Land South of Wixams, Bedford – Wixams End

Baseline Transport Appraisal

Client: Wates Developments

i-Transport Ref: TW/PL/ITB15565-001e

Date: 28 July 2022

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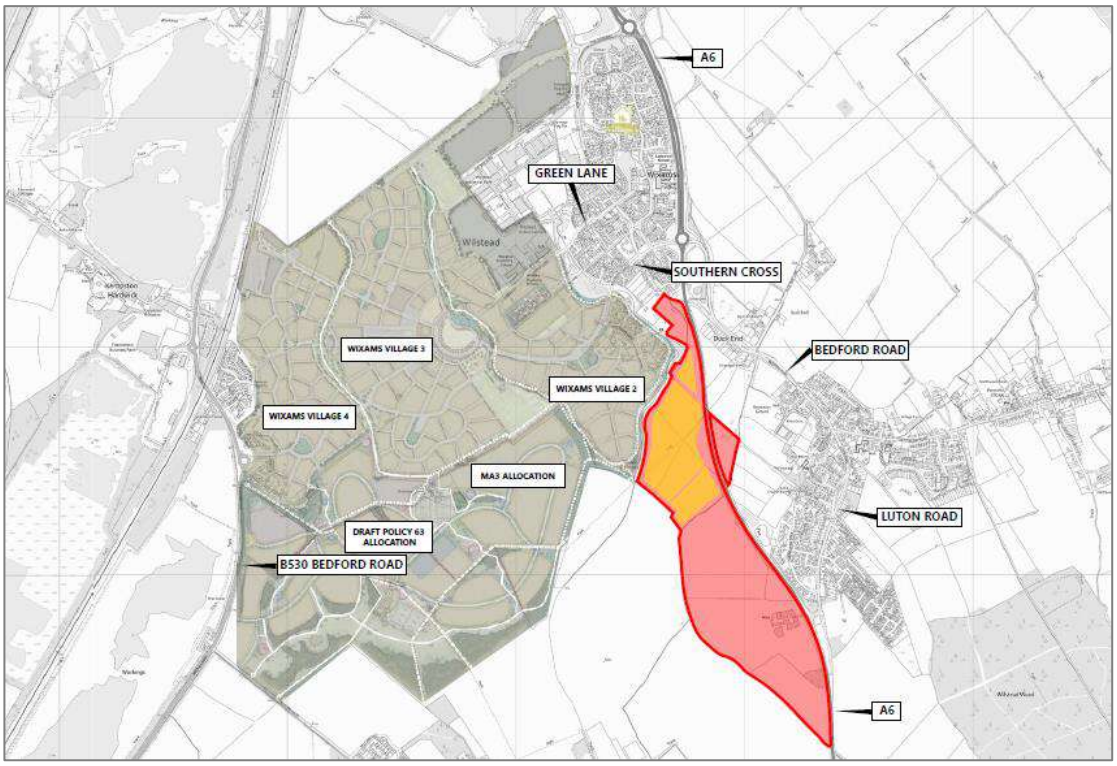
SECTION 1 Introduction

1.1 This report provides a Baseline Transport Appraisal of Land to the South of Wixams, Bedford (Wixams End) which is being promoted for residential development by Wates Developments.

1.2 The site is located to the south-east of Wixams with the A6, with Wilstead Village located to the east of the site, and agricultural land located to the south and west. A new community of 4,500 dwellings and a strategic employment area (36,500m^2) is being delivered at Wixams as part of the Bedford Local Plan on the site of the former Elstow Storage Depot. The site location plan is shown as **Figure 1** (extracted as **Image 1.1**) in its context with the wider Wixams development.

Image 1.1: Site Plan and Context Plan



1.3 The Bedford Borough Council Emerging Local Plan 2040 identifies the Site for development to provide some 300 dwellings. This would form a sustainable extension to Wixams.

1.4 Following a review of the site capacity and constraints, the Site Promoters consider the capacity of the site to be some 430 dwellings, and that this level of development can be satisfactorily achieved on the site. **Image 1.2** (**Appendix G**) presents a Concept Masterplan for the scheme to demonstrate how the land can be brought forward and to show the proposed scheme in the context of the wider consented and completed parts of Wixams.

Image 1.2 – Concept Masterplan

1.5 This appraisal provides an initial assessment of the transport deliverability of the Site against the key tests set out in paragraphs 110 and 111 of the NPPF, i.e.:

- Have appropriate opportunities to promote sustainable transport modes been identified and taken up, given the type of development and its location;
- Can safe and suitable access to the site can be achieved for all users; and
- Can any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, be mitigated to an acceptable degree.

SECTION 2 Sustainable Travel Opportunities

2.1.1 The site is located approximately 1km to the south of the centre of Wixams. It is on the edge of Wixams Villages 1 and 2, and Wilstead village is located circa 700m to the east across the A6.

2.1.2 The Wixams new community is being provided as four villages and will deliver a large range of land uses to serve its population of circa 10,000 people. Village 1 is completed, delivering around 1,000 dwellings, a mixed use local centre, middle school, nursery, creche, village hall and sports facilities. The local centre provides a good range of everyday facilities within ~1km of the Site, a 10-12 minute walk, making key facilities easily accessible by foot and cycle.

