032 Base Traffic;
- 2032 Base + Development Traffic;
- 2041 Base Traffic; and
- 2041 Base + Development Traffic.

7.4 Assessment Hours

The peak hours identified from the traffic surveys are 08.00 to 09.00 in the AM and 17.00 to 18.00 in the PM. These periods have subsequently been used for assessment within this study.

7.5 Traffic Growth and Other Development

In order to provide a robust overview of the future base traffic likely to be present on the road network, a number of assumptions have been made. These account for the background increases in traffic flows and increases related to expected development implementation.

The traffic growth used as part of the assessment has been derived as follows.

7.5.1 TEMPRO Growth

Traffic flows have been growthed using TEMPRO NTM growth factors for the 'Rutland 004' area for assessment years of 2025, 2032 and 2041. Within the software the selected area chosen was 'rural' and 'all' was selected as the road type.

The growth factors applied to the 2017 surveyed flows for the AM and PM peaks are as follows:

- 1.1185 – 2017 to 2025 weekday AM and PM growth (e.g. 11.9% traffic growth); and
- 1.1685 – 2017 to 2032 weekday AM and PM growth (e.g. 16.9% traffic growth).
- 1.2271 – 2017 to 2041 weekday AM and PM growth (e.g. 22.7% traffic growth).

These growth factors were deemed appropriate to cover growth locally. It is likely that this site will provide a large proportion of the traffic growth on local roads, so this methodology is considered robust.

7.5.2 Rutland Local Plan Traffic Model

In order to provide a further degree of robustness to the estimated traffic growth, the growth factors from TEMPRO were compared with results generated by the traffic model produced by AECOM to test the Rutland Local Plan allocations.

The traffic growth derived from TEMPRO compared well with the results from the model on the majority of road links under consideration as part of the assessment. There was one road link – the A606 north of Edith Weston – that showed considerably higher growth than estimated in TEMPRO. The base traffic flows on the A606 have subsequently been uplifted by a further 10% to take this into account.

8. Traffic Impact Assessment

8.1 Introduction

This section provides the results of the operational junction assessments carried out to assess the impacts additional traffic will have on the local road network and surrounding areas.

Additional traffic has been assigned to the local road network based on the distribution described in section 6 and resultant traffic flow diagrams have been produced to indicate this (see **Appendix D**).

8.2 Junction Assessments

A number of key local junctions have been assessed in order to understand the impact of the future development traffic. The junctions assessed are indicated as follows and shown in Figure 3:

- Junction 1: A6003 / Lyndon Road Junction;
- Junction 2: Edith Weston Road / Manton Road / Normanton Park Road Junction;
- Junction 3: Normanton Park Road / Wytchley Warren Lane;
- Junction 4: Station Road / A6121;
- Junction 5: Station Road / A47;
- Junction 6: A606 / Normanton Park Road Junction;
- Junction 7: A6121 / Empingham Road;
- Junction 8: Existing Barracks Access, Edith Weston Road;
- Junction 9: Pennine Drive / Normanton Road; and
- Junction 10: A606 / A1.

The modelling software package Junctions 9 has been used to assess the operation of all the above junctions. The Junctions 9 software uses Ratio to Flow Capacity (RFC) to measure the capacity of the junction. RFC values of 0.85 or less are considered to indicate the junction is operating sufficiently, values of 0.85 – 1.0 indicate that some queuing and delay is starting to occur, and values above 1.0 are considered to represent a condition whereby further extended delay and queuing is predicted to occur.

All associated traffic flow diagrams associated within the assessments are included in **Appendix D**, with all modelling outputs for the assessment provided in **Appendix E**.

8.2.1 Junction 1(A): A6003 / Lyndon Road Junction (Eastern Portion – Crossroads)

Junction 1 has been assessed within three separate models, as the junction essentially operates as two priority junctions and a crossroads. If one element of the junction fails to operate satisfactorily, the junction as a whole is considered to fail.

The elements of the junctions have been designated as the Eastern Portion (crossroads), Western Portion (priority) and Southern Portion (priority). The layout of the junction is shown in Figure 13.

The results of the assessments are summarised below, with full outputs provided in **Appendix E**.

Figure 13: Junction 1 Layout

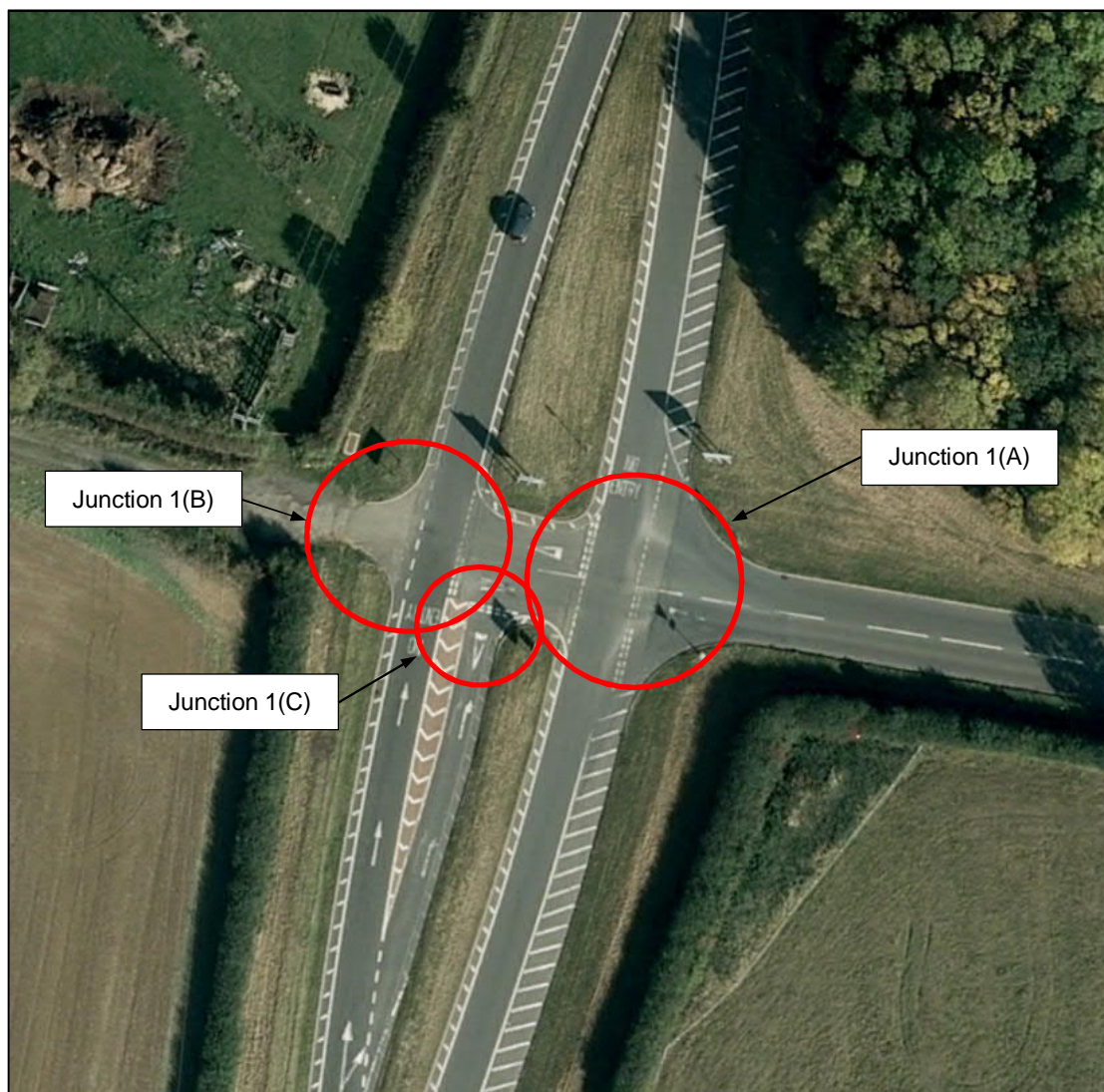


Table 16: Junction 1(A) - 2025 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (South) & Lyndon Road (Central Island)	0.28	0	0.27	0
Lyndon Road to A6003 (North) & Lyndon Road (Central Island)	0.17	0	0.16	0
Lyndon Road (Central Island) to A6003 (North) & A6003 (South)	0.17	0	0.18	0

Table 17: Junction 1(A) - 2025 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (South) & Lyndon Road (Central Island)	0.82	4	0.74	3
Lyndon Road to A6003 (North) & Lyndon Road (Central Island)	0.60	1	0.46	1
Lyndon Road (Central Island) to A6003 (North) & A6003 (South)	0.40	1	0.46	1

Table 18: Junction 1(A) - 2032 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (South) & Lyndon Road (Central Island)	0.30	0	0.29	0
Lyndon Road to A6003 (North) & Lyndon Road (Central Island)	0.18	0	0.17	0
Lyndon Road (Central Island) to A6003 (North) & A6003 (South)	0.17	0	0.19	0

Table 19: Junction 1(A) - 2032 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (South) & Lyndon Road (Central Island)	1.89	239	1.48	111
Lyndon Road to A6003 (North) & Lyndon Road (Central Island)	1.88	94	1.45	45
Lyndon Road (Central Island) to A6003 (North) & A6003 (South)	0.66	2	0.92	8

Table 20: Junction 1(A) - 2041 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (South) & Lyndon Road (Central Island)	0.32	0	0.31	0
Lyndon Road to A6003 (North) & Lyndon Road (Central Island)	0.19	0	0.18	0
Lyndon Road (Central Island) to A6003 (North) & A6003 (South)	0.18	0	0.20	0

Table 21: Junction 1(A) - 2041 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (South) & Lyndon Road (Central Island)	2.18	353	1.77	198
Lyndon Road to A6003 (North) & Lyndon Road (Central Island)	2.17	139	1.76	79
Lyndon Road (Central Island) to A6003 (North) & A6003 (South)	0.75	3	1.06	24

Results indicate that this portion of the junction is predicted to operate satisfactorily without the addition of development traffic in all assessment years.

With the development traffic added this part of the junction would operate satisfactorily in 2025 with the development traffic added, however by 2032 it would be operating significantly over capacity.

It is considered that re-modelling of this junction would be required at some point between 2025 and 2032 to ensure it can manage the additional development traffic during the later stages of the development.

Further details of the mitigation proposed for this junction are included within section 9, which also includes additional assessment of the re-modelled junction.

8.2.2 Junction 1(B): A6003 / Lyndon Road Junction (Western Portion - Priority)

The results of the assessments of the western portion of the junction are summarised below, with full outputs provided in **Appendix E**.

Table 22: Junction 1(B) - 2025 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (North) & A6003 (South)	0.28	0	0.27	0

Table 23: Junction 1(B) - 2025 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (North) & A6003 (South)	0.57	1	0.53	1

Table 24: Junction 1(B) - 2032 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (North) & A6003 (South)	0.29	0	0.28	0

Table 25: Junction 1(B) - 2032 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (North) & A6003 (South)	0.98	13	0.82	4

Table 26: Junction 1(B) - 2041 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (North) & A6003 (South)	0.31	0	0.30	0

Table 27: Junction 1(B) - 2041 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road to A6003 (North) & A6003 (South)	1.11	37	0.91	8

Results indicate that this portion of the junction is predicted to operate satisfactorily without the addition of development traffic in all assessment years.

With the development traffic added this part of the junction would operate satisfactorily in 2025. However, by 2032 it would be operating at capacity.

This provides further evidence that re-modelling of this junction would be required at some point between 2025 and 2032 to ensure it can manage the additional development traffic during the later stages of the development.

Further details of the mitigation proposed for this junction are included within section 9, which also includes additional assessment of the re-modelled junction.

8.2.3 Junction 1(C): A6003 / Lyndon Road Junction (Southern Portion - Priority)

The results of the assessments of the southern portion of the junction are summarised below, with full outputs provided in **Appendix E**.

Table 28: Junction 1(C) - 2025 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6003 Right Turn Lane to Lyndon Road (East)	0.16	0	0.18	0

Table 29: Junction 1(C) - 2025 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6003 Right Turn Lane to Lyndon Road (East)	0.41	1	0.48	1

Table 30: Junction 1(C) - 2032 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6003 Right Turn Lane to Lyndon Road (East)	0.17	0	0.19	0

Table 31: Junction 1(C) - 2032 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6003 Right Turn Lane to Lyndon Road (East)	0.71	2	0.94	9

Table 32: Junction 1(C) - 2041 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6003 Right Turn Lane to Lyndon Road (East)	0.18	0	0.20	0

Table 33: Junction 1(C) - 2041 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6003 Right Turn Lane to Lyndon Road (East)	0.81	4	1.08	27

Results indicate that this portion of the junction is predicted to operate satisfactorily without the addition of development traffic in all assessment years.

With the development traffic added this part of the junction would operate satisfactorily in 2025. However, by 2032 it would be operating close to capacity.

This provides further evidence that re-modelling of this junction would be required at some point between 2025 and 2032 to ensure it can manage the additional development traffic during the later stages of the development.

Further details of the mitigation proposed for this junction are included within section 9, which also includes additional assessment of the re-modelled junction.

8.2.4 Junction 2: Edith Weston Road / Manton Road / Normanton Park Road Roundabout

The results of the roundabout assessments are summarised below, with full outputs provided in **Appendix E**.

Table 34: Junction 2 - 2025 Base Traffic Results

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Road	0.15	0	0.11	0
Edith Weston Road	0.13	0	0.15	0
Manton Road	0.14	0	0.12	0

Table 35: Junction 2 - 2025 Base Traffic With Development

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Road	0.36	1	0.32	1
Edith Weston Road	0.38	1	0.39	1
Manton Road	0.33	1	0.34	1

Table 36: Junction 2 - 2032 Base Traffic Results

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Road	0.15	0	0.12	0
Edith Weston Road	0.14	0	0.15	0
Manton Road	0.14	0	0.13	0

Table 37: Junction 2 - 2032 Base Traffic With Development

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Road	0.67	2	0.64	2
Edith Weston Road	0.78	3	0.70	2
Manton Road	0.54	1	0.69	2

Table 38: Junction 2 - 2041 Base Traffic Results

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Road	0.16	0	0.12	0
Edith Weston Road	0.14	0	0.16	0
Manton Road	0.15	0	0.13	0

Table 39: Junction 2 - 2041 Base Traffic With Development

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Road	0.79	4	0.72	3
Edith Weston Road	0.85	5	0.75	3
Manton Road	0.60	2	0.79	4

Results indicate that the junction is predicted to operate well under capacity in all assessment years without the development traffic.

The junction is also expected to operate under capacity with the development traffic in 2025 and 2035. However, by 2041 the junction would be approaching capacity.

Whilst results show that the junction would not operate over capacity, due to the close proximity of the junction to the proposed site and the fact that a large proportion of development trips would likely flow through the junction, it is recommended that junction improvements would be required between 2025 and 2032

Further details of the mitigation proposed for this junction are included within section 9.

8.2.5 Junction 3: Normanton Park Road / Wytchley Warren Lane

The results of the junction assessments are summarised below, with full outputs provided in **Appendix E**.

Table 40: Junction 3 - 2025 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Wytchley Warren Lane to Normanton Park Road (South)	0.02	0	0.02	0
Normanton Park Road (South) to Normanton Park Road (North) & Wytchley Warren Lane	0.02	0	0.02	0

Table 41: Junction 3 - 2025 Base Traffic With Development Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Wytchley Warren Lane to Normanton Park Road (South)	0.02	0	0.02	0
Wytchley Warren Lane to Normanton Park Road (North)	0.00	0	0.01	0
Normanton Park Road (South) to Normanton Park Road (North) & Wytchley Warren Lane	0.03	0	0.03	0

Table 42: Junction 3 - 2032 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Wytchley Warren Lane to Normanton Park Road (South)	0.02	0	0.02	0
Normanton Park Road (South) to Normanton Park Road (North) & Wytchley Warren Lane	0.02	0	0.02	0

Table 43: Junction 3 - 2032 Base Traffic With Development Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Wytchley Warren Lane to Normanton Park Road (South)	0.03	0	0.03	0
Wytchley Warren Lane to Normanton Park Road (North)	0.00	0	0.01	0
Normanton Park Road (South) to Normanton Park Road (North) & Wytchley Warren Lane	0.05	0	0.04	0

Table 44: Junction 3 - 2041 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Wytchley Warren Lane to Normanton Park Road (South)	0.02	0	0.02	0
Wytchley Warren Lane to Normanton Park Road (North)	0.00	0	0.01	0
Normanton Park Road (South) to Normanton Park Road (North) & Wytchley Warren Lane	0.03	0	0.02	0

Table 45: Junction 3 - 2041 Base Traffic With Development Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Wytchley Warren Lane to Normanton Park Road (South)	0.22	0	0.15	0
Wytchley Warren Lane to Normanton Park Road (North)	0.13	0	0.09	0
Normanton Park Road (South) to Normanton Park Road (North) & Wytchley Warren Lane	0.15	0	0.32	1

Results indicate that the junction is predicted to operate well under capacity in all assessment years with and without the development traffic.

It is considered that based on these results, no junction re-modelling would be required to facilitate the additional development traffic.

8.2.6 Junction 4: Station Road / A6121 Roundabout

The results of the roundabout assessments are summarised below, with full outputs provided in **Appendix E**.