2.1.3 In the wider area, there are further facilities, including significant employment, primary and secondary schools, convenience shopping, leisure facilities and healthcare. **Table 2.1** summarises the key facilities close to the site, and travel times to reach each by foot and cycle.

Table 2.1: Summary of Local Facilities

Purpose	Destination	Distance	Walk Time	Cycle Time
Leisure	Portu Gallos Restaurant	1,100	13	4
	Lakeview Village Hall	1,100	13	4
	The Red Lion Pub	1,350	16	5
	The Woolpack Pub	1,400	17	5
	Wilstead Jubilee Centre	1,450	17	5
	Wixam Hatters F.C	1,550	18	6
	Jubilee Playing Fields	1,550	18	6
	Wilstead Bowls Club	1,550	18	6
	Wilstead Park	1,750	21	7
Retail	Budgens	1,100	13	4
	Wilstead Post Office & Stores	1,550	18	6
Employment	Wilstead Industrial Park	1,550	18	6
Education	Lakeview School	1,050	13	4
	Wixamtree Primary	1,300	15	5
	Wixams Academy	1,450	17	5
	Wilstead Lower School	1,550	18	6
Healthcare	Wilstead Pharmacy	1,400	17	5

Source: Consultants Measurements

2.1.4 Walking accounts for around 80% of all journeys up to one mile (1.6km), as well as over 30% of journeys up to two miles (3.2k) *(NTS 2019)*. Average cycle journeys are 3.3 miles (5.3km).

2.1.5 The wider Wixams development (**Figure 2**) is delivering further key facilities including:

- A new Town Centre (Village 3) – 1,850m (~20 minute walk, 7 minute cycle)
- Sports Facilities (Village 2 and 3) – 1,650m – 2,050m (~20 minute walk, 6 minute cycle)
- Strategic Employment Area – 2,350m (<25 minute walk, 10 minute cycle)
- Rail Station – 3,450m (13 minute cycle)

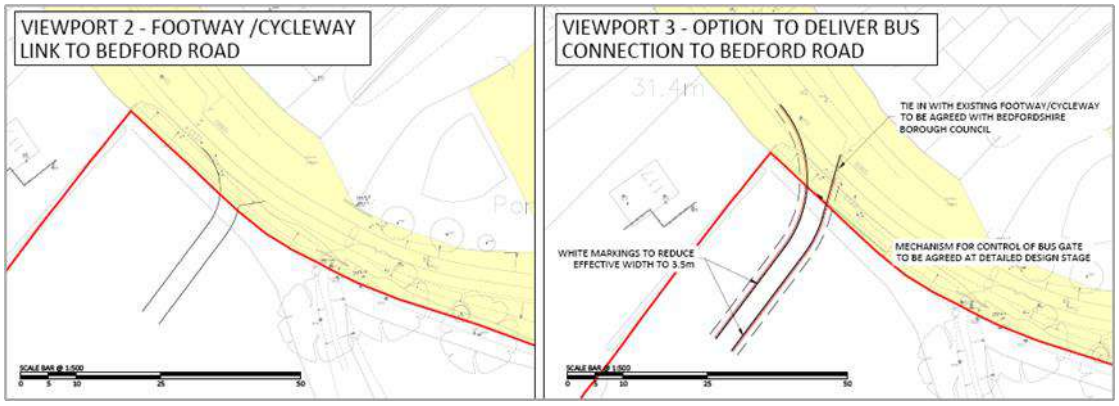
2.1.6 There is good opportunity for the site to deliver sustainable travel outcomes. **Figure 2** presents a walking catchment of 1.6km (i.e. a reasonable walking distance) to demonstrate the accessibility of the site, with all of Wixams and Wilstead falling within a reasonable cycle distance.

2.2 Pedestrian and Cycle Provision

2.2.1 There is an established footway and cycleway network that connects at Bedford Road to the north of the Site, providing continuous off-road lit footways leading north to the Village 1 local centre and providing access to the wider Wixams community.

2.2.2 The site proposes to provide a new dedicated pedestrian/cycle access point to the north of the site to Bedford Road (**Image 2.1**). This access will provide connection to the existing footway network and access to Village 1 of the Wixams development and its associated local facilities, and beyond to wider Wixams and Wilstead. Drawing **ITB15565-GA-001** presents the indicative arrangement of this pedestrian access.