Table 46: Junction 4 - 2025 Base Traffic Results

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6121 (North East)	0.17	0	0.16	0
Station Road (South East)	0.06	0	0.11	0
A6121 (South West)	0.22	0	0.18	0
Station Road (North West)	0.11	0	0.08	0

Table 47: Junction 4 - 2025 Base Traffic With Development

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6121 (North East)	0.19	0	0.17	0
Station Road (South East)	0.15	0	0.22	0
A6121 (South West)	0.23	0	0.19	0
Station Road (North West)	0.23	0	0.19	0

Table 48: Junction 4 - 2032 Base Traffic Results

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6121 (North East)	0.18	0	0.17	0
Station Road (South East)	0.06	0	0.11	0
A6121 (South West)	0.23	0	0.19	0
Station Road (North West)	0.12	0	0.09	0

Table 49: Junction 4 - 2032 Base Traffic With Development

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6121 (North East)	0.22	0	0.19	0
Station Road (South East)	0.25	0	0.38	1
A6121 (South West)	0.25	0	0.22	0
Station Road (North West)	0.40	1	0.32	1

Table 50: Junction 4 - 2041 Base Traffic Results

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6121 (North East)	0.19	0	0.17	0
Station Road (South East)	0.07	0	0.12	0
A6121 (South West)	0.24	0	0.20	0
Station Road (North West)	0.13	0	0.09	0

Table 51: Junction 4 – 2041 Base Traffic With Development

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A6121 (North East)	0.23	0	0.20	0

Station Road (South East)	0.26	0	0.40	1
A6121 (South West)	0.27	0	0.23	0
Station Road (North West)	0.42	1	0.33	1

Results indicate that the junction is predicted to operate under capacity during all assessment years with and without the development traffic.

It is considered that based on these results, no junction re-modelling would be required to facilitate the development traffic.

8.2.7 Junction 5: Station Road / A47 Junction

The results of the junction assessments are summarised below, with full outputs provided in **Appendix E**.

Table 52: Junction 5 - 2025 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Station Road to A47 (West) & A47 (East)	0.20	0	0.14	0
A47 (East) to A47 (West) & Station Road	0.18	0	0.22	0

Table 53: Junction 5 - 2025 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Station Road to A47 (West) & A47 (East)	0.46	1	0.36	1
A47 (East) to A47 (West) & Station Road	0.42	1	0.52	2

Table 54: Junction 5 - 2032 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Station Road to A47 (West) & A47 (East)	0.21	0	0.15	0
A47 (East) to A47 (West) & Station Road	0.19	0	0.23	0

Table 55: Junction 5 - 2032 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Station Road to A47 (West) & A47 (East)	0.83	4	0.60	2
A47 (East) to A47 (West) & Station Road	0.67	3	0.96	17

Table 56: Junction 5 - 2041 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Station Road to A47 (West) & A47 (East)	0.22	0	0.16	0
A47 (East) to A47 (West) & Station Road	0.21	0	0.25	0

Table 57: Junction 5 - 2041 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Station Road to A47 (West) & A47 (East)	0.87	6	0.63	2
A47 (East) to A47 (West) & Station Road	0.73	4	1.00	27

Results indicate that junction is predicted to operate satisfactorily in all assessment years without the addition of the development traffic.

With the development traffic added, the junction would operate close to capacity in 2032 and be over capacity by 2041. It is considered that re-modelling of this junction would be required after 2032 to ensure it can manage the additional traffic attributed to later stages of the development.

Further details of the mitigation proposed for this junction are included within section 9, which also includes additional assessment of the re-modelled junction.

8.2.8 Junction 6: A606 / Normanton Park Road Junction

The results of the junction assessments are summarised below, with full outputs provided in **Appendix E**.

Table 58: Junction 6 - 2025 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Park Road to A606 (West)	0.01	0	0.02	0
Normanton Park Road to A606 (East)	0.28	0	0.29	0
A606 (West) to A606 (East) & Normanton Park Road	0.19	0	0.20	0

Table 59: Junction 6 - 2025 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Park Road to A606 (West)	0.23	0	0.22	0
Normanton Park Road to A606 (East)	0.46	1	0.44	1
A606 (West) to A606 (East) & Normanton Park Road	0.34	0	0.38	0

Table 60: Junction 6 – 2032 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Park Road to A606 (West)	0.01	0	0.02	0
Normanton Park Road to A606 (East)	0.31	0	0.32	1
A606 (West) to A606 (East) & Normanton Park Road	0.20	0	0.21	0

Table 61: Junction 6 - 2032 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Park Road to A606 (West)	0.96	7	0.70	2
Normanton Park Road to A606 (East)	0.92	6	0.83	4
A606 (West) to A606 (East) & Normanton Park Road	0.50	1	0.65	2

Table 62: Junction 6 – 2041 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Park Road to A606 (West)	0.02	0	0.02	0
Normanton Park Road to A606 (East)	0.34	1	0.35	1
A606 (West) to A606 (East) & Normanton Park Road	0.21	0	0.22	0

Table 63: Junction 6 - 2041 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Normanton Park Road to A606 (West)	1.13	22	1.07	15
Normanton Park Road to A606 (East)	1.11	14	1.06	11
A606 (West) to A606 (East) & Normanton Park Road	0.57	1	0.75	3

Results indicate that the junction is predicted to operate well under capacity in all assessment years without development traffic.

With the development traffic added, the junction would start to operate close to capacity in 2032 and be over capacity by 2041. It is considered that re-modelling of this junction would be required after 2032 to ensure it can manage the additional traffic attributed to later stages of the development.

8.2.9 Junction 7: A6121 / Empingham Road Junction

The results of the junction assessments are summarised below, with full outputs provided in **Appendix E**.

Table 64: Junction 7 - 2025 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Church Road to A6121 (South West) & Empingham Road	0.08	0	0.09	0
Church Road to A6121 (North East) & Empingham Road	0.24	0	0.23	0
A6121 (North East) to All Arms	0.08	0	0.15	0
Empingham Road to All Arms	0.23	0	0.16	0
A6121 (South West) to All Arms	0.04	0	0.06	0

Table 65: Junction 7 - 2025 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Church Road to A6121 (South West) & Empingham Road	0.08	0	0.09	0
Church Road to A6121 (North East) & Empingham Road	0.24	0	0.23	0
A6121 (North East) to All Arms	0.08	0	0.15	0
Empingham Road to All Arms	0.23	0	0.16	0
A6121 (South West) to All Arms	0.04	0	0.06	0

Table 66: Junction 7 - 2032 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Church Road to A6121 (South West) & Empingham Road	0.09	0	0.09	0
Church Road to A6121 (North East) & Empingham Road	0.25	0	0.24	0
A6121 (North East) to All Arms	0.09	0	0.16	0
Empingham Road to All Arms	0.24	0	0.17	0
A6121 (South West) to All Arms	0.04	0	0.06	0

Table 67: Junction 7 - 2032 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Church Road to A6121 (South West) & Empingham Road	0.09	0	0.10	0
Church Road to A6121 (North East) & Empingham Road	0.25	0	0.24	0
A6121 (North East) to All Arms	0.09	0	0.17	0
Empingham Road to All Arms	0.25	0	0.17	0
A6121 (South West) to All Arms	0.04	0	0.06	0

Table 68: Junction 7 - 2041 Base Traffic Results

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Church Road to A6121 (South West) & Empingham Road	0.10	0	0.10	0
Church Road to A6121 (North East) & Empingham Road	0.27	0	0.26	0
A6121 (North East) to All Arms	0.09	0	0.17	0
Empingham Road to All Arms	0.26	0	0.18	0
A6121 (South West) to All Arms	0.04	0	0.07	0

Table 69: Junction 7 - 2041 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Church Road to A6121 (South West) & Empingham Road	0.12	0	0.18	0
Church Road to A6121 (North East) & Empingham Road	0.30	0	0.32	1
A6121 (North East) to All Arms	0.11	0	0.21	0
Empingham Road to All Arms	0.42	1	0.28	0
A6121 (South West) to All Arms	0.04	0	0.07	0

Results indicate that the junction is predicted to operate satisfactorily in all assessment years with and without the development traffic.

It is considered that based on these results, no junction re-modelling would be required to facilitate the development traffic.

8.2.10 Junction 8: St Georges Barracks Existing Site Access, Edith Weston Road

The results of the junction assessments are summarised below, with full outputs provided in **Appendix E**. Note that only the scenarios that include the additional development trips have been assessed. The site access junction, which currently serves the Barracks, operates well under capacity at present.

Table 70: Junction 8 - 2025 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Site Access to Edith Weston Road (South)	0.19	0	0.16	46
Site Access to Edith Weston Road (North)	0.55	1	0.50	1
Edith Weston Road (South) to Edith Weston Road (North) & Site Access	0.14	0	0.15	0

Table 71: Junction 8 - 2032 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Site Access to Edith Weston Road (South)	1.81	75	1.23	21
Site Access to Edith Weston Road (North)	1.83	209	1.26	57
Edith Weston Road (South) to Edith Weston Road (North) & Site Access	0.35	1	0.38	1

Table 72: Junction 8 - 2041 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Site Access to Edith Weston Road (South)	1.87	80	1.28	25
Site Access to Edith Weston Road (North)	1.88	221	1.31	67
Edith Weston Road (South) to Edith Weston Road (North) & Site Access	0.37	1	0.39	1

Results indicate that the junction is predicted to operate satisfactorily in 2025 with development trips included, but by 2032 would be operating well over capacity.

This is an indication that an additional access point into the site from Edith Weston Road would be needed to facilitate the additional development vehicle trips at some point between 2025 and 2032.

It is noted that the indicative masterplan provides for a number of access points from Edith Weston Road so it is considered that mitigation to address this concern is already incorporated into the site development plans.

8.2.11 Junction 9: Pennine Drive / Normanton Road

The results of the junction assessments are summarised below, with full outputs provided in **Appendix E**.

Table 73: Junction 9 - 2025 Base Traffic

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Pennine Drive to Normanton Road North and South	0.10	0	0.06	0
Normanton Road South to Normanton Road North and Pennine Drive	0.04	0	0.09	0

Table 74: Junction 9 - 2025 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Pennine Drive to Normanton Road North and South	0.48	1	0.42	1
Normanton Road South to Normanton Road North and Pennine Drive	0.32	1	0.43	1

Table 75: Junction 9 - 2032 Base Traffic

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Pennine Drive to Normanton Road North and South	0.10	0	0.06	0
Normanton Road South to Normanton Road North and Pennine Drive	0.04	0	0.09	0

Table 76: Junction 9 - 2032 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Pennine Drive to Normanton Road North and South	1.13	33	0.99	13
Normanton Road South to Normanton Road North and Pennine Drive	0.66	3	0.99	18

Table 77: Junction 9 - 2041 Base Traffic

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Pennine Drive to Normanton Road North and South	0.11	0	0.07	0
Normanton Road South to Normanton Road	0.04	0	0.10	0

North and Pennine Drive

Table 78: Junction 9 - 2041 Base Traffic With Development

Movement	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Pennine Drive to Normanton Road North and South	1.25	66	1.13	31
Normanton Road South to Normanton Road North and Pennine Drive	0.76	4	1.08	43

Results indicate that the junction is predicted to operate well under capacity in all assessment years without development traffic.

With the development traffic added, the junction would be operating over capacity by 2032. It is considered that re-modelling of this junction would be required between 2025 and 2032 to ensure it can manage the additional traffic attributed to later stages of the development.

8.2.12 Junction 10: A606 / A1 Junction

An appraisal of the impact of development traffic on the A606 / A1 approaching from the A606 (west) has been undertaken. The percentage impact of the development traffic has been assessed at the following locations at the junction and these are also shown in Figure 14.

- A: A1 North of Junction;
- B: A1 South of Junction;
- C: A606 East of Junction;
- D: A606 West of Junction;
- E: A1 Southbound Off / On Slip; and
- F: A1 Northbound Off / On Slip.

Figure 14: Junction 10 Appraisal Locations



The mainline and slip road flows on the A1 have been obtained from Highways England's WebTRIS traffic data source (for the same week in October 2017 as the other traffic counts), which have then been compared with the development flows in the 2025, 2032 and 2041 assessment years to indicate an overall percentage impact. The A1 flows have also been growthed up to the assessment years using the same expansion factors used for all other assessments. Flows on the A606 were obtained from the October 2017 traffic surveys and growthed accordingly.

The percentage impact of the two-way development flows on the total flow by assessment year at each location is shown in Table 79.

Table 79: Development Traffic Percentage Increase at the A606 / A1 Junction

Location	2025		2032		2041	
	AM	PM	AM	PM	AM	PM
A: A1 North of Junction	1%	1%	1%	1%	1%	1%
B: A1 South of Junction	1%	1%	1%	1%	1%	1%
C: A606 East of Junction	0%	0%	0%	0%	0%	0%
D: A606 West of Junction	4%	5%	8%	9%	8%	9%
E: A1 Southbound Off / On Slip	7%	5%	13%	10%	13%	10%
F: A1 Northbound Off / On Slip	2%	3%	4%	6%	4%	6%

The table indicates that the development traffic would be predicted to result in a generally small percentage increase in total traffic at all locations. The largest percentage increase is predicted on the A1 southbound off / on slip from 2032 onwards (13% in the AM peak and 10% in the PM peak).

8.3 Construction Traffic

As part of the construction of the development a number of construction vehicles and associated workers would likely be expected. With the construction of any development, it is important to note that any increases in vehicle movements will be temporary in nature.

For the expected scale of development it is estimated that typically 80 HGVs per day would travel in and out of the site to various sites within the masterplan area to deliver building materials, with approximately 200 workers travelling to and from the site.

The additional vehicle movements and any potential detrimental effects generated by a large scale construction would be managed within a Construction Traffic Management Plan (CTMP) and Travel Plan, which would be produced by contractors prior to the commencement of any construction activities.

An example of the measures that could be included within the CTMP are shown below:

- Allocated delivery times (e.g. avoiding peak traffic periods);
- Wheel washing facilities;
- Construction vehicle on-site management;
- Road signage; and
- Bespoke route planning for construction vehicles.

9. Proposed Mitigation

9.1 Introduction

This section outlines the proposed mitigation that could be introduced to reduce the impacts of the additional development traffic, based on the results of the junction modelling and provides an indication on when these improvements would be needed. Measures to enhance sustainable accessibility to the site have also been considered.

9.2 Junction Improvements

Based on the results of the junction modelling a summary of the junction improvements recommended along with an estimation of the period it would be needed is provided in Table 79. Further details of the improvements are then provided below, along with a re-assessment of the junction based on the proposed mitigation layout.

Table 80: Summary of Junction Improvements

Period	Improvements
2025-2032	J1 – A6003 / Lyndon Road junction upgraded to a roundabout
	J2 – Edith Weston Road / Manton Road junction improvement
	J8 – Additional access provision on Edith Weston Road
	J9 – Pennine Drive / Normanton Road junction improvements
2032-2041	J5 – A47 / Station Road junction upgraded to a roundabout
	J6 – A606 / Normanton Park Road upgraded to a roundabout

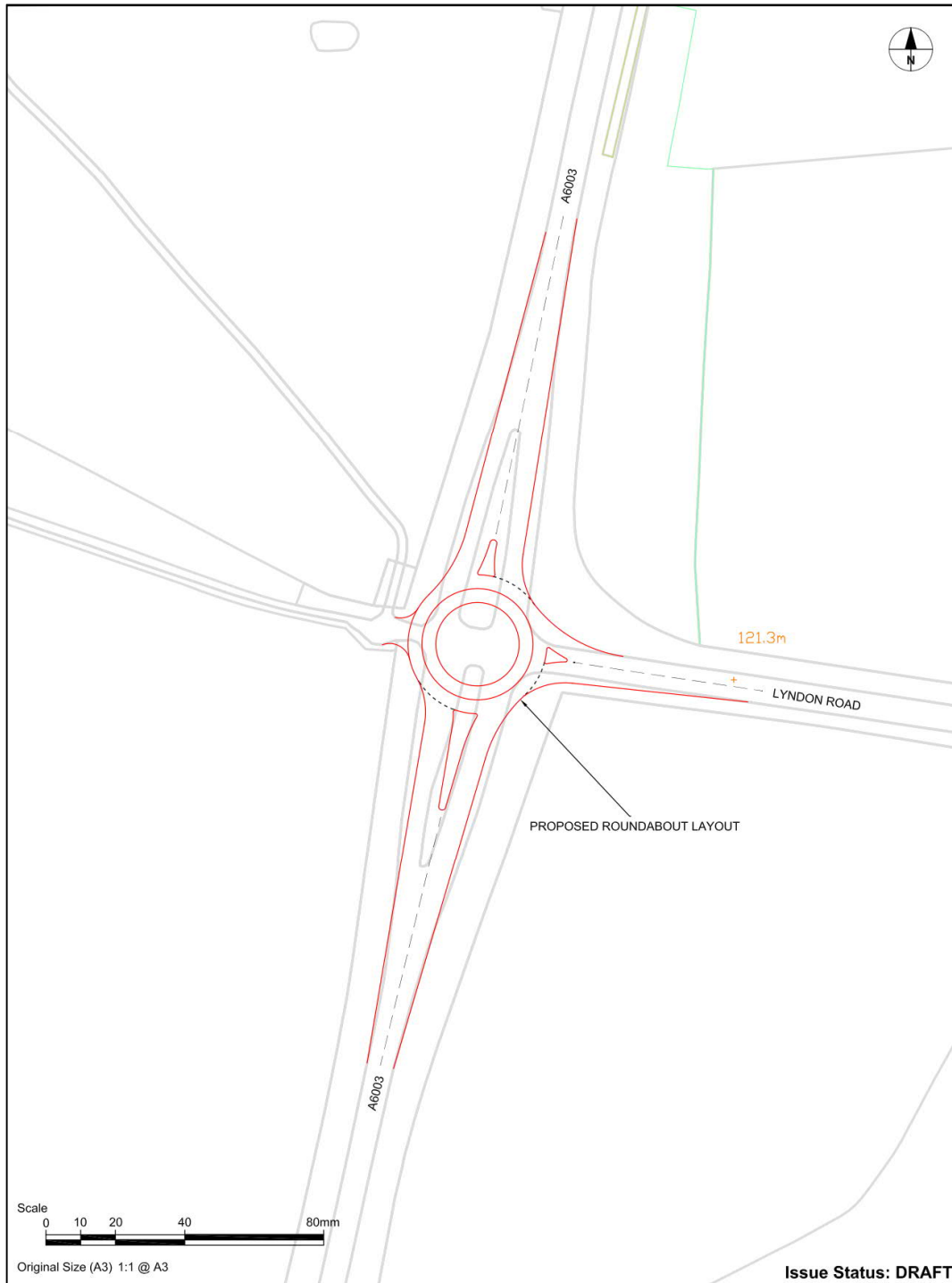
9.2.1 Junction 1: A6003 / Lyndon Road Junction Improvement

The existing junction layout would be altered to form a four-arm roundabout, with an additional arm for a farm access. The roundabout would be designed with the following parameters, in line with Design Manual for Roads and Bridges (DMRB) standards.