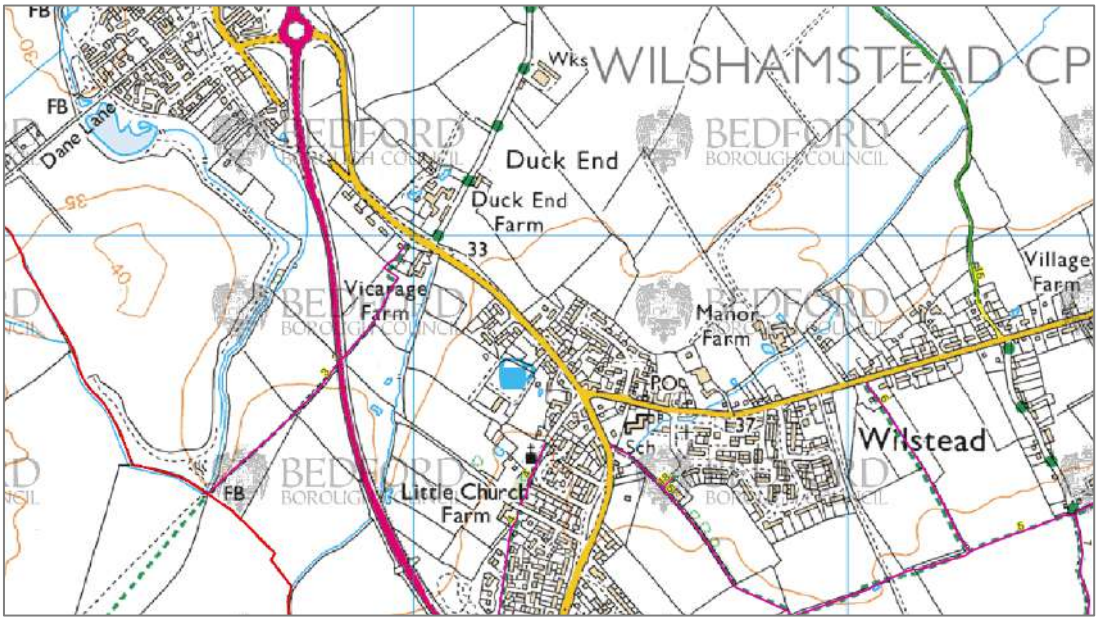
Image 2.1: Non-Motorised Connection to Bedford Road



2.2.3 The connection to Bedford Road will also provide a link to the existing footway to Wilstead village to the east of the A6. This includes a dedicated pedestrian / cycle underpass that travels eastwards under the A6 and a continuous footway provision, with street lighting, to the east of Bedford Road. Wilstead village includes a range of everyday facilities including pharmacy, post office, playing fields and primary school.

2.2.4 A network of Public Rights of Way (PROW) is available within the vicinity of the site, with an extract of the PROW map provided in **Image 2.2**.

Image 2.2: Bedford PROW Map



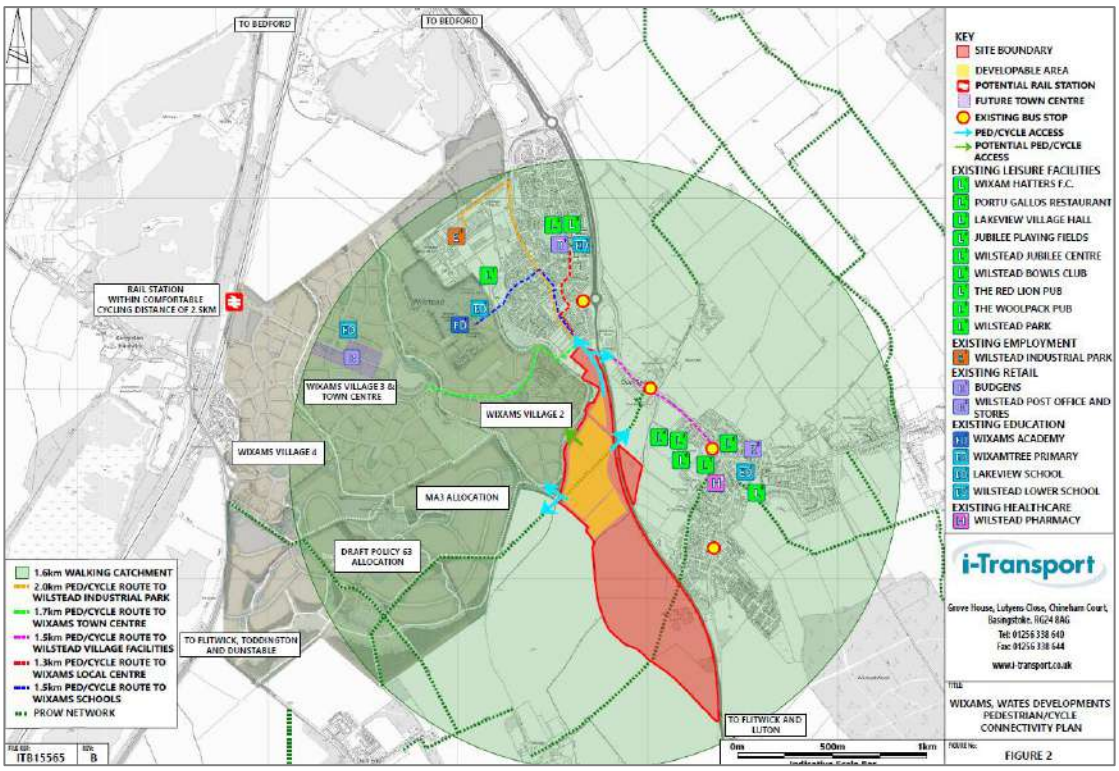
2.2.5 Footpath 3 passes through the site connecting across the A6 to Bedford Road to the north-east and onward towards Wilstead, and eastwards to access the Village 2 network. Direct pedestrian connection is proposed to the west of the site into Village 2 of the Wixams development from Footpath 3. Improvements will be made to Footpath 3 itself (within the site) to ensure the site is well connected to the services and facilities. Village 2 will provide a local centre, which would be ~0.7-1.2km walk from the site, around a 10 minute walk.