- Formation of a roundabout with an ICD of 40 metres;
- Two lane approach southbound on A6003;
- Two lane approach northbound on A6003; and
- Two lane approach westbound on Lyndon Road.

The outline roundabout design is shown in Figure 15 and provided in **Appendix A**.

Figure 15: Junction 1 - Roundabout Outline Design



Based on the above parameters, junction assessments have been re-run to assess the suitability of the proposed design. The modelling results are provided below:

Table 81: Junction 1 - 2025 Base Traffic With Development (Roundabout Design)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road	0.39	1	0.36	1
A6003 (North)	0.37	1	0.34	1
Farmer's Track	-	-	-	-
A6003 (South)	0.36	1	0.34	1

Table 82: Junction 1 - 2032 Base Traffic With Development (Roundabout Design)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road	0.71	2	0.58	1
A6003 (North)	0.47	1	0.47	1
Farmer's Track	-	-	-	-
A6003 (South)	0.44	1	0.47	1

Table 83: Junction 1 - 2041 Base Traffic With Development (Roundabout Design)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Lyndon Road	0.81	4	0.65	2
A6003 (North)	0.51	1	0.52	1
Farmer's Track	-	-	-	-
A6003 (South)	0.48	1	0.53	1

The results indicate that a roundabout designed to the specifications indicated would operate under capacity in all three assessment years with the inclusion of all development traffic.

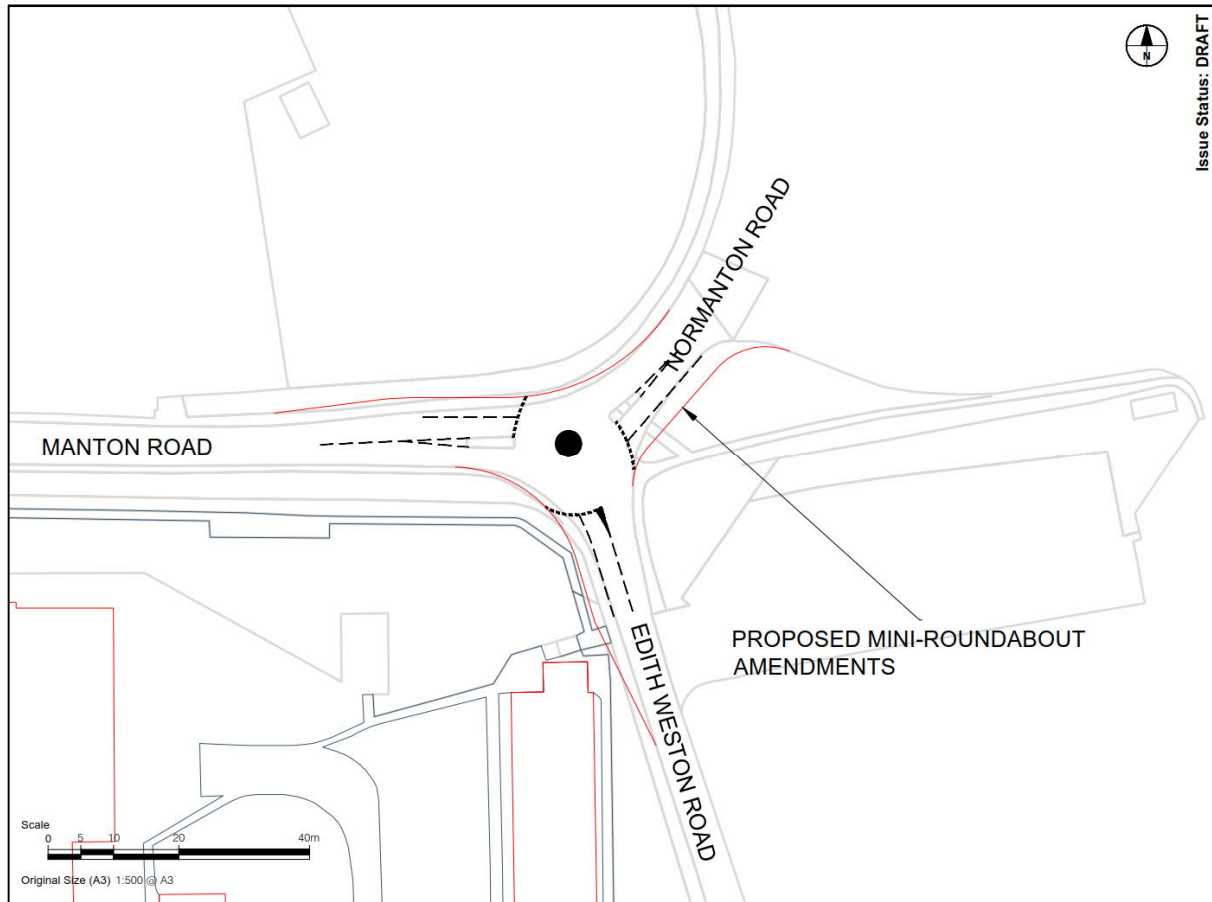
9.2.2 Junction 2: Edith Weston Road / Manton Road / Normanton Park Road Improvement

The existing junction layout would be altered based on the following parameters, in line with DMRB standards:

- An increased roundabout ICD to 25 metres;
- Two lane approach northbound along Edith Weston Road to accommodate a left turn lane; and
- Two lane approach eastbound along Manton Road to accommodate a right turn lane.

The roundabout design is shown in Figure 16 and provided in **Appendix A**.

Figure 16: Junction 2 - Roundabout Outline Design



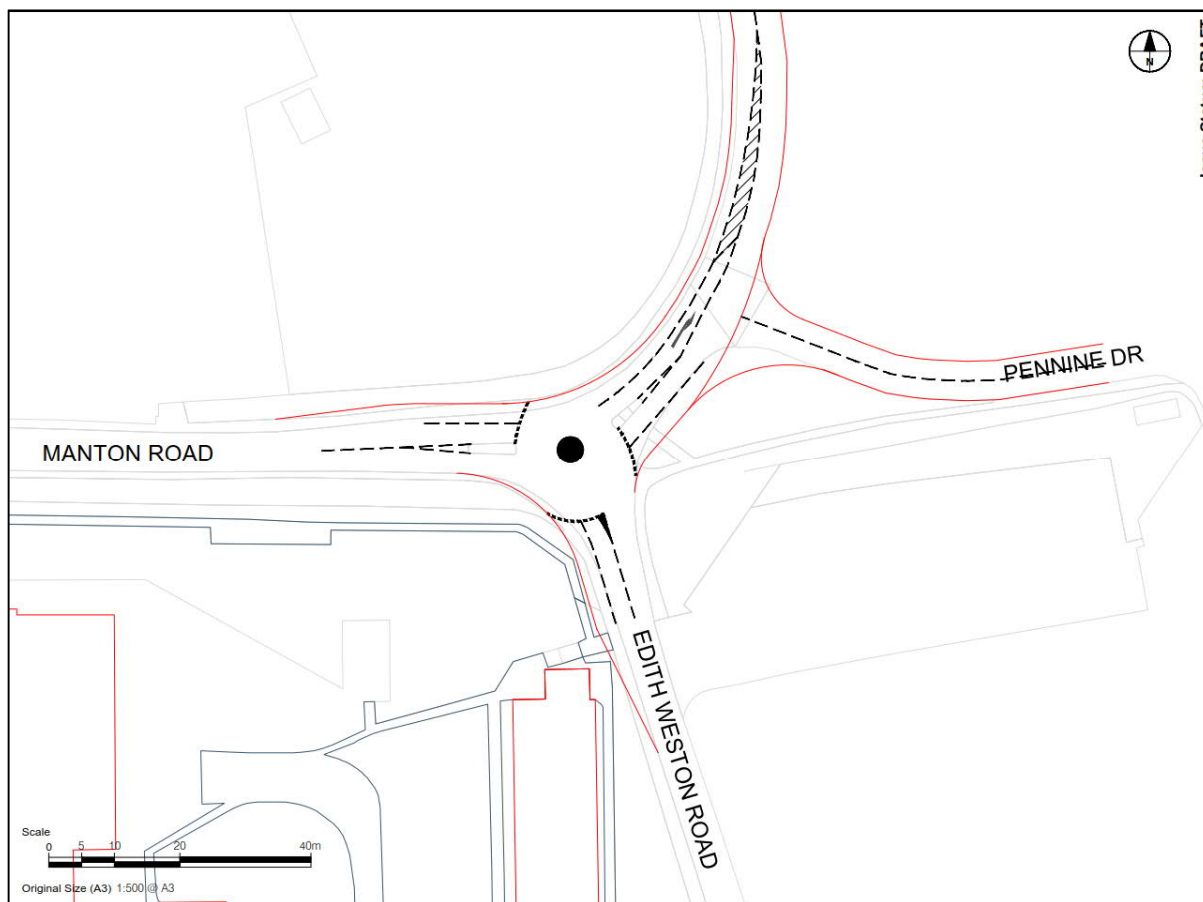
9.2.3 Junction 9: Pennine Drive / Normanton Road junction Improvement

The Pennine Drive / Normanton Road junction would remain as a priority junction but be improved based on the following parameters in line with DMRB standards.

- Widen Normanton Park Road (main road);
- Introduce a right turn lane on Normanton Park Road
- Widen the Pennine Drive arm entry width to facilitate more waiting space for vehicles

The layout design is shown in Figure 17 and provided in **Appendix A**. Note the Edith Weston Road / Manton Road improvements are also shown.

Figure 17: Junction 9 – Improved Junction Outline Design



Based on the above parameters, junction assessments have been re-run to assess the suitability. The modelling results are provided below:

Table 84: Junction 9 - 2025 Base Traffic With Development (Improved Junction)

Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Pennine Drive to Normanton Road South	0.33	1	0.27	0
Pennine Drive to Normanton Road North	0.17	0	0.17	0
Normanton Road South to Normanton Road North and Pennine Drive	0.28	0	0.37	1

Table 85: Junction 9 - 2032 Base Traffic With Development (Improved Junction)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Pennine Drive to Normanton Road South	0.79	3	0.61	2
Pennine Drive to Normanton Road North	0.52	1	0.45	1
Normanton Road South to Normanton Road North and Pennine Drive	0.53	1	0.84	5

Table 86: Junction 9 - 2041 Base Traffic With Development (Improved Junction)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Pennine Drive to Normanton Road South	0.86	5	0.67	2

Pennine Drive to Normanton Road North	0.65	2	0.53	1
Normanton Road South to Normanton Road North and Pennine Drive	0.58	1	0.87	6

The results indicate that a junction designed to the specifications indicated would operate under capacity in all assessment years with the inclusion of all development traffic.

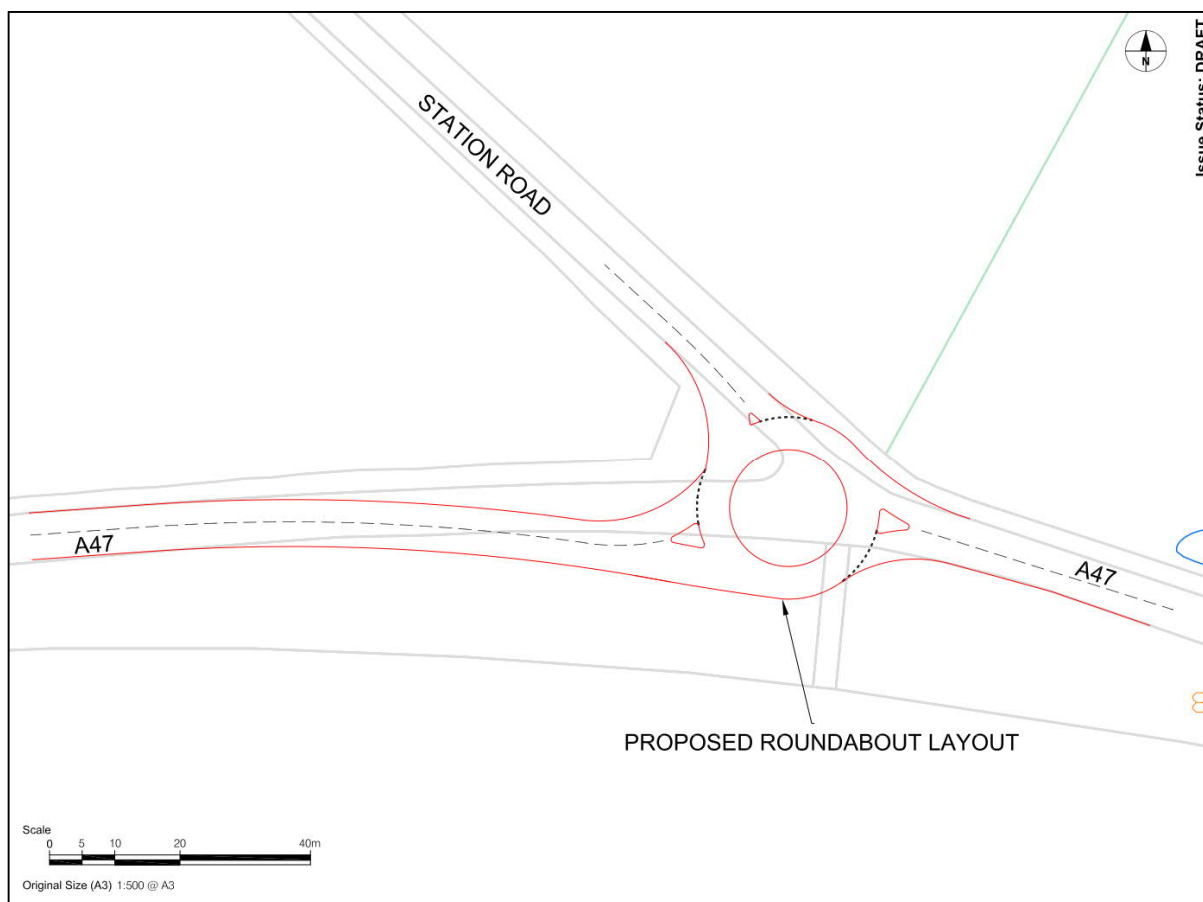
9.2.4 Junction 5: Station Road / A47 Junction Improvement

The existing junction layout would be altered to form a three-arm roundabout. The roundabout would be designed with the following parameters, in line with DMRB standards.

- Formation of a roundabout with an ICD of 28 metres;
- Two lane approach westbound on A47;
- Two lane approach eastbound on A47; and
- Two lane approach westbound on Station Road.

The roundabout design is shown in Figure 18 and provided in **Appendix A**.

Figure 18: Junction 5 - Roundabout Outline Design



Based on the above parameters, junction assessments have been re-run to assess the suitability. The modelling results are provided below:

Table 87: Junction 5 - 2025 Base Traffic With Development (Roundabout Design)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Station Road	0.25	0	0.18	0
A47 (East)	0.43	1	0.56	1
A47 (West)	0.51	1	0.30	0

Table 88: Junction 5 - 2032 Base Traffic With Development (Roundabout Design)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Station Road	0.44	1	0.31	0
A47 (East)	0.52	1	0.71	3
A47 (West)	0.56	1	0.35	1

Table 89: Junction 5 - 2041 Base Traffic With Development (Roundabout Design)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
Station Road	0.47	1	0.33	1
A47 (East)	0.55	1	0.74	3
A47 (West)	0.59	1	0.37	1

The results indicate that a roundabout designed to the specifications indicated would operate under capacity in all assessment years with the inclusion of all development traffic.