2.2.6 Potential pedestrian and cycle connections can also be delivered from the western boundary of the site to Wixams Village 2, connecting to the green ring. This will help community connectivity and provide alternative routing for access to local services and facilities. The Emerging Masterplan (**Appendix G**) safeguards the land needed to provide these future connections.

2.2.7 Footpath 3 also provides a connection between the site and Bedford Road to the east of the A6 at Wilstead. Improvements to enhance the connection across the A6 can be considered as part of the scheme to enhance the attractiveness of the route to Wilstead village should BBC consider this appropriate and desirable.

2.2.8 A pedestrian and cycle connectivity plan, identifying accessibility by sustainable travel to key local facilities is shown in **Image 2.3**. This includes the proposed pedestrian and cycle connection points, walking catchments and key access routes, demonstrating how the site integrates.

Image 2.3: Pedestrian / Cycle Connectivity Plan



2.3 Public Transport Provision

2.3.1 The closest bus stops to the site are located on Southern Cross approximately 250m north of the site, with the whole site falling within 700m of these existing bus stops. Further bus stops are available at Duck End Lane, 450m from the site, east of the A6 towards Wilstead.

2.3.2 **Table 2.2** provides a brief summary of the bus services operating from these bus stops, including key destinations served and frequencies, while **Image 2.4** presents the overall bus network currently operating in the area.

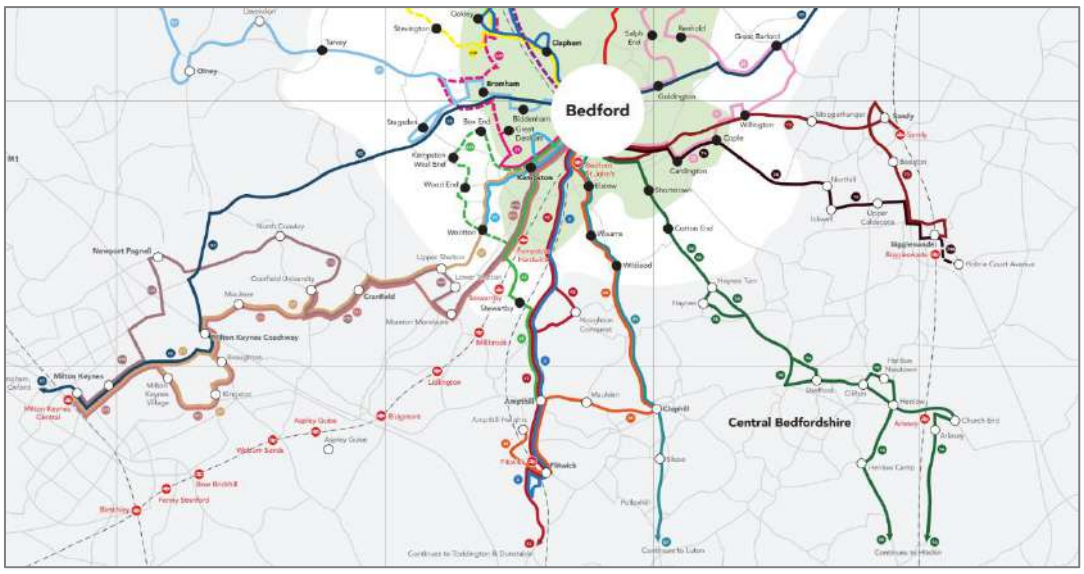
Table 2.2: Summary of Local Bus Services

Service	Route	Mon-Fri	Sat
44	Bedford – Clophill – Ampthill – Flitwick – Ampthill – Ampthill Heights	Hourly service	Hourly service
81	Bedford - Luton	Hourly service	Hourly service

Source: Traveline

2.3.3 The combined services offer half hourly services to Bedford, which is the key higher order settlement in the area, as well as regular connections to Luton and other locally important destinations.

Image 2.4: Bedford Area Bus Map



Source: Bedford Borough Council

2.3.4 As part of the wider Wixams community several new bus routes are planned which will further improve bus accessibility. The site offers the opportunity to develop bus service extensions to integrate the site and to support existing / planned services. Measures to promote bus accessibility will be developed as proposals emerge and the local operators are engaged.

2.3.5 Bedford St Johns is the closest railway station, located some 6.4km to the north of the site. The railway station is accessible by both bus service no. 44 and no. 81. A summary of the rail services at this station are summarised in **Table 2.3**. Other rail opportunities are available at Flitwick, which can be reached via bus service no. 44.

Table 2.3: Summary of Local Rail Services

Destination	Frequency (per hour)		
	Peak	Off Peak	Duration (mins)
Luton	7-8 services per hour	6 services per hour	20 mins
Bletchley	Hourly service	Hourly service	43 mins
Corby	1-2 services per hour*	Hourly service	46 mins
London St Pancras	6-7 services per hour	5-6 services per hour	56 mins
Gatwick Airport	4-7 services per hour	3-4 services per hour	104 mins

Source: National Rail

2.3.6 As part of the new community at Wixams, a new railway station is to be delivered, and it is intended that the station would be operational in 2024, enhancing the accessibility of the area.

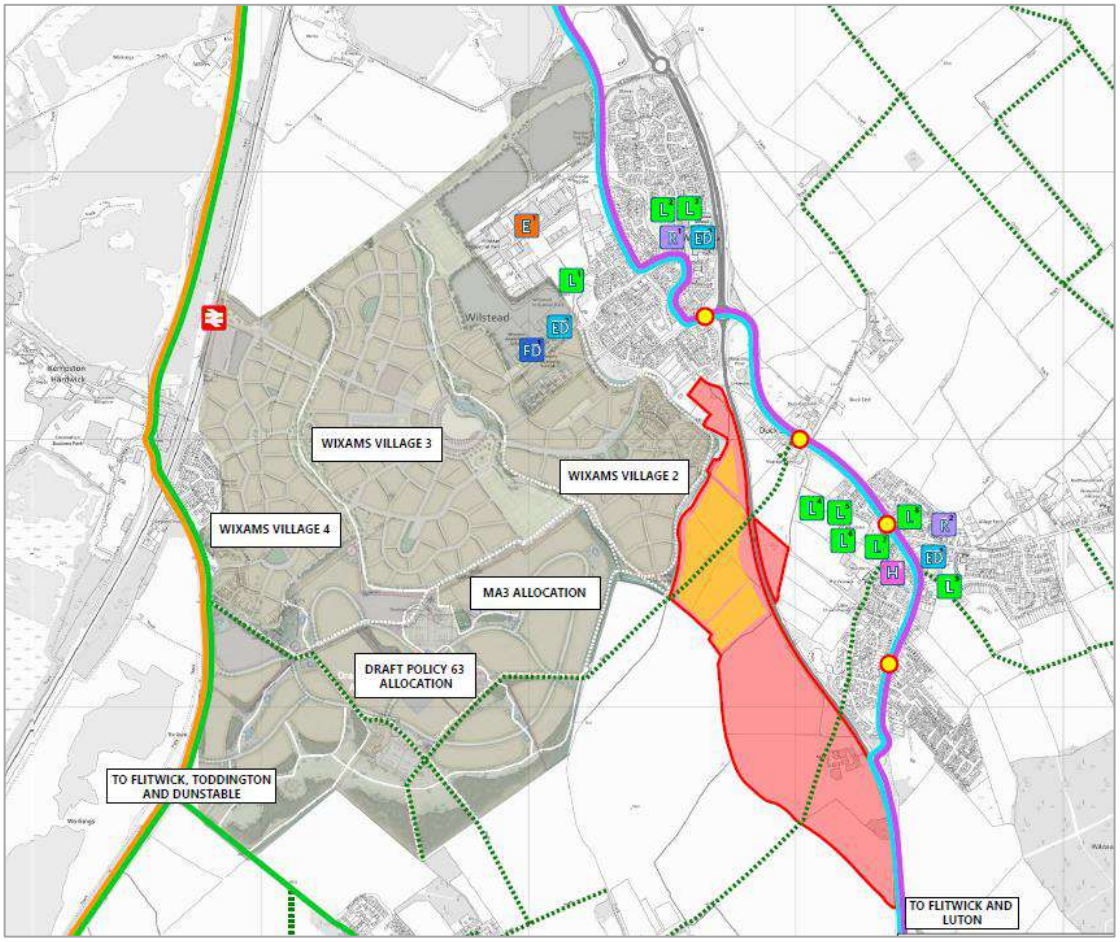
2.3.7 Then new station will be within a comfortable cycling distance of the Site.

2.4 Promotion of Sustainable Transport

2.4.1 The site is well served by local bus routes and is well positioned with regard to the local facilities and services being delivered as part of the wider Wixams proposals. There are good locational opportunities for travel to be promoted by sustainable travel modes, including walking, cycling and public transport.

2.4.2 **Figure 2**, an extract of which is shown as **Image 2.5**, illustrates that there is a very good variety of local services and amenities within the vicinity of the site.

Image 2.5: Accessibility Plan



Source: Figure 2

2.4.3 To ensure opportunities to promote the uptake of sustainable transport modes are taken up, a series of measures will be delivered as part of a Sustainable Transport Strategy for the site. The detail of the strategy will be worked up as the proposals emerge and through liaison with the Council and local transport operators. The principles of this strategy are outlined in **Table 2.4**.

Table 2.4 – Sustainable Transport Strategy Principles

Category	Measures
Encouragement of Walking and Cycling	• Delivery of walking / cycling connections to Bedford Road and Wixams Village 2 and improvement to Footpath 3 • Information on walking and cycling routes and facilities within the area to be provided to residents through a resident's travel information pack • Setting up of a bicycle user group • Negotiation of discounts or promotions for residents at local cycle stores • Creation of well-designed and safe walking and cycling routes within the site
Encouragement of the use of Public Transport	• Information on the public transport routes and facilities made available through the resident's travel information pack • Promotion of new bus routes planned within Wixams and any service extensions to integrate the site to such services • The promotion railway services available at Bedford St Johns / Flitwick and the Wixams Station when opened • Bus stop improvements
Measures to encourage Car-Sharing	• Car sharing to be promoted amongst new residents of the development – particularly in relation to journeys to work • Viability of a Car Club to be considered
Information Provision and Travel Marketing	• Provision of a resident's travel information pack including promotional material, travel discounts, travel information • Details regarding the provision of broadband access – to enable easy access to local home delivery services and home-working • A plan of the development, highlighting nearby local facilities and services and the walking and cycling routes to these locations • Details of cycle training schemes, bus and train timetables and information on journey planning services

2.5 Accessibility Summary

2.5.1 The site is well located to local facilities and services being delivered as part of Wixams and would form a natural, well integrated, and cohesive extension to Wixams.