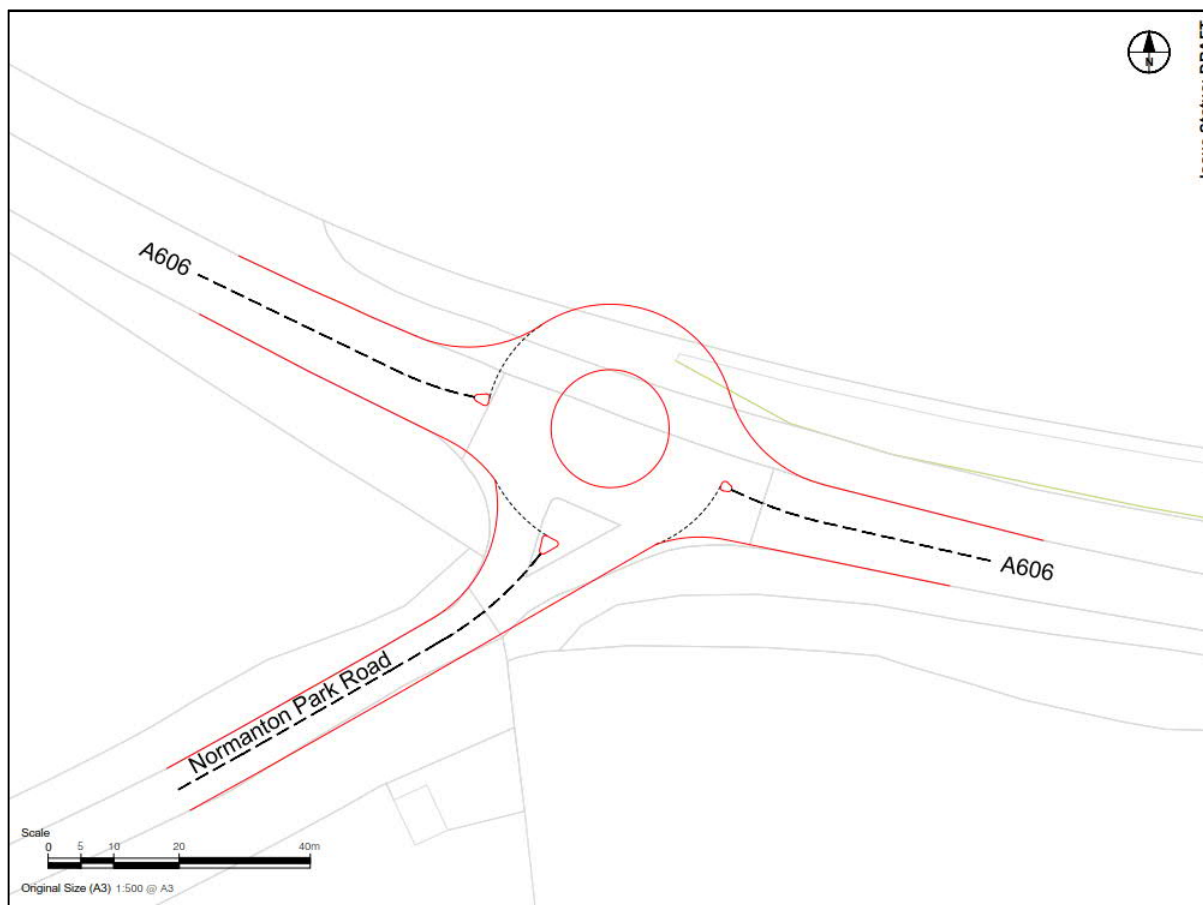
9.2.5 J6: A606 / Normanton Park Road Improvement

The existing junction layout would be altered to form a three-arm roundabout. The roundabout would be designed with the following parameters, in line with DMRB standards.

- Formation of a roundabout with an ICD of 38 metres;
- Two lane approach westbound on A606;
- Two lane approach eastbound on A606; and
- Two lane approach on Normanton Park Road.

The roundabout design is shown in Figure 18 and provided in **Appendix A**.

Figure 19: Junction 6 - Roundabout Outline Design



Based on the above parameters, junction assessments have been re-run to assess the suitability. The modelling results are provided below:

Table 90: Junction 6 - 2025 Base Traffic With Development (Roundabout Design)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A606 Eastern Arm	0.37	1	0.35	1
Normanton Park Road	0.20	0	0.19	0
A606 Western Arm	0.40	1	0.35	1

Table 91: Junction 6 - 2032 Base Traffic With Development (Roundabout Design)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A606 Eastern Arm	0.41	1	0.41	1
Normanton Park Road	0.36	1	0.31	1
A606 Western Arm	0.47	1	0.43	1

Table 92: Junction 6 - 2041 Base Traffic With Development (Roundabout Design)

Roundabout Arm	AM Peak		PM Peak	
	RFC	QUEUE	RFC	QUEUE
A606 Eastern Arm	0.44	1	0.43	1
Normanton Park Road	0.40	1	0.35	1
A606 Western Arm	0.50	1	0.47	1

The results indicate that a roundabout designed to the specifications indicated would operate under capacity in all assessment years with the inclusion of all development traffic.

9.2.6 Edith Weston Road Secondary Access

Based on the modelling results, it would be necessary to include a secondary access to the development on Edith Weston Road between 2025 and 3032. It is expected that this would help to relieve pressure on the single access into the south west of the development. It is noted that the indicative masterplan indicates a number of site access points from Edith Weston Road.

9.3 Sustainable Accessibility Improvements

As part of the development, other measures including improvements to sustainable transport accessibility would need to be considered. In order for the development to become a sustainable site, it is likely that key improvements would need to be in place by 2025. Considerations for sustainable transport accessibility improvements are outlined below.

Walking and Cycling Improvements

Walking and cycling are particularly efficient and desirable ways of getting around. It makes best use of available space, contributes to better health and encourages community interaction and active environments. Internally the development will be designed to incorporate a well-defined walking and cycling infrastructure, with the inclusion of safe walking routes and crossings along with cycle routes and parking. Externally the development will provide strategic walking and cycling links to areas such as Oakham, Stamford and Rutland Water and also provide linkages with existing key national routes such as Sustrans Route 63.

Bus Service Improvements

Public transport would play a major role in helping to reduce the levels of road based journeys generated by the development.

The development would be designed to accommodate high quality public transport services, building significantly upon the existing service provision in the area. This would include improved frequency of the No.12 service between Uppingham and Stamford and improved linkage with the No.9 service between Oakham, Stamford and Peterborough, for which an improved frequency would also be provided. Better buses including those with smart ticketing capability and Wi-Fi connectivity would be considered together with better links with rail services at Oakham and Stamford stations.

North Luffenham Rail Station

The existing rail stations on the Midland Mainline that lie closest to the site are at Oakham (11.5 km) and Stamford (14.2 km). Whilst these stations are within a viable driving distance of the proposed site for onward rail journeys, they lie beyond acceptable cycling and walking distances.

Based on the large increase in housing and employment proposed at the site, consideration should be made surrounding the viability of re-introducing a rail station and associated facilities at Luffenham. The station would be approximately 2 km from the site, and if implemented would play a major role in helping to reduce the levels of road based journeys generated by the development.

9.4 Other Recommendations

The number of additional vehicle movements travelling to the east of the development would likely trigger the requirement for highway improvements on Wytchley Warren Lane, such as road widening during the period of 2032-2041.

It is possible that the above improvements would involve third party land outside the red line boundary and would therefore require landowner agreement or compulsory purchase orders.

9.5 Indicative Costs

A summary of the proposed measures and an estimation of costs is provided below.

Table 93: Summary of Mitigation and Indicative Costs

Period	Improvement	Indicative Cost Estimate
2025	Bus service improvements	£200,000 (per year of operation), £200,000 per new bus
	Off-site Walking and Cycling Improvements	£1,000,000 - £1,500,000
	Re-introduction of North Luffenham rail station	£8,000,000
2025-2032	J1 – A6003 / Lyndon Road junction upgraded to a roundabout	£1,500,000
	J2 – Edith Weston Road / Manton Road junction improvement	£600,000
	J8 – Additional access provision on Edith Weston Road	£600,000
	J9 – Pennine Drive / Normanton Road junction improvements	£600,000
2032-2041	J5 – A47 / Station Road junction upgraded to a roundabout	£800,000
	J6 – A606 / Normanton Park Road upgraded to a roundabout	£1,000,000
	Wythchley Warren Lane improvements	£600,000

10. Summary & Conclusions

10.1 Introduction

This Transport Assessment has been prepared on behalf of Rutland County Council (RCC) to provide high level traffic and transport planning recommendations. The advice provided will contribute to the assessment of development options for land currently occupied by St George's Barracks in Edith Weston, Rutland.

The development site currently consists of the St George's Army Barracks and associated surrounding land located close to the rural village of Edith Weston in the county of Rutland. The existing site area is approximately 286 hectares (ha) split over a number of varying sized sections.

10.2 Policy Review

This section provided an overview of local and national planning policy guidance. It is considered that the site accords with relevant national and local guidance and policy, assuming appropriate mitigation is introduced.

10.3 Baseline Conditions

This section provided details on the existing conditions of the local and wider road network in the vicinity of the site, identifying the key junctions and roads that would predominantly be affected by traffic generated by the proposed site. The key road links assessed and the associated 24 hour traffic flow and accidents is shown in Table 94.

Table 94: Key Road Links

Key Road Link	24 Hour Weekday Flow (Two-Way)	Total Accidents (2012-2016)
Edith Weston Road	2,192	18
Manton Road	3,010	8
Normanton Park Road	2,862	7
A6003 (north of Lyndon Road)	11,181	18
A6003 (south of Lyndon Road)	9,751	
A606 (east of Normanton Park Road)	10,436	33
A606 (west of Normanton Park Road)	9,652	
A6121 (east of Station Road)	6,799	17
A6121 (west of Station Road)	4,850	
A47 (east of Station Road)	9,293	41
A47 (west of Station Road)	7,784	
A1 (north of the A606 junction)	46,758	-

10.4 Sustainable Accessibility

This section considered the existing provision for sustainable travel to and from the proposed site and provided a review of walking, cycling and public transport accessibility and facilities.

The site has adequate accessibility for walking and cycling within the vicinity, with a number of local villages and amenities that can be accessed within the maximum distances provided. Public transport to and from the site is considered poor with a single bus service running every 2 hours from Manton Road and the nearest train station located outside the distance made for commuter journeys by cycle (>10 km away).

10.5 Development Proposals

This section outlined the development proposals and site access for the Barracks site, as summarised in Table 11 within the report.

10.6 Trip Generation & Distribution

This section outlined the anticipated generation of vehicle trips as a consequence of the proposed development phases. The estimated trip generations for each assessment year are summarised in Table 95.

Table 95: Development Trip Generation Summary (Total Vehicles)

Assessment Year	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
2025	407	513	920	496	468	964
2032	792	1,205	1,997	1,172	966	2,138
2041	897	1,397	2,293	1,359	1,103	2,462

The trip generations indicate that by 2041, the completed development is predicted to generated 2,293 total trips in the AM Peak and 2,462 trips in the PM peak.

Vehicular trips have been distributed according to the 2011 Census Travel to Work dataset. This dataset combines the details of where people live and work, based on Census output areas, which for the purposes of a traffic and transport assessment can be used to derive a development trip distribution.

10.7 Traffic Impact Assessment Scope

This section provided details of the assessment scope used to inform the junction assessments undertaken as part of the study. The scenarios applied to the operational assessments were as follows:

- 2025 Base Traffic;
- 2025 Base + Development Traffic;
- 2032 Base Traffic;
- 2032 Base + Development Traffic;
- 2041 Base Traffic; and
- 2041 Base + Development Traffic.

Traffic flows have been growthed using TEMPRO NTM growth factors for the 'Rutland 004' area for assessment years of 2025, 2032 and 2041. In order to provide a further degree of robustness to the estimated traffic growth, the growth factors from TEMPRO were compared with results generated by the traffic model produced by AECOM to test the Rutland Local Plan allocations.

10.8 Traffic Impact Assessment

This section provided the results of the operational junction assessments carried out to assess the impacts additional development traffic will have on the local road network and surrounding areas.

A summary of the results along with the suggested mitigation is provided in Table 96.

Table 96: Summary of Junction Assessments

Junction	2025 Base	2025 Base (With Development)	2032 Base	2032 Base (With Development)	2041 Base	2041 Base (With Development)
Junction 1(A)	✓	✓	✓	✗	✓	✗
Junction 1(B)	✓	✓	✓	~	✓	✗
Junction 1(C)	✓	✓	✓	~	✓	✗
<i>With Improvements</i>	✓	✓	✓	✓	✓	✓
Junction 2	✓	✓	✓	✓	✓	~
<i>With Improvements</i>	✓	✓	✓	✓	✓	✓
Junction 3	✓	✓	✓	✓	✓	✓
Junction 4	✓	✓	✓	✓	✓	✓
Junction 5	✓	✓	✓	~	✓	✗
<i>With Improvements</i>	✓	✓	✓	✓	✓	✓
Junction 6	✓	✓	✓	~	✓	✗
<i>With Improvements</i>	✓	✓	✓	✓	✓	✓
Junction 7	✓	✓	✓	✓	✓	✓
Junction 8 (Site Access)	✓	✗	✓	✗	✓	✗
Junction 9	✓	✓	✓	~	✓	✗
<i>With Improvements</i>	✓	✓	✓	✓	✓	~

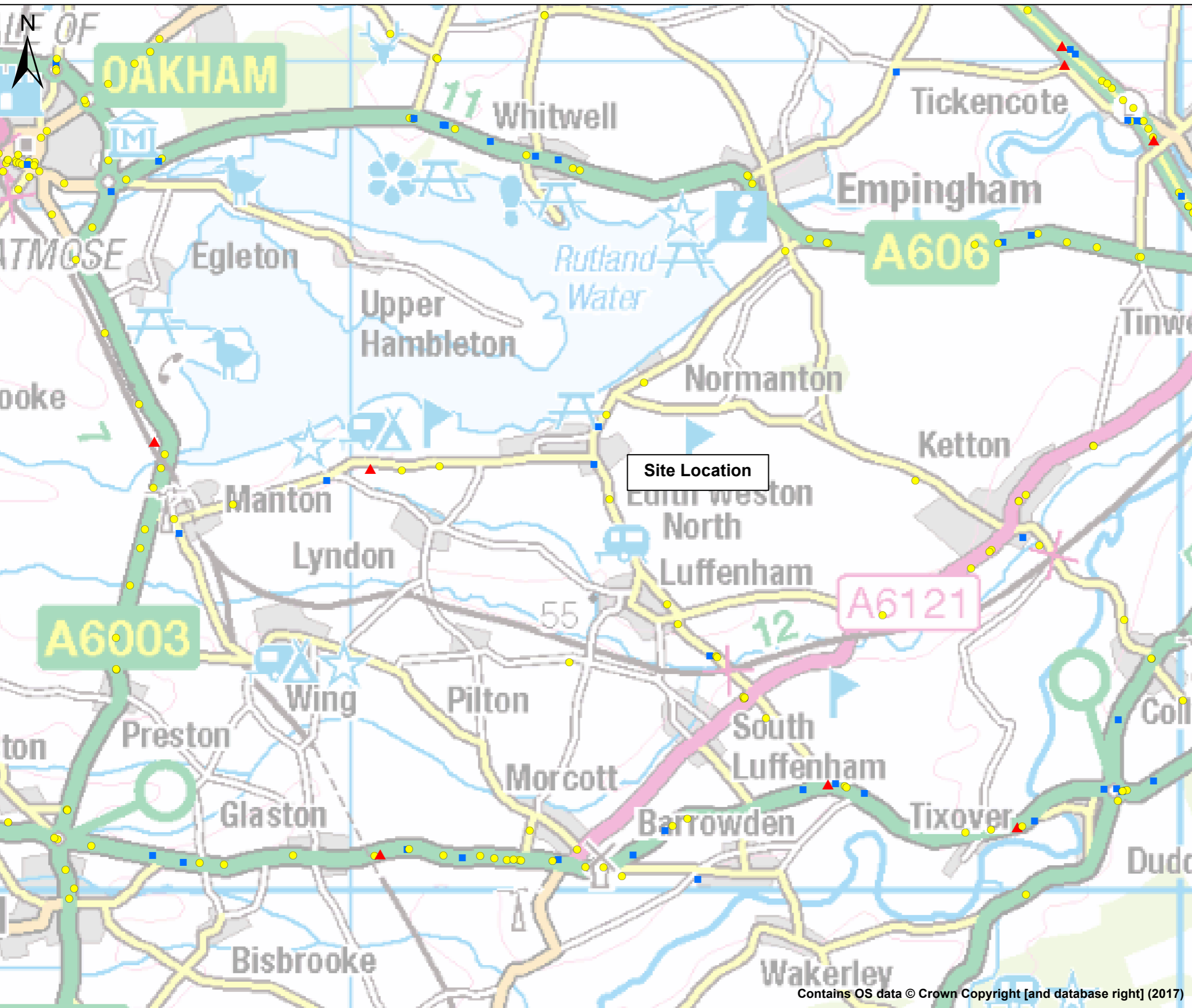
10.9 Measures

A summary of the proposed mitigation and an estimation of costs to be considered is provided below.