2.5.2 The site benefits from the potential for direct connections to established walking and cycling networks. Opportunities to access public transport are available close to the site.

2.5.3 Therefore, the site will be well integrated and will offer good opportunities to promote sustainable transport. A Sustainable Transport Strategy will be delivered to ensure opportunities for sustainable movement are taken up.

SECTION 3 Site Access Strategy

3.1 Wider Wixams Settlement

3.1.1 The access strategy adopted for the wider Wixams settlement comprised the upgrading and re-alignment of the A6, creating a dual carriageway section of road for some 2.5km south of the A421. The A421 is a trunk road between the A1 and M1, administered by Highways England. The old A6 is now provided as a pedestrian / cycle route to Wilstead.

3.1.2 Whilst the A6 is a county road (having been de-Trunked), it remains an important connection between Bedford and Luton. The junction of the A6 / A421 has also been improved recently.

3.1.3 Two 70m ICD roundabouts are provided as the northern and southern gateways to Wixams at 'Southern Cross' and 'The Causeway', from which the new community is served by an interconnecting network of streets.

3.2 Access Strategy

Vehicular Access

3.2.1 In view of the established access strategy for the wider Wixams development, any access to the site will need to ensure that it does not cause any significant impact on the strategic flow of traffic on the A6. The proposed access strategy comprises:

- Vehicular access to the A6, mirroring the agreed approach for the remainder of Wixams through the delivery of a new 'normal' roundabout to serve the Site;
- Pedestrian / Cycle / Emergency Vehicle access to Bedford Road; and
- Pedestrian connections to the PROW network.

3.2.2 To achieve access to the A6, agreement will be required from BBC and it will need to be designed to reduce potential impacts of increased delay on the wider highway network.

3.2.3 A traffic signal junction would be likely to create additional delays to A6 traffic and a simple priority junction would not deliver sufficient capacity to safely serve the site.

3.2.4 On this basis, it is proposed that the site will be served by a new 'normal' roundabout junction to the A6. This is consistent with the form of junction that serves the wider Wixams community and generally maintains the free flow of traffic on the wider A6.

3.2.5 Highway boundary data has been obtained from BBC to determine the extent of the public highway for the design of the access roundabout which is provided in **Appendix A**.

3.2.6 **Image 3.1** presents the proposed access comprising of a new three arm roundabout to the A6 (**Drawing ITB15565-GA-001)** which has been designed in accordance with DMRB Standards.

Image 3.1 – A6 Access Roundabout

Source: Drawing ITB15565-GA-001

3.2.7 The proposed access roundabout comprises:

- A 60m ICD roundabout – whilst the two existing roundabout to the A6 serving Wixams are slightly larger (70m ICD), this section of the A6 is single carriageway rather than dual;
- Two lane entries on each arm of the junction, to facilitate turning movements into the site, but also to maintain the free-flow of the A6 traffic across the junction;
- Forward visibility of 215m on A6 approaches, consistent with the existing speed limit;
- Entry path deflection of <100m; and
- Forward visibility of 43m on the site access arm, consistent with a 30mph design speed, the same as the Wixams accesses.

3.2.8 The design conforms to all design standards (DMRB) and can be achieved either within land controlled by the promoters of the site, or the public highway.

3.2.9 An initial appraisal of the operation of the site access junction has been carried using the traffic flow profiles agreed for the Wixams development and which account for the latest committed developments, as well as recently collected traffic data, considering future conditions in 2040, consistent with the end of the Local Plan. **Table 3.1** presents the assessment of the junction which considers 300 dwellings, whilst **Table 3.2** presents an assessment of 430 dwellings.

Table 3.1 – Proposed A6 Access – 2040 Future Year – 300 Dwellings

Arm	AM Peak Hour				PM Peak Hour			
	RFC	Queue (veh)	Delay (s/veh)	LOS	RFC	Queue (veh)	Delay (s/veh)	LOS
A6 (North)	0.48	<1	4	A	0.66	2	6	A
A6 (South)	0.55	1	5	A	0.58	1	5	A
Site Access	0.11	<1	3	A	0.05	0	3	A

Table 3.2 – Proposed A6 Access – 2040 Future Year – 430 Dwellings

Arm	AM Peak Hour				PM Peak Hour			
	RFC	Queue (veh)	Delay (s/veh)	LOS	RFC	Queue (veh)	Delay (s/veh)	LOS
A6 (North)	0.49	1	4	A	0.69	2	6	A
A6 (South)	0.55	1	5	A	0.60	2	5	A
Site Access	0.16	<1	3	A	0.06	<1	3	A

3.2.10 The proposed junction will operate wholly within capacity under 'Free Flow' conditions, with no material queueing or delay under either the 300 or 430 dwelling scenarios. Each arm of the junction demonstrates a 'Level of Service' category 'A', the highest category of performance. Delays on each approach are inconsequential and no material queueing is projected.