Table 97: Summary of Mitigation and Indicative Costs

Period	Improvement	Indicative Cost Estimate
2025	Bus service improvements	£200,000 (per year of operation), £200,000 per new bus
	Off-site Walking and Cycling Improvements	£1,000,000 - £1,500,000
	Re-introduction of North Luffenham rail station	£8,000,000
2025-2032	J1 – A6003 / Lyndon Road junction upgraded to a roundabout	£1,500,000
	J2 – Edith Weston Road / Manton Road junction improvement	£600,000
	J8 – Additional access provision on Edith Weston Road	£600,000
	J9 – Pennine Drive / Normanton Road junction improvements	£600,000
2032-2041	J5 – A47 / Station Road junction upgraded to a roundabout	£800,000
	J6 – A606 / Normanton Park Road upgraded to a roundabout	£1,000,000
	Wythchley Warren Lane improvements	£600,000

Appendix A Plans and Drawings



KEY:
Study Area
Accidents

- Severity**
- ▲ 1
 - 2
 - 3

DRAFT

Title:
 Accident Locations (2012-2016)

Project: St George's Barracks
 Transport Assessment

Drawn:	HE	Design:	HE
Checked:	MR	Scale:	NTS
Approved:	SM	Date:	27.10.17

Client:



Rutland
 County Council



5th Floor
 2 City Walk
 Leeds
 LS11 9AR

Tel: 0113 391 6800
 Fax: 0133 391 6899
 www.aecom.com

Drawing No.: 60554946-001

J:\JOB FILES\02581 ST GEORGE'S BARRACKS - RUTLAND\DRAWINGS\01 FABRIK\WORKING\PHOTOSHOP



LEGEND

- SITE BOUNDARY
- DEVELOPMENT BLOCK
- LOCAL CENTRE
- PRIMARY SCHOOL
- ENTERPRISE ZONE
- WATER BODY
- OPEN SPACE
- COUNTRY PARK
- HERITAGE ZONE
- WOODLAND / LANDSCAPE BUFFER
- RETAINED TREES

REV.	DESCRIPTION	APP. DATE
A	Country park amendments	AS 16.05.18



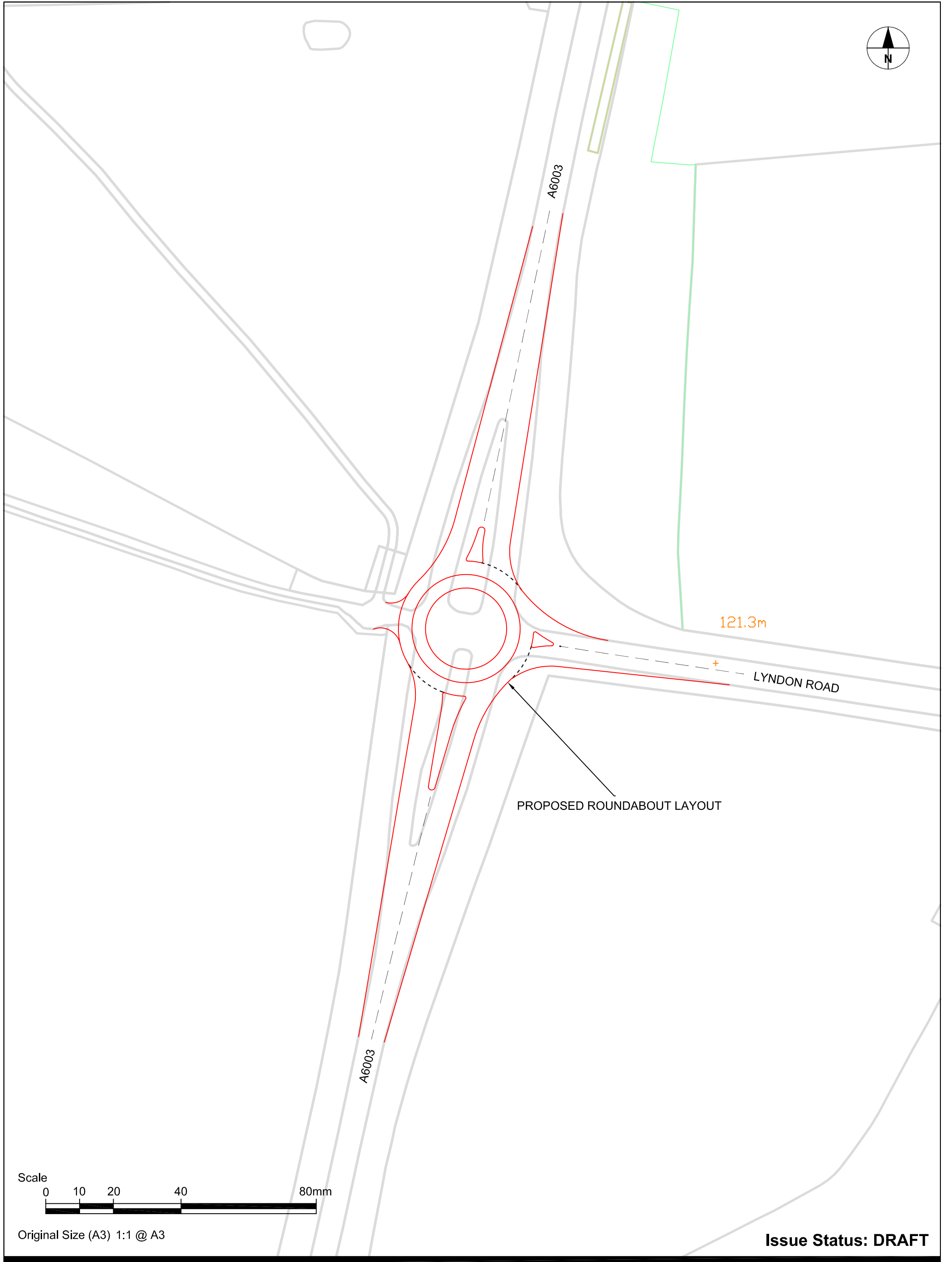
PROJECT TITLE
ST GEORGE'S BARRACKS, RUTLAND

DRAWING TITLE
DRAFT HIGH-LEVEL MASTERPLAN

ISSUED BY London **T:** 020 7620 1453
DATE APRIL 2017 **DRAWN** BS
SCALE@A1 1:5000 **CHECKED** BS
STATUS DRAFT **APPROVED** AS
DWG. NO. D2581_036

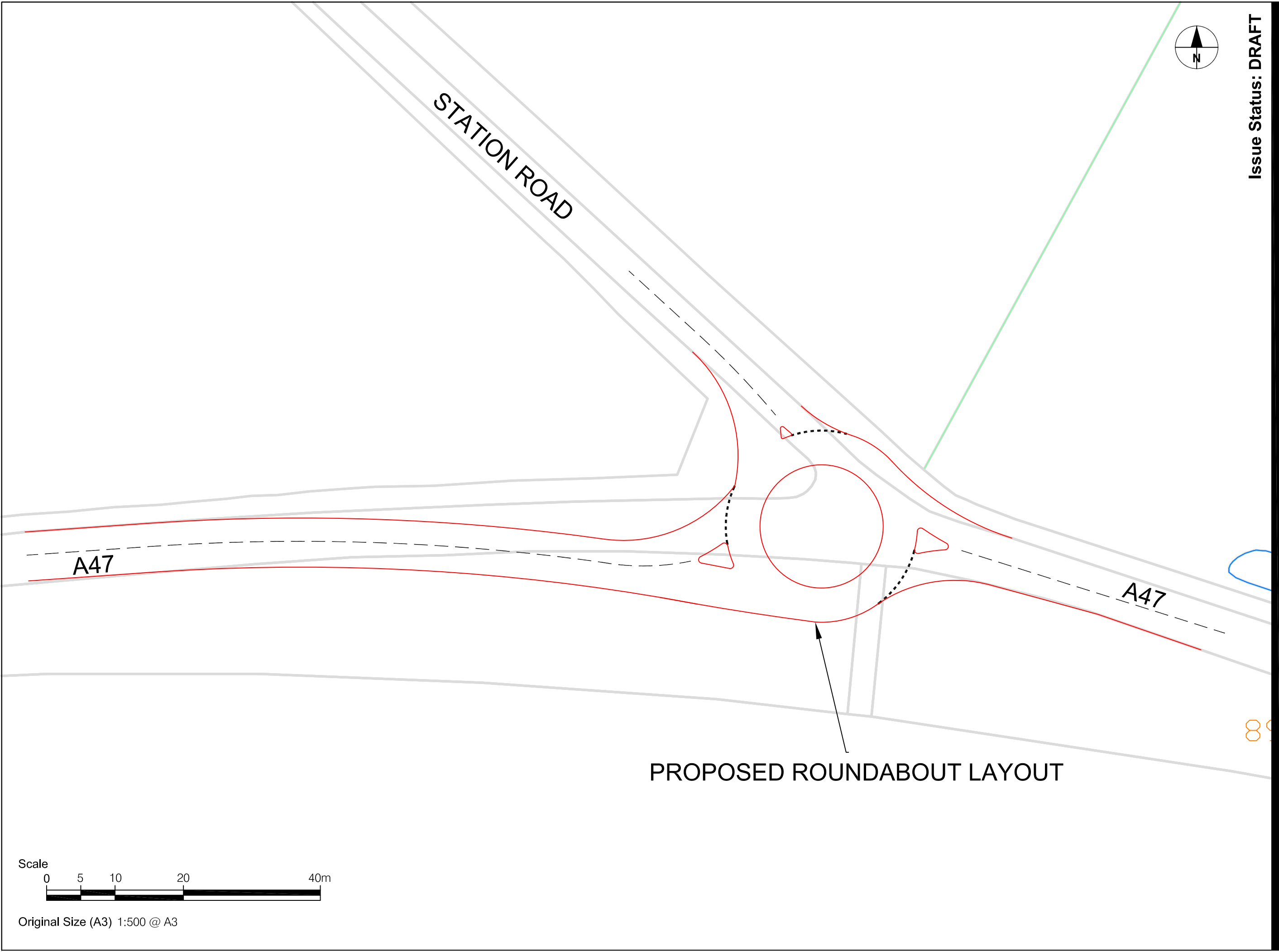
Notes:
1. This drawing is the property of fabrik ltd. It must not be copied or reproduced without written consent.
2. Only figured dimensions are to be taken from this drawing. All contractors must visit site and be responsible for taking and checking all dimensions related to the works shown on this drawing.





Original Size (A3) 1:1 @ A3

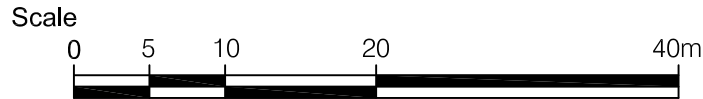
Issue Status: DRAFT



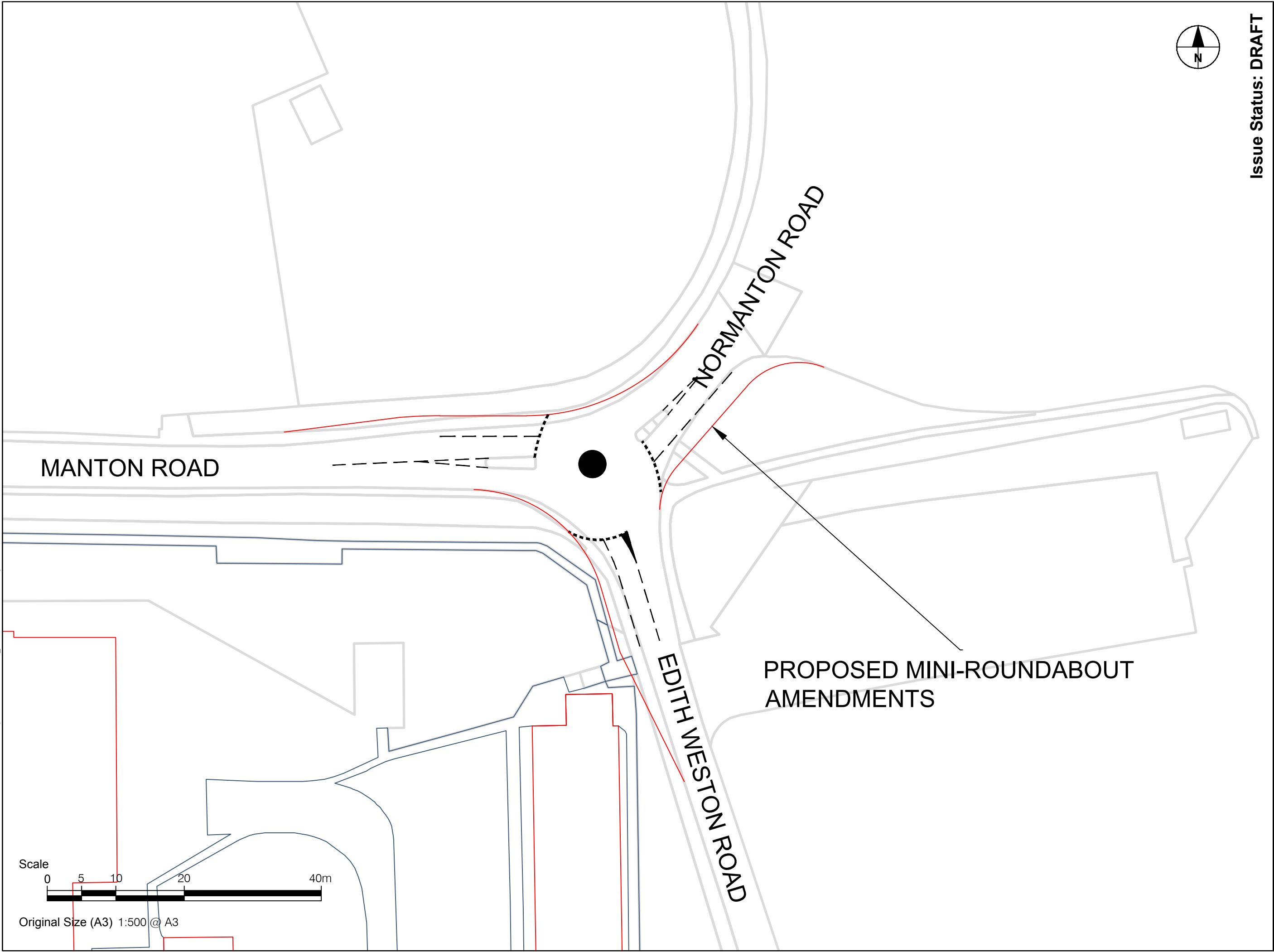
Issue Status: DRAFT

A47/STATION ROAD
PROPOSED ROUNDABOUT LAYOUT

ST GEORGES BARRACKS



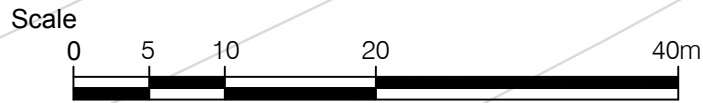
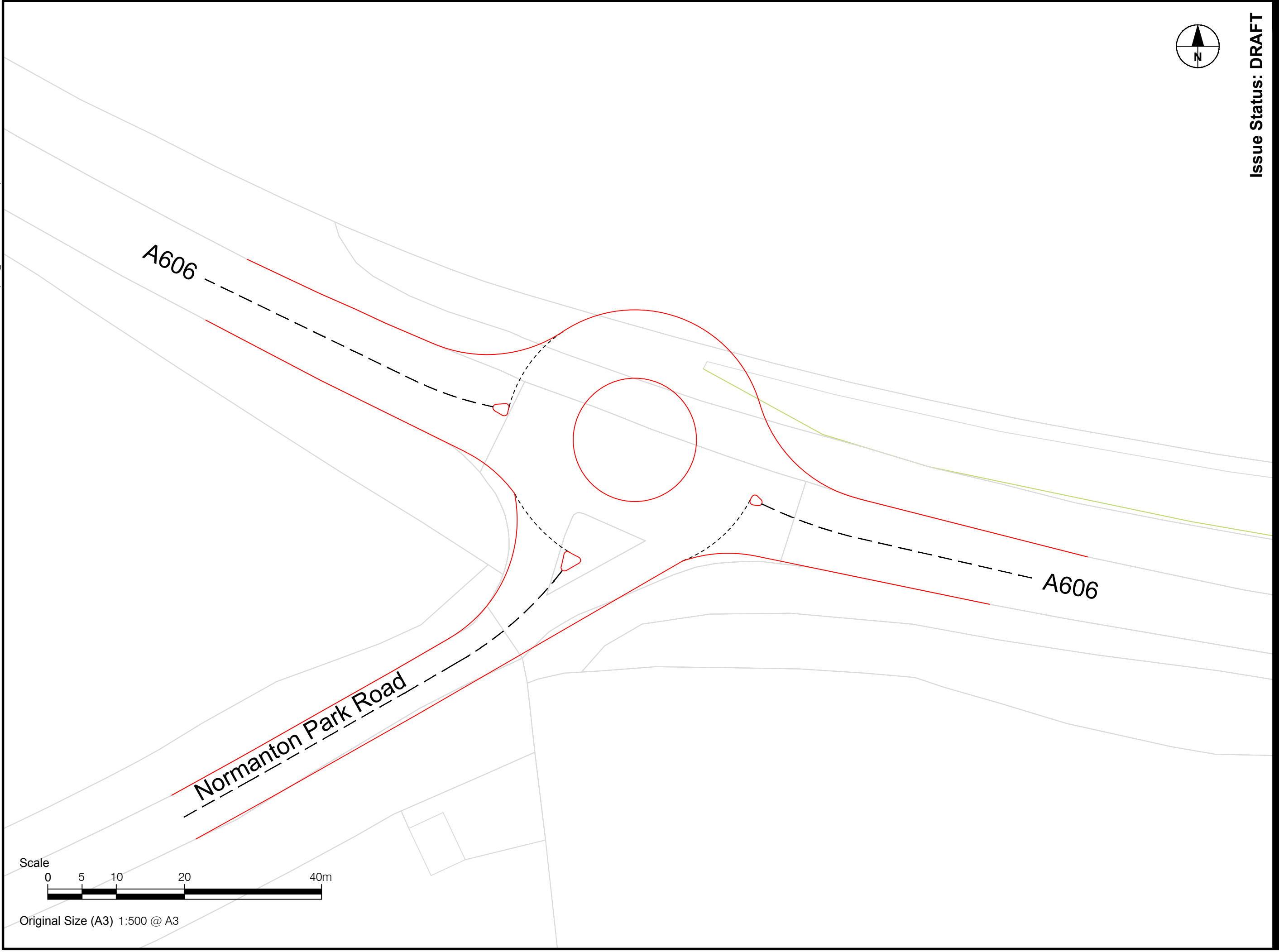
Original Size (A3) 1:500 @ A3



Issue Status: DRAFT

ST GEORGES BARRACKS
MANTON ROAD/EDITH WESTON ROAD
PROPOSED MINI-ROUNDAABOUT AMENDMENTS

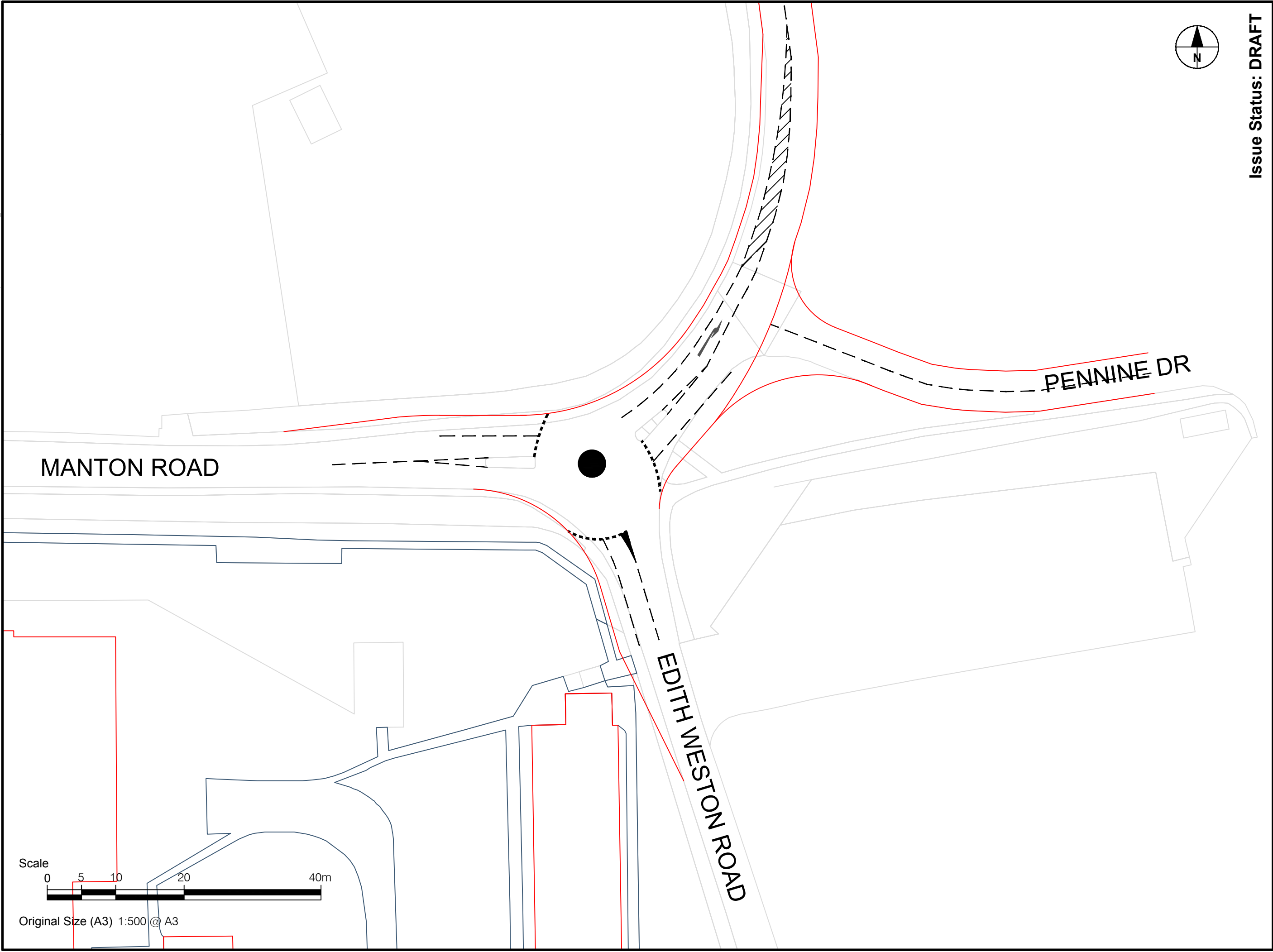




Original Size (A3) 1:500 @ A3



Issue Status: DRAFT



MANTON ROAD

EDITH WESTON ROAD

PENNINE DR

Scale
0 5 10 20 40m

Original Size (A3) 1:500 @ A3

Issue Status: DRAFT

Appendix B Development Build Out Rates

Indicative Phasing and Timings

Assumed Occupations / Completions

Element	Capacity	Delivery Rate	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	Total	
Officer's Mess																										
Residential	70 homes	up to 100 dwpa		70																					70	
Main Site - Western Area																										
Residential (inc village core)	3000 homes	up to 300 dwpa			300	300	300	300	300	300	300	300	300	300												3000
Employment - early delivery additional provision by RCC	5Ha. Assume 22,000 sqm B1/B2/B8. (Mix to be discussed with RCC)	up to 5000 sqm pa		2000	5000	5000	5000	5000																		22000
Employment - in parallel with western residential	7.7Ha: Assume 33,600 sqm B1: 21%/ B2: 42%; B8 (ancillary to B1/B2): 37%	up to 3200 sqm pa			3000	3000	3000	3000	3000	3000	3000	3000	3200	3200	3200											33600
Employment - in parallel with eastern residential	1.3 Ha: Assume 5,600 sqm B1: 21%/ B2: 42%; B8 (ancillary to B1/B2): 37%	up to 1400 sqm pa																			1400	1400	1400	1400	5600	
Community & Leisure	Education, Health, Community Facilities: approx 9,000 sqm	3 phases			3000			3000			3000														9000	
Retail	3000 sqm	3 phases			1000			1000			1000														3000	
Main Site - Eastern Area																										
Residential	500 homes	up to 150 dwpa																								500
		Homes	0	70	300	300	300	300	300	300	300	300	300	300	0	0	0	0	0	0	100	150	150	100		3570
		SOM non-residential	0	2000	12000	8000	8000	12000	3000	3000	7000	3000	3200	3200	3200	0	0	0	0	0	1400	1400	1400	1400		73200

St Georges Barracks: Vehicle Trip Generations

Officer's Mess

Residential	70 Units
Trip - AM Peak In	0.144
Trip - AM Peak Out	0.371
Trip - PM Peak In	0.365
Trip - PM Peak Out	0.217

Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
70																				
10																				
26																				
26																				
15																				

Main Site - Western Area

Residential (inc. village core)	3000 Units
Trip - AM Peak In	0.144
Trip - AM Peak Out	0.371
Trip - PM Peak In	0.365
Trip - PM Peak Out	0.217

Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
300																				
43																				
43																				
111																				
110																				
65																				

5Ha: B1/B2/B8	22000 m ²
B1	33% 7326
Trip - AM Peak In	1.387
Trip - AM Peak Out	0.223
Trip - PM Peak In	0.165
Trip - PM Peak Out	1.18

2000	5000	5000	5000	5000
666	1665	1665	1665	1665
9	23	23	23	23
1	4	4	4	4
1	3	3	3	3
8	20	20	20	20

B2	33% 7326
Trip - AM Peak In	0.458
Trip - AM Peak Out	0.094
Trip - PM Peak In	0.047
Trip - PM Peak Out	0.388

666	1665	1665	1665	1665
3	8	8	8	8
1	1	1	1	1
0	1	1	1	1
3	6	6	6	6

B8	33% 7326
Trip - AM Peak In	0.265
Trip - AM Peak Out	0.08
Trip - PM Peak In	0.088
Trip - PM Peak Out	0.24

666	1665	1665	1665	1665
2	4	4	4	4
1	1	1	1	1
1	1	1	1	1
2	4	4	4	4

7.7Ha: B1/B2/B8	33600 m ²
B1	21% 7056
Trip - AM Peak In	1.387
Trip - AM Peak Out	0.223
Trip - PM Peak In	0.165
Trip - PM Peak Out	1.18

3000	3000	3000	3000	3000	3000	3000	3000	3200	3200	3200
630	630	630	630	630	630	630	630	672	672	672
9	9	9	9	9	9	9	9	9	9	9
1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1
7	7	7	7	7	7	7	7	8	8	8

B2	42% 14112
Trip - AM Peak In	0.458
Trip - AM Peak Out	0.094
Trip - PM Peak In	0.047
Trip - PM Peak Out	0.388

1260	1260	1260	1260	1260	1260	1260	1260	1344	1344	1344
6	6	6	6	6	6	6	6	6	6	6
1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1
5	5	5	5	5	5	5	5	5	5	5

B8	37% 12432
Trip - AM Peak In	0.265
Trip - AM Peak Out	0.08
Trip - PM Peak In	0.088
Trip - PM Peak Out	0.24

1110	1110	1110	1110	1110	1110	1110	1110	1184	1184	1184
3	3	3	3	3	3	3	3	3	3	3
1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1
3	3	3	3	3	3	3	3	3	3	3

1.3 Ha: B1/B2/B8	5600 m ²
B1	21% 1176
Trip - AM Peak In	1.387
Trip - AM Peak Out	0.223
Trip - PM Peak In	0.165
Trip - PM Peak Out	1.18

	1400	1400	1400	1400
	294	294	294	294
	4	4	4	4
	1	1	1	1
	0	0	0	0
	3	3	3	3

B2	42% 2352
Trip - AM Peak In	0.458
Trip - AM Peak Out	0.094
Trip - PM Peak In	0.047
Trip - PM Peak Out	0.388

	588	588	588	588
	3	3	3	3
	0	0	0	0
	0	0	0	0
	2	2	2	2

B8	37% 2072
Trip - AM Peak In	0.265
Trip - AM Peak Out	0.08
Trip - PM Peak In	0.088
Trip - PM Peak Out	0.24

	518	518	518	518
	1	1	1	1
	0	0	0	0
	0	0	0	0
	1	1	1	1

Main Site - Eastern Area

Residential (inc. village core)	500 Units
Trip - AM Peak In	0.144
Trip - AM Peak Out	0.371
Trip - PM Peak In	0.365
Trip - PM Peak Out	0.217

Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
100																				
14																				
37																				
37																				
22																				

Accumulation Year on Year

Total Development	
Trip - AM Peak In	
Trip - AM Peak Out	
Trip - PM Peak In	
Trip - PM Peak Out	

Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
24	120	216	311	407	468	529	589	650	712	773	792						815	844	874	897
29	150	271	392	513	628	742	857	972	1086	1201	1205						1244	1301	1358	1397
28	145	262	379	496	608	720	832	944	1057	1169	1172						1209	1265	1321	1359
27	137	248	358	468	548	628	708	788	869	951	966						995	1035	1074	1103

Appendix C TRICS Data

TRICS 7.1.2

Trip Rate Parameter: Gross floor area

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
 Calculation Factor: 100 sqm
 Count Type: VEHICLES

Time Range	ARRIVALS				DEPARTURES				TOTALS	1	0.731
	No. Days	Ave. Trip Rate	No. Days	Ave. Trip Rate	No. Days	Ave. Trip Rate	No. Days	Ave. Trip Rate	Trip Rate		
00:00-00:30											
00:30-01:00											
01:00-01:30											
01:30-02:00											
02:00-02:30											
02:30-03:00											
03:00-03:30											
03:30-04:00											
04:00-04:30											
04:30-05:00											
05:00-05:30	1	19974	0		1	19974	0.005	1	19974	0.005	0.005
05:30-06:00	1	19974	0.02		1	19974	0.005	1	19974	0.025	0.025
06:00-06:30	1	19974	0.07		1	19974	0.005	1	19974	0.075	0.075
06:30-07:00	2	45133	0.676		2	45133	0.188	2	45133	0.864	0.864
07:00-07:30	54	9123	0.246		54	9123	0.046	54	9123	0.292	0.292
07:30-08:00	54	9123	0.475		54	9123	0.087	54	9123	0.562	0.562
08:00-08:30	54	9123	0.656		54	9123	0.11	54	9123	0.766	0.766
08:30-09:00	54	9123	0.731		54	9123	0.113	54	9123	0.844	0.844
09:00-09:30	54	9123	0.532		54	9123	0.123	54	9123	0.655	0.655
09:30-10:00	54	9123	0.309		54	9123	0.111	54	9123	0.42	0.42
10:00-10:30	54	9123	0.195		54	9123	0.097	54	9123	0.292	0.292
10:30-11:00	54	9123	0.164		54	9123	0.095	54	9123	0.259	0.259
11:00-11:30	54	9123	0.146		54	9123	0.11	54	9123	0.256	0.256
11:30-12:00	54	9123	0.133		54	9123	0.109	54	9123	0.242	0.242
12:00-12:30	54	9123	0.128		54	9123	0.146	54	9123	0.274	0.274
12:30-13:00	54	9123	0.138		54	9123	0.159	54	9123	0.297	0.297
13:00-13:30	54	9123	0.153		54	9123	0.151	54	9123	0.304	0.304
13:30-14:00	54	9123	0.163		54	9123	0.127	54	9123	0.29	0.29
14:00-14:30	54	9123	0.142		54	9123	0.126	54	9123	0.268	0.268
14:30-15:00	54	9123	0.125		54	9123	0.185	54	9123	0.31	0.31
15:00-15:30	54	9123	0.114		54	9123	0.225	54	9123	0.339	0.339
15:30-16:00	54	9123	0.12		54	9123	0.281	54	9123	0.401	0.401
16:00-16:30	54	9123	0.114		54	9123	0.478	54	9123	0.592	0.592
16:30-17:00	54	9123	0.106		54	9123	0.547	54	9123	0.653	0.653
17:00-17:30	54	9123	0.098		54	9123	0.752	54	9123	0.85	0.85
17:30-18:00	54	9123	0.067		54	9123	0.428	54	9123	0.495	0.495
18:00-18:30	54	9123	0.051		54	9123	0.283	54	9123	0.334	0.334
18:30-19:00	54	9123	0.033		54	9123	0.149	54	9123	0.182	0.182
19:00-19:30	1	70291	0.095		1	70291	0.128	1	70291	0.223	0.223
19:30-20:00	1	70291	0.08		1	70291	0.09	1	70291	0.17	0.17
20:00-20:30	1	70291	0.088		1	70291	0.115	1	70291	0.203	0.203
20:30-21:00	1	70291	0.097		1	70291	0.083	1	70291	0.18	0.18
21:00-21:30	1	70291	0.085		1	70291	0.184	1	70291	0.269	0.269
21:30-22:00											
22:00-22:30											
22:30-23:00											
23:00-23:30											
23:30-24:00											
Daily Trip Rates:			6.35				5.841			12.191	

TRICS 7.1.2
 Trip Rate Parameter: Gross floor area

TRIP RATE for Land Use 02 - EMPLOYMENT/C - INDUSTRIAL UNIT
 Calculation Factor: 100 sqm
 Count Type: VEHICLES

Time Range	ARRIVALS			DEPARTURES			TOTALS						
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate				
00:00-00:30													
00:30-01:00													
01:00-01:30													
01:30-02:00													
02:00-02:30													
02:30-03:00													
03:00-03:30													
03:30-04:00													
04:00-04:30													
04:30-05:00													
05:00-05:30													
05:30-06:00													
06:00-06:30	1	11375	0.026	1	11375	0	1	11375	0.026	06:00-07:00	Arrivals	Departures	Total
06:30-07:00	1	11375	0.123	1	11375	0.044	1	11375	0.167		0.149	0.044	0.193
07:00-07:30	26	7329	0.091	26	7329	0.046	26	7329	0.137	07:00-08:00	0.316	0.09	0.406
07:30-08:00	26	7329	0.225	26	7329	0.044	26	7329	0.269				
08:00-08:30	26	7329	0.278	26	7329	0.044	26	7329	0.322	08:00-09:00	0.458	0.084	0.542
08:30-09:00	26	7329	0.18	26	7329	0.04	26	7329	0.22				
09:00-09:30	26	7329	0.095	26	7329	0.047	26	7329	0.142	09:00-10:00	0.165	0.1	0.265
09:30-10:00	26	7329	0.07	26	7329	0.053	26	7329	0.123				
10:00-10:30	26	7329	0.055	26	7329	0.051	26	7329	0.106	10:00-11:00	0.106	0.096	0.202
10:30-11:00	26	7329	0.051	26	7329	0.045	26	7329	0.096				
11:00-11:30	26	7329	0.043	26	7329	0.039	26	7329	0.082	11:00-12:00	0.091	0.084	0.175
11:30-12:00	26	7329	0.048	26	7329	0.045	26	7329	0.093				
12:00-12:30	26	7329	0.048	26	7329	0.08	26	7329	0.128	12:00-13:00	0.116	0.157	0.273
12:30-13:00	26	7329	0.068	26	7329	0.077	26	7329	0.145				
13:00-13:30	26	7329	0.105	26	7329	0.085	26	7329	0.19	13:00-14:00	0.26	0.161	0.421
13:30-14:00	26	7329	0.155	26	7329	0.076	26	7329	0.231				
14:00-14:30	26	7329	0.089	26	7329	0.193	26	7329	0.282	14:00-15:00	0.177	0.275	0.452
14:30-15:00	26	7329	0.088	26	7329	0.082	26	7329	0.17				
15:00-15:30	26	7329	0.058	26	7329	0.102	26	7329	0.16	15:00-16:00	0.117	0.195	0.312
15:30-16:00	26	7329	0.059	26	7329	0.093	26	7329	0.152				
16:00-16:30	26	7329	0.044	26	7329	0.089	26	7329	0.133	16:00-17:00	0.088	0.282	0.37
16:30-17:00	26	7329	0.044	26	7329	0.193	26	7329	0.237				
17:00-17:30	26	7329	0.026	26	7329	0.155	26	7329	0.181	17:00-18:00	0.047	0.388	0.435
17:30-18:00	26	7329	0.021	26	7329	0.233	26	7329	0.254				
18:00-18:30	25	7426	0.027	25	7426	0.103	25	7426	0.13	18:00-19:00	0.056	0.166	0.222
18:30-19:00	25	7426	0.029	25	7426	0.063	25	7426	0.092				
19:00-19:30	1	11375	0.035	1	11375	0.044	1	11375	0.079	19:00-20:00	0.044	0.132	0.176
19:30-20:00	1	11375	0.009	1	11375	0.088	1	11375	0.097				
20:00-20:30													
20:30-21:00													
21:00-21:30													
21:30-22:00													
22:00-22:30													
22:30-23:00													
23:00-23:30													
23:30-24:00													
Daily Trip Rates:			2.19			2.254			4.444				

TRICS 7.4.1

Trip Rate Parameter: Gross floor area

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)