Pedestrian Access

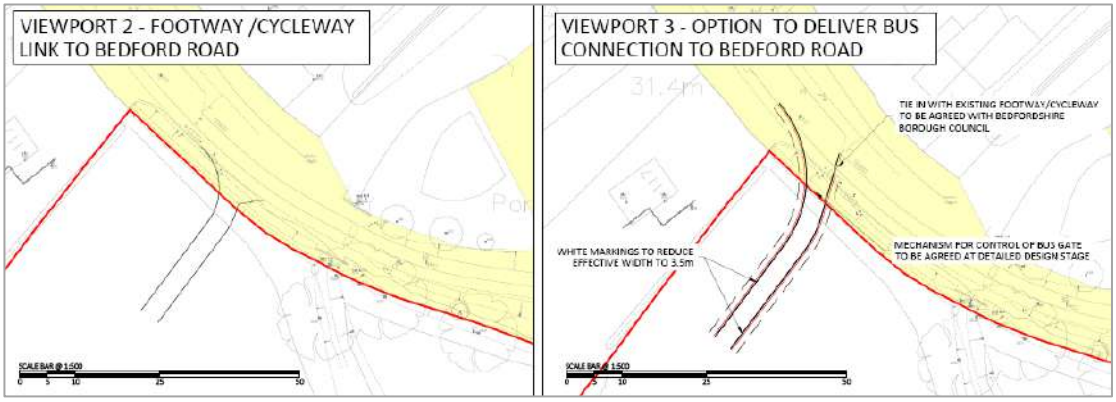
3.2.11 No footways are present on the A6 within the vicinity of the site. Given the strategic nature of the A6, provisions for pedestrians / cyclists along the A6 between the site and Southern Cross are undesirable.

3.2.12 As a result, non-motorised connections are directed to Bedford Road, located to the north of the site, and to the west to Wixams Village 2 from Footpath 3.

3.2.13 Bedford Road is a single lane two-way cul-de-sac some 5.5m in width and is subject to a 30mph speed limit along the site frontage. 2m wide footways are present on both sides of the carriageway. At its northern end, i.e. at its junction with Southern Cross, a 3m wide shared footway / cycleway is present on the southern side of Southern Cross and provides a connection westbound to Village 2. At its southern end, adjacent to the site boundary, a dedicated traffic free segregated pedestrian footway / cycleway some 5m in width is present on Bedford Road and provides a connection directly to Bedford Road in Duck End, and onwards to Wilstead.

3.2.14 Consideration has been given to the provision of either a dedicated shared footway / cycleway and / or a 'Bus Only' connection on to Bedford Road. **Drawing ITB15656-GA-001** presents both indicative arrangements, an extract of which is shown at **Image 3.2**. This would also double as an emergency vehicle access.

Image 3.2: Indicative Non-Motorised Connection to Bedford Road



Source: Consultant

3.3 Access Summary

3.3.1 Whilst access arrangement will be subject to discussions and agreement with the highway officers at Bedford Borough Council in due course, it is demonstrated that safe and suitable access for all users can be achieved to the site.

3.3.2 The proposed vehicular access can be delivered in line with design standards and initial traffic assessment confirms that it would operate efficiently, in free-flow conditions.

3.3.3 Non-vehicular access is provided on key desire lines north to Wixams 1 via Bedford Road, west to wider Wixams from Footpath 3 and Bedford Road and to Wilstead from Bedford Road. There is potential for future bus connections to be facilitated through the scheme if desirable.

SECTION 4 Traffic Impact

4.1.1 This section of the Appraisal considers the high-level traffic impacts that may arise from the development of the Site and considers the ability of the local network to accommodate the site.

4.2 Baseline Traffic Flows and Growth

4.2.1 To inform this initial assessment, a suite of traffic surveys were collected on the local network, focussed on the junctions of the A6 corridor. These comprised manual classified turning counts (with queue survey), at the following locations:

- MCC 1 – A6 Roundabout (West of Wilstead Road)
- MCC 2 – A6 Roundabout (East of The Causeway)
- MCC 3 – A6 Roundabout (East of Southern Cross)
- MCC 4 – A6 / Luton Road Junction
- MCC 5 – Clophill Roundabout
- MCC 6 – A421 / A6 junction

4.2.2 To account for traffic growth, between the 2022 surveys and the End of Local Plan period (2040), an unadjusted TEMPRO growth rate was applied. Review of the TEMPRO assessments identifies that the forecasts include the delivery of some 1,100 dwellings in this period within Wixams, as well as employment growth.

4.2.3 A review of the BCC Trajectory Topic Paper (April 2022), identifies that, as of March 2021, there were unbuilt consents in place for some 1,400 dwellings in Wixams.

4.2.4 Allowing for further completions that will have occurred since March 2021 and taking account of the development proposal on this site (400/430 dwellings), the TEMPRO growth factors are shown to include an appropriate level of growth to consider the impact of the scheme cumulatively with other local development. These assumptions would be confirmed with the Highway Authority leading to a planning application and when the Spatial Strategy is confirmed.

4.3 Traffic Generation

4.3.1 To determine the likely traffic generation for a development of circa 300 / 430 dwellings, vehicle trip rates were extracted from the TRICS database.