Calculation Factor: 100 sqm

Count Type: VEHICLES

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00-00:30									
00:30-01:00									
01:00-01:30									
01:30-02:00									
02:00-02:30									
02:30-03:00									
03:00-03:30									
03:30-04:00									
04:00-04:30									
04:30-05:00									
05:00-05:30	2	12610	0.012	2	12610	0.016	2	12610	0.028
05:30-06:00	2	12610	0.016	2	12610	0.02	2	12610	0.036
06:00-06:30	2	12610	0.02	2	12610	0.02	2	12610	0.04
06:30-07:00	2	12610	0.048	2	12610	0.04	2	12610	0.088
07:00-07:30	17	8380	0.061	17	8380	0.051	17	8380	0.112
07:30-08:00	18	7956	0.101	18	7956	0.038	18	7956	0.139
08:00-08:30	18	7956	0.117	18	7956	0.034	18	7956	0.151
08:30-09:00	18	7956	0.148	18	7956	0.046	18	7956	0.194
09:00-09:30	18	7956	0.084	18	7956	0.046	18	7956	0.13
09:30-10:00	18	7956	0.053	18	7956	0.05	18	7956	0.103
10:00-10:30	18	7956	0.058	18	7956	0.055	18	7956	0.113
10:30-11:00	18	7956	0.052	18	7956	0.051	18	7956	0.103
11:00-11:30	18	7956	0.048	18	7956	0.052	18	7956	0.1
11:30-12:00	18	7956	0.052	18	7956	0.044	18	7956	0.096
12:00-12:30	18	7956	0.061	18	7956	0.071	18	7956	0.132
12:30-13:00	18	7956	0.058	18	7956	0.058	18	7956	0.116
13:00-13:30	18	7956	0.086	18	7956	0.078	18	7956	0.164
13:30-14:00	18	7956	0.081	18	7956	0.055	18	7956	0.136
14:00-14:30	18	7956	0.079	18	7956	0.068	18	7956	0.147
14:30-15:00	18	7956	0.071	18	7956	0.073	18	7956	0.144
15:00-15:30	18	7956	0.059	18	7956	0.082	18	7956	0.141
15:30-16:00	18	7956	0.05	18	7956	0.064	18	7956	0.114
16:00-16:30	18	7956	0.047	18	7956	0.074	18	7956	0.121
16:30-17:00	18	7956	0.046	18	7956	0.078	18	7956	0.124
17:00-17:30	18	7956	0.041	18	7956	0.101	18	7956	0.142
17:30-18:00	18	7956	0.047	18	7956	0.139	18	7956	0.186
18:00-18:30	18	7956	0.035	18	7956	0.087	18	7956	0.122
18:30-19:00	18	7956	0.022	18	7956	0.05	18	7956	0.072
19:00-19:30	2	12610	0.044	2	12610	0.024	2	12610	0.068
19:30-20:00	2	12610	0.012	2	12610	0.028	2	12610	0.04
20:00-20:30	2	12610	0.008	2	12610	0.02	2	12610	0.028
20:30-21:00	2	12610	0.016	2	12610	0.024	2	12610	0.04
21:00-21:30	1	22270	0.018	1	22270	0.009	1	22270	0.027
21:30-22:00	1	22270	0.013	1	22270	0.009	1	22270	0.022
22:00-22:30									
22:30-23:00									
23:00-23:30									
23:30-24:00									
Daily Trip Rates:			1.764			1.755			3.519

	Arrivals	Departures	Total
06:00-07:00	0.068	0.06	0.128
07:00-08:00	0.162	0.089	0.251
08:00-09:00	0.265	0.080	0.345
09:00-10:00	0.137	0.096	0.233
10:00-11:00	0.11	0.106	0.216
11:00-12:00	0.1	0.096	0.196
12:00-13:00	0.119	0.129	0.248
13:00-14:00	0.167	0.133	0.3
14:00-15:00	0.15	0.141	0.291
15:00-16:00	0.109	0.146	0.255
16:00-17:00	0.093	0.152	0.245
17:00-18:00	0.088	0.24	0.328
18:00-19:00	0.057	0.137	0.194
19:00-20:00	0.056	0.052	0.108

TRICS 7.1.2

Trip Rate Parar Number of dw ellings

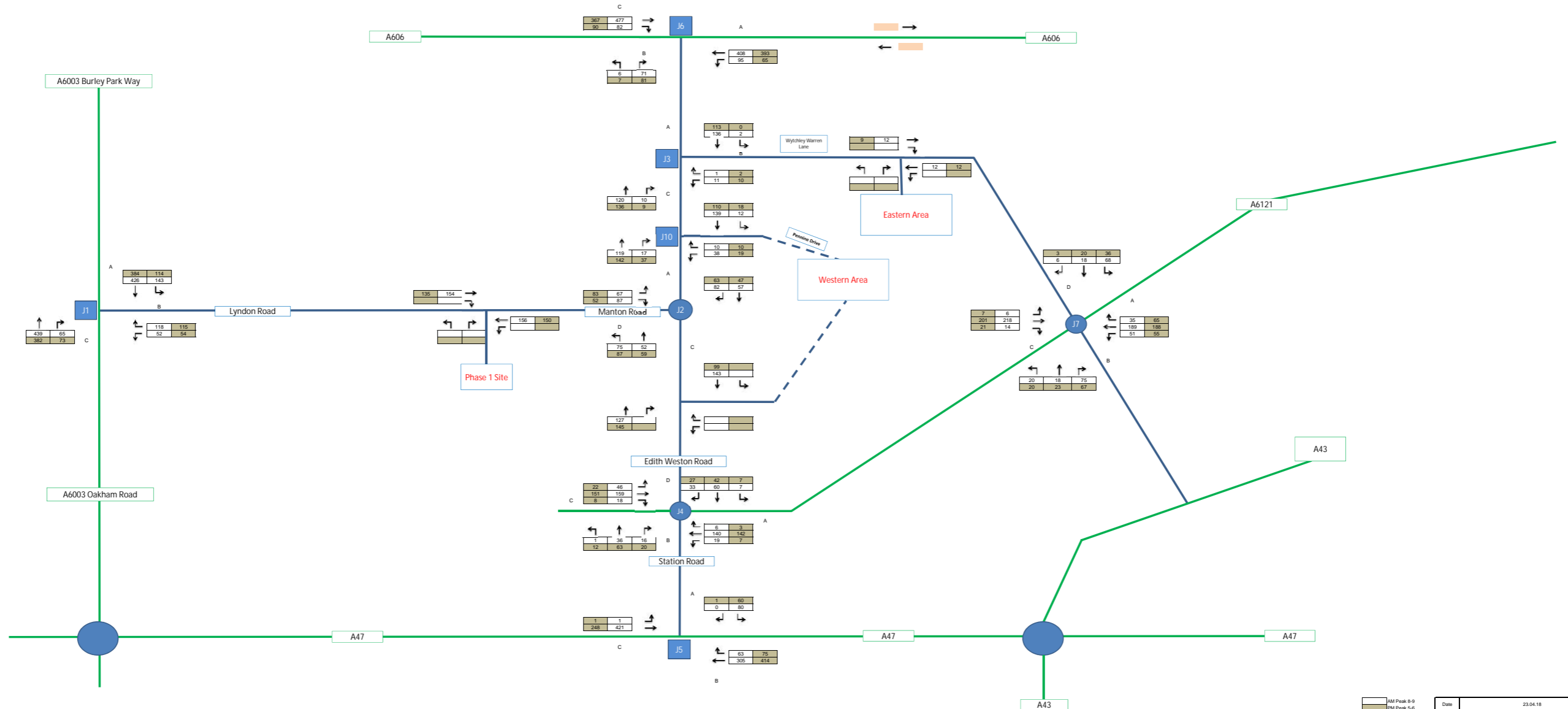
TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

Calculation Factor: 1 DWELLS

Count Type: VEHICLES

Time Range	No. Days	ARRIVALS			DEPARTURES			TOTALS	
		Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00-01:00									
01:00-02:00									
02:00-03:00									
03:00-04:00									
04:00-05:00									
05:00-06:00									
06:00-07:00									
07:00-08:00	70	68	0.072	70	68	0.258	70	68	0.33
08:00-09:00	70	68	0.144	70	68	0.371	70	68	0.515
09:00-10:00	70	68	0.154	70	68	0.211	70	68	0.365
10:00-11:00	70	68	0.149	70	68	0.182	70	68	0.331
11:00-12:00	70	68	0.169	70	68	0.183	70	68	0.352
12:00-13:00	70	68	0.196	70	68	0.178	70	68	0.374
13:00-14:00	70	68	0.192	70	68	0.177	70	68	0.369
14:00-15:00	70	68	0.187	70	68	0.196	70	68	0.383
15:00-16:00	70	68	0.273	70	68	0.194	70	68	0.467
16:00-17:00	70	68	0.306	70	68	0.186	70	68	0.492
17:00-18:00	70	68	0.365	70	68	0.217	70	68	0.582
18:00-19:00	70	68	0.25	70	68	0.189	70	68	0.439
19:00-20:00									
20:00-21:00									
21:00-22:00									
22:00-23:00									
23:00-24:00									
Daily Trip Rates:			2.457			2.542			4.999

Appendix D Traffic Flow & Distribution Diagrams

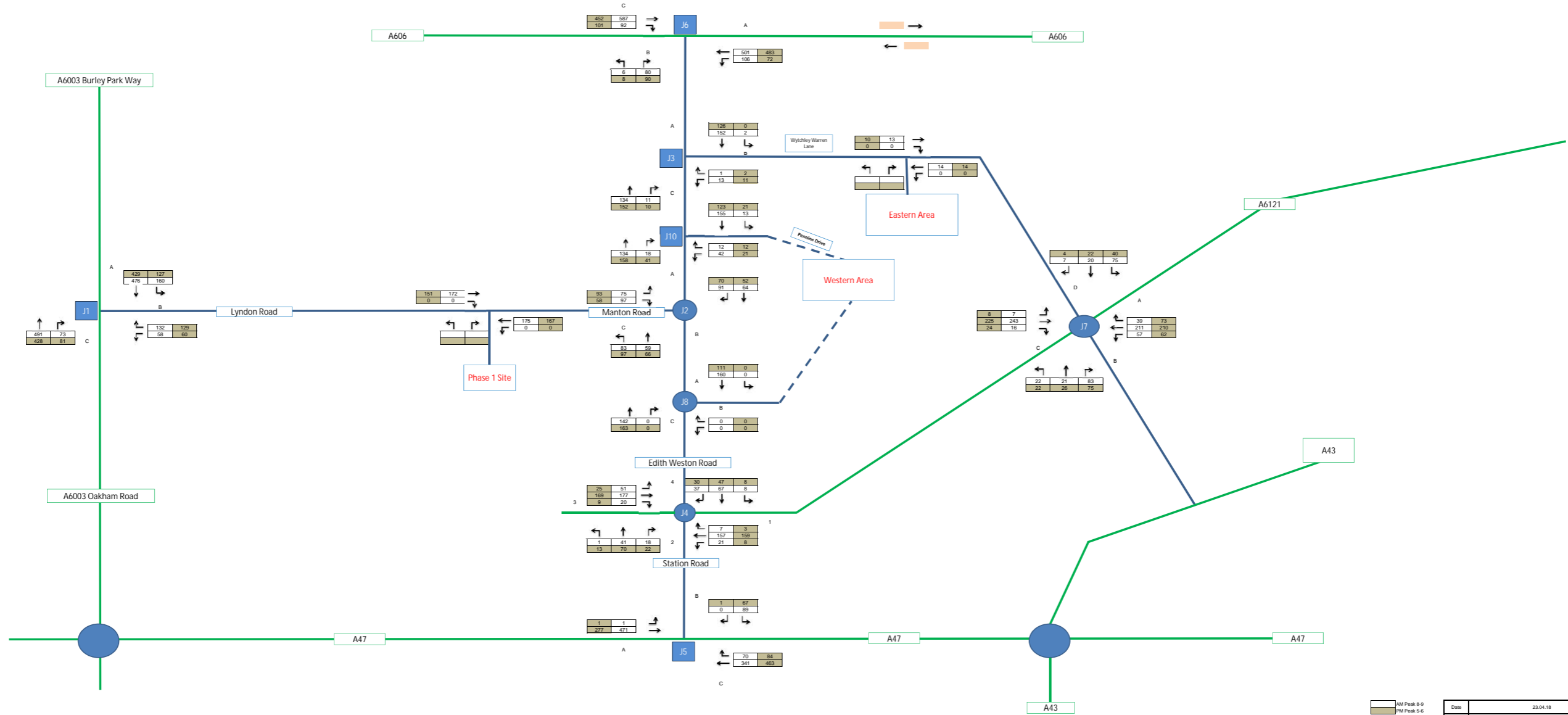


<table border="1"> <tr> <td>AM Peak 8-9</td> <td>Date</td> <td>23.04.18</td> </tr> <tr> <td>PM Peak 5-6</td> <td>Design</td> <td>MR</td> </tr> <tr> <td></td> <td>Checked</td> <td>PF</td> </tr> <tr> <td></td> <td>Approved</td> <td>PF</td> </tr> </table>	AM Peak 8-9	Date	23.04.18	PM Peak 5-6	Design	MR		Checked	PF		Approved	PF	<table border="1"> <tr> <td>Revision:</td> <td>A</td> </tr> </table>	Revision:	A
AM Peak 8-9	Date	23.04.18													
PM Peak 5-6	Design	MR													
	Checked	PF													
	Approved	PF													
Revision:	A														

Base 2025 Flows
PCUs

AM	1,1138
PM	1,1232
Avg	1,1185

NOTES
*An additional 10% growth has been assumed to represent the expected growth patterns on the A606. These have been applied to the mainline flows, not turning flows.

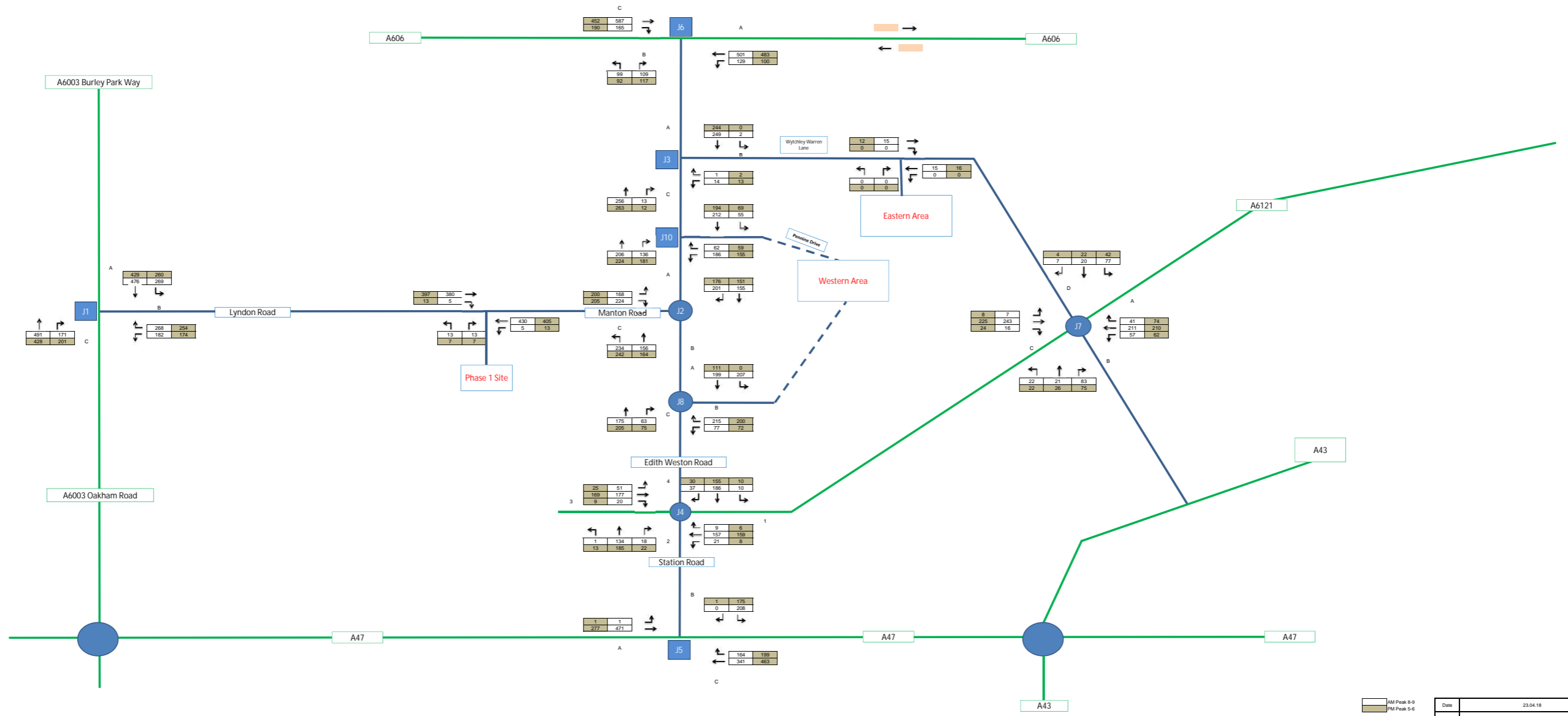


AM Peak 9-9	Date	23.04.18
PM Peak 5-6	Design	MR
	Checked	PF
	Approved	PF

Base 2025 Flows
PCUs

AM	1,1138
PM	1,1232
Avg	1,1185

NOTES
*An additional 10% growth has been assumed to represent the expected growth patterns on the A606. These have been applied to the mainline flows, not turning flows.

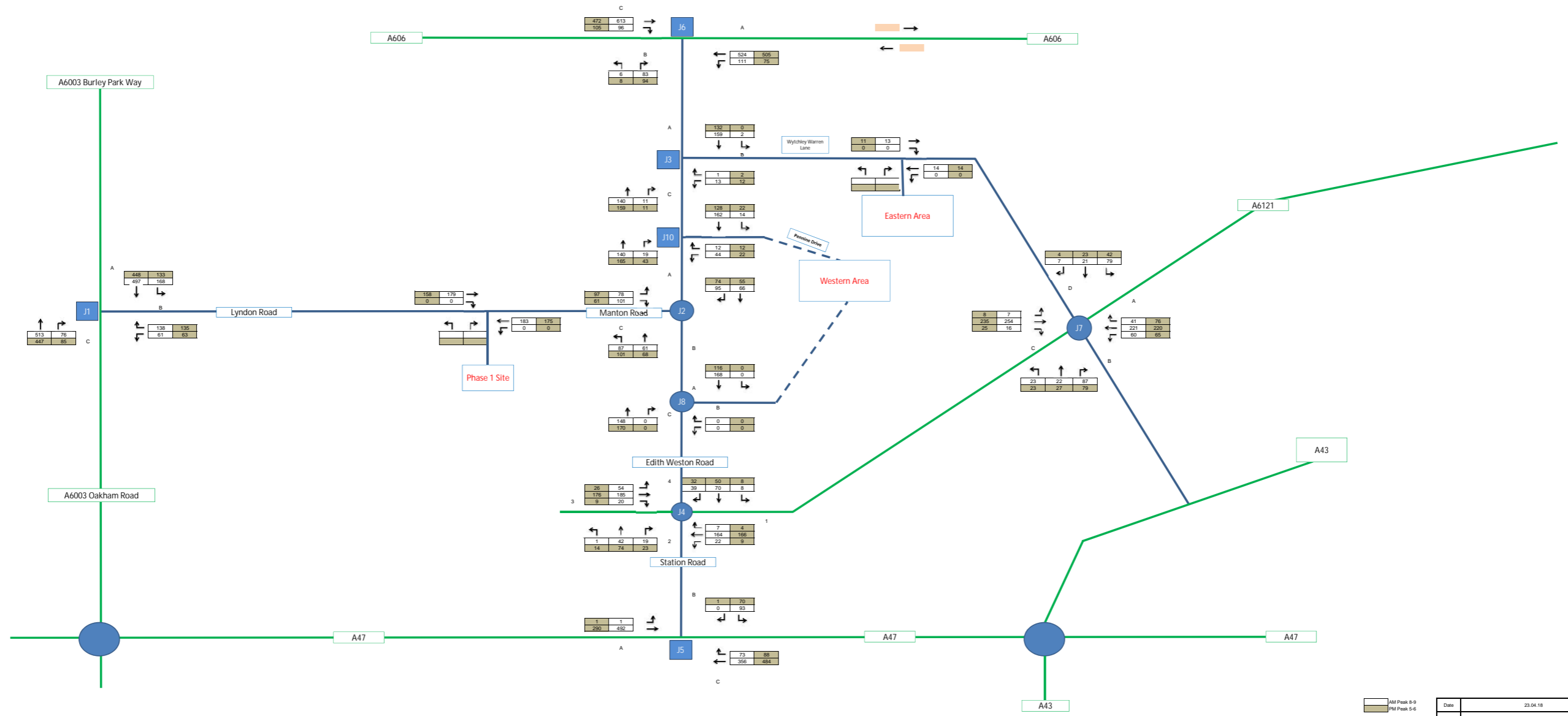


AM Peak 9-9	Date	23.04.18
PM Peak 5-6	Design	MR
	Checked	PF
	Approved	PF

Base 2032 Flows
PCUs

AM	1,1582
PM	1,1788
Avg.	1,1685

NOTES
*An additional 10% growth has been assumed to represent the expected growth patterns on the A606. These have been applied to the mainline flows, not turning flows.



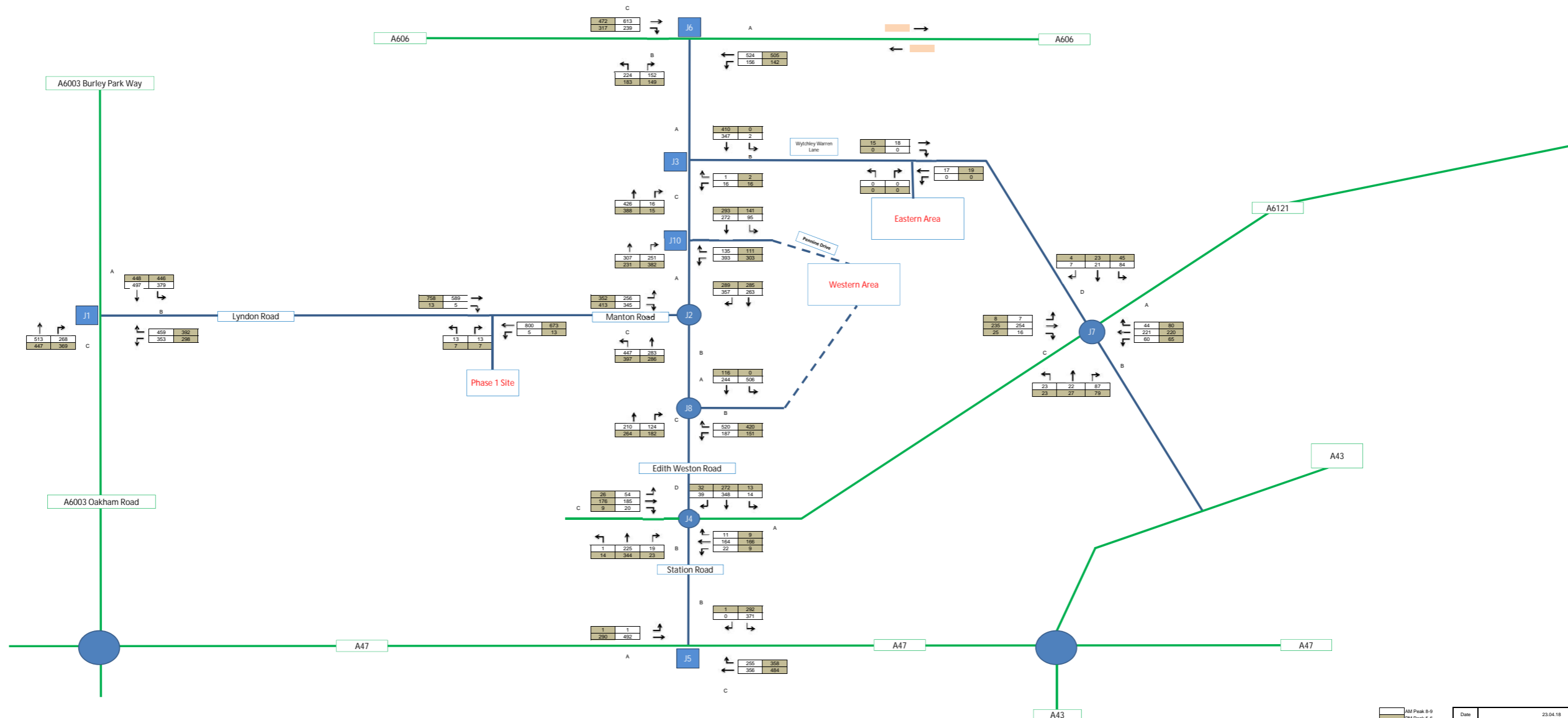
AM Peak 8-9	Date	23.04.18
PM Peak 5-6	Design	MR
	Checked	PF
	Approved	PF

Base 2032 Flows
PCUs

AM	1,1138
PM	1,1232
Avg	1,1185

NOTES

*An additional 10% growth has been assumed to represent the expected growth patterns on the A606. These have been applied to the mainline flows, not turning flows.



AM Peak 8-9
PM Peak 5-6

Date	23.04.18
Design	MR
Checked	PF
Approved	PF

Client: Rutland County Council

Title: Base 2032 + Development



Drawing Number:

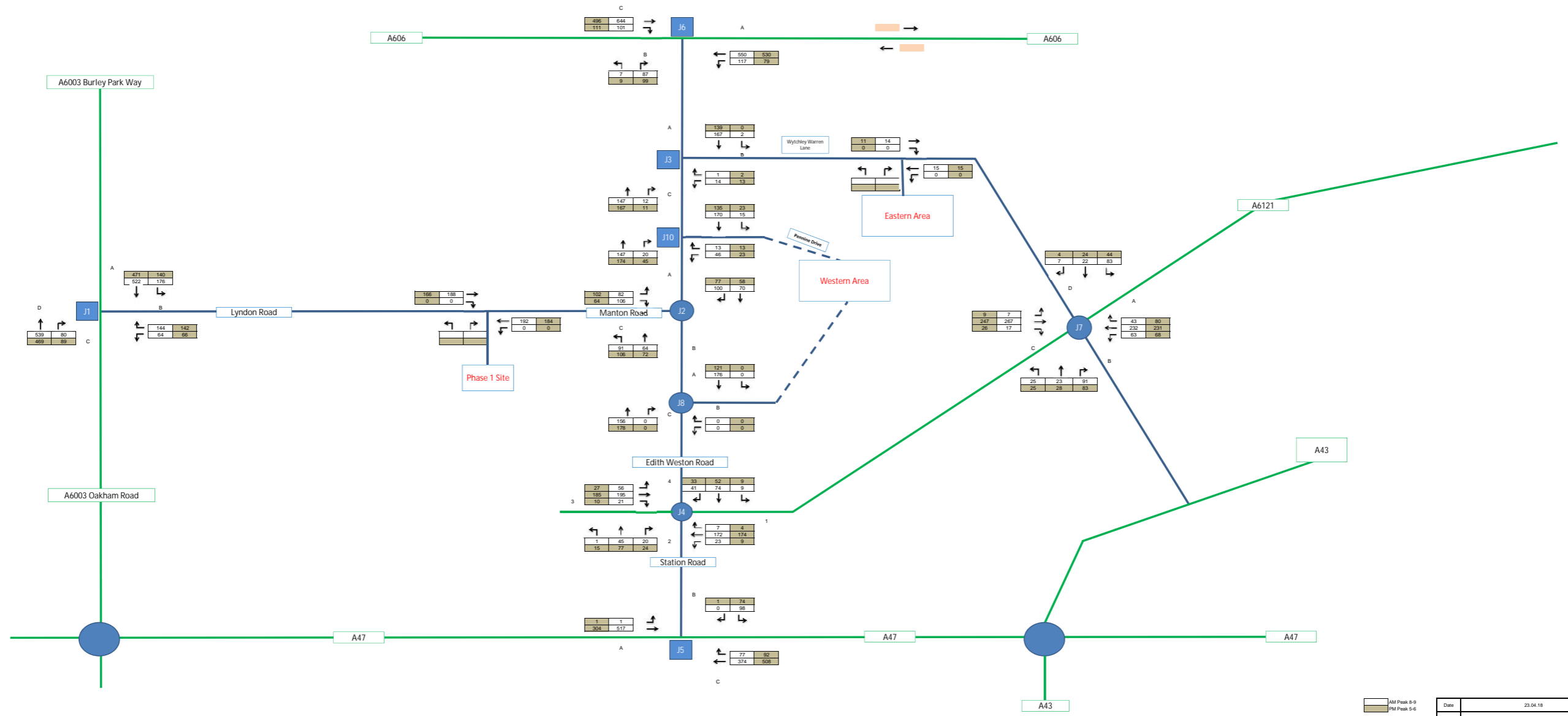
Revision: A

File Path:

Base 2041 Flows
PCUs

AM	1,2135
PM	1,2407
Avg.	1,22719

NOTES
*An additional 10% growth has been assumed to represent the expected growth patterns on the A606. These have been applied to the mainline flows, not turning flows.



AM Peak 8-9	Date	23.04.18
PM Peak 5-6	Design	MR
	Checked	PF
	Approved	PF

Client: Rutland County Council

Title: Base 2041 Flows



Drawing Number:

Revision: A

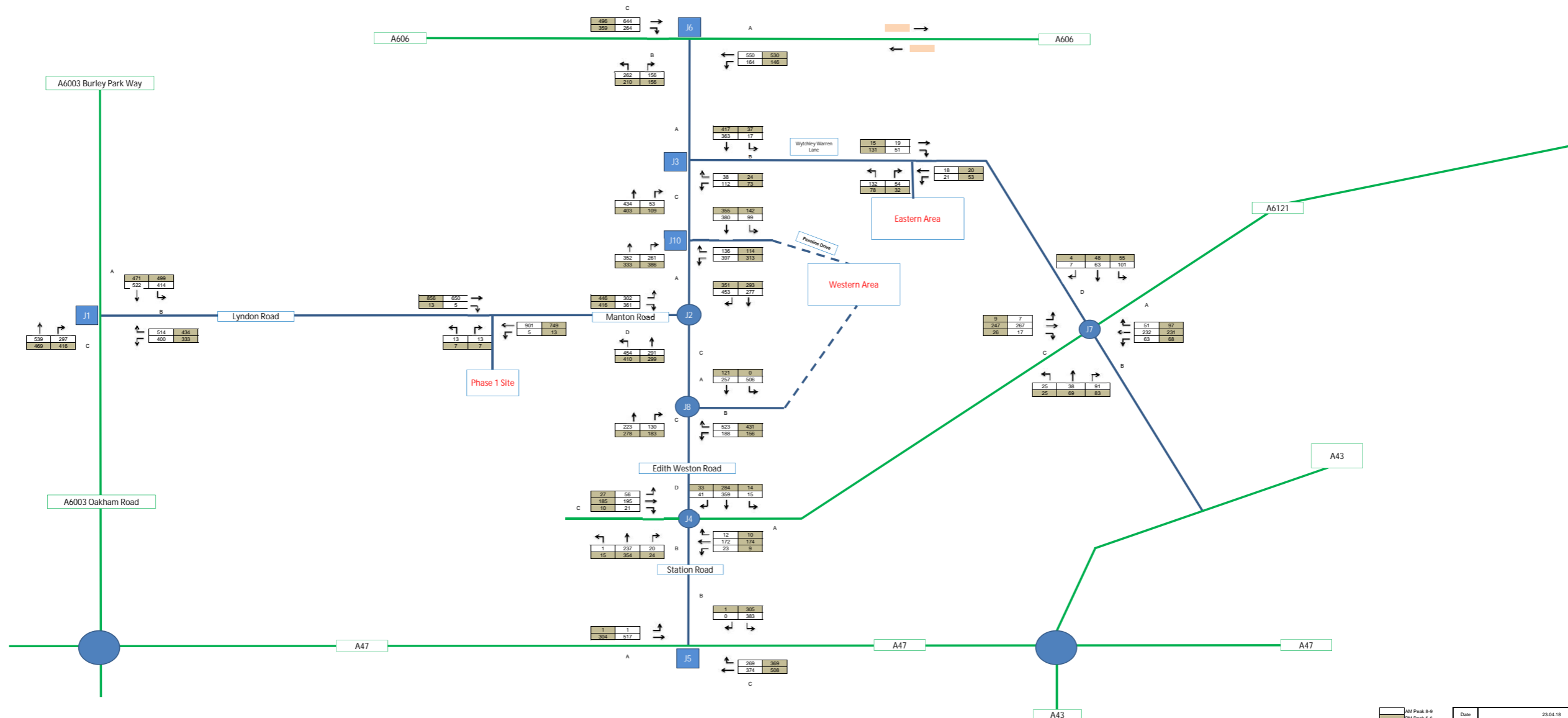
File Path:

Base 2041 Flows
PCUs

AM	1,1138
PM	1,1232
Avg	1,1185

NOTES

*An additional 10% growth has been assumed to represent the expected growth patterns on the A606. These have been applied to the mainline flows, not turning flows.



AM Peak 8-9	PM Peak 5-6
-------------	-------------

Date	23.04.18
Design	MR
Checked	PF
Approved	PF

Client: Rutland County Council

Title: Base 2041 + Development



Drawing Number:

Revision: A

File Path:

2025 BASE		
SITE	AM	PM
A	3715	4176
B	4327	4993
C	1297	1090
D	1293	1115
E	438	425
F	407	588

2025 DEV TRIPS		
SITE	AM	PM
A	25	27
B	27	27
C	0	0
D	52	55
E	32	22
F	9	17

2025 BASE + DEV		
SITE	AM	PM
A	3740	4204
B	4354	5020
C	1297	1090
D	1345	1169
E	470	448
F	416	605

% INCREASE		
SITE	AM	PM
A	1%	1%
B	1%	1%
C	0%	0%
D	4%	5%
E	7%	5%
F	2%	3%

2032 BASE		
SITE	AM	PM
A	3881	4363
B	4521	5216
C	1355	1138
D	1351	1165
E	457	444
F	425	600

2032 DEV TRIPS		
SITE	AM	PM
A	54	60
B	60	62
C	0	0
D	114	122
E	70	50
F	17	39

2032 BASE + DEV		
SITE	AM	PM
A	3935	4423
B	4581	5278
C	1355	1138
D	1465	1286
E	528	494
F	442	639

% INCREASE		
SITE	AM	PM
A	1%	1%
B	1%	1%
C	0%	0%
D	8%	9%
E	13%	10%
F	4%	6%

2041 BASE		
SITE	AM	PM
A	4075	4582
B	4748	5478
C	1423	1195
D	1419	1223
E	480	466
F	447	632

2041 DEV TRIPS		
SITE	AM	PM
A	55	61
B	61	63
C	0	0
D	116	123
E	72	51
F	18	39

2041 BASE + DEV		
SITE	AM	PM
A	4131	4643
B	4808	5540
C	1423	1195
D	1535	1346
E	552	517
F	465	671

% INCREASE		
SITE	AM	PM
A	1%	1%
B	1%	1%
C	0%	0%
D	8%	9%
E	13%	10%
F	4%	6%

Client: Rutland County Council

Title: Junction 10: A606 / A1 - Traffic Flow Percentage Increases



Figure:

Rev:

Drawn:	MR
Chkd:	PF
Appd:	PF

Appendix E Modelling Outputs

Available on request