4.3.2 The following parameters were utilised:

- **Region -** Sites in England (excluding Greater London);
- **Size Relevance –** Sites between 250 and 550 homes;
- **Time Period –** Surveys dated for the last seven years;
- **Location Relevance –** Surveys in 'Suburban' and 'Edge of Town' locations; and
- **Date Relevance –** Surveys undertaken on weekdays only.

4.3.3 The extracted TRICs trip rates and associated vehicle trips for are summarised in **Table 4.1**. The full TRICS output report is contained at **Appendix B**.

Table 4.1: Proposed Residential Traffic Generation – Vehicles (415 Dwellings)

	Morning Peak Hour (0800-0900)			Evening Peak Hour (1700-1800)		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
Trip Rate - Vehicles	0.135	0.415	0.550	0.383	0.170	0.553
Trips – 430 dwellings	58	178	237	165	73	238
Trips – 300 dwellings	41	125	165	115	51	166

Source: TRICS Database and Consultant's calculations

4.3.4 The data in **Table 4.1** indicates that a development of circa 430 dwellings at the site will likely generate around 240 two-way vehicle movements in both the morning and evening peak periods. This equates to circa three to four vehicle movements per minute and is consistent with the traffic generation estimates of the initial Wixams appraisal.

4.3.5 A development of 300 dwellings on the Site would generate some 160-170 vehicle movements in peak hours, some 3 each minute.

4.3.6 The Wixams assessment concluded that 40% of vehicle trips would be 'contained' to Wixams itself and not travel outside of the town. This same assumption has been applied in this appraisal.

4.4 Traffic Distribution

4.4.1 The Wixams traffic estimates suggested that some 80% of external traffic demand (that not contained to Wixams) is expected to route north towards the A421, Bedford and beyond, with the remaining 20% of traffic expected to route south.

4.4.2 These estimates were sense checked through the development of a traffic distribution model, comprising Journey to Work data (extracted from the 2011 Census) and a P/T^2 gravity model.

Journey Purpose

4.4.3 The likely journey purpose for the generated car driver peak hour trips has been determined using data derived from the NTS 2019 (DfT). The proportion of the peak hour trips by journey purpose by car is presented in **Table 4.2**.

Table 4.2: Proportion of Peak Hour Trips by Journey Purpose (Car Driver Only)

Trip Purpose	Morning Peak Hour	Evening Peak Hour
Commuting/ Business	36.8%	43.2%
All Other Journey Purposes	63.2%	56.8%
Total	**100%**	**100%**

Source: Car driver trip start time by trip purpose (Monday to Friday only): Great Britain 2015/2019, National Travel Survey, DfT, 2019

4.4.4 The NTS 2019 data has been used to distribute the development generated traffic. The analysis has been undertaken on the basis that 43.2% of vehicular trips generated by the development will be for employment journeys and the remaining 56.8% of vehicle journeys will be for other purposes for both the morning and evening peak hours. These proportions are derived from National Travel Survey data.

Commuting Journeys

4.4.5 Journey to Work data contained within the 2011 Census has been reviewed for the local area to identify the likely destinations for employment journeys. The analysis is summarised in **Table 4.3** and presented in full in **Appendix C**.

Table 4.3: Summary of Employment Trips Distribution (Travel by Car)

Destination	Percentage of Trips to Work	Percentage of All Trips
Luton	9.0%	3.9%
Milton Keynes	6.5%	2.8%
Sandy	2.6%	1.1%
Biggleswade	0.9%	0.4%
Cranfield	2.4%	1.0%
Ampthill	3.7%	1.6%
Marston Moretaine	0.6%	0.3%
Shefford	3.4%	1.5%
Flitwick	1.5%	0.7%
Harlington	1.2%	0.5%
Bedford	59.1%	25.5%
Huntingdon	0.9%	0.4%
Hemel Hempstead	0.4%	0.2%
Hitchin	1.1%	0.5%
Stevenage	0.9%	0.4%
Northampton	0.5%	0.2%
Shortstown	5.3%	2.3%
Total	**100.0%**	**43.2%**

Source: Census 2011

Non-employment Journeys

4.4.6 The distribution of non-employment trips has been estimated using a bespoke P/T^2 gravity model. This considers destinations within a 30-minute drive time of the site to reflect the more local nature of the likely destinations of these non-work related trips.

4.4.7 The population of key urban areas (likely destinations for non-employment trips) has been estimated from the 2011 Census. Journey times were then estimated using Journey planning software from the Google Maps Directions facility, based on peak hour journey times.

4.4.8 A summary of the distribution of trips for non-employment journey purposes by destination is presented in **Table 4.4**. The gravity model is presented in full in **Appendix C**.

Table 4.4: Distribution of Other Journey Purposes (Car Drivers Only)

Destination	Percentage of Trips for Non-employment Purposes	Percentage of All Trips
Bedford	26.9%	15.3%
Biggleswade	1.6%	0.9%
Flitwick	2.5%	1.4%
Luton	22.1%	12.6%
Milton Keynes	26.3%	14.9%
Shortstown	2.9%	1.6%
Shefford	2.7%	1.5%
Wilstead	10.5%	6.0%
Ampthill	4.5%	2.6%
Total	**100.0%**	**56.8%**

Combined Distribution

4.4.9 The traffic distribution associated with the employment and non-employment trips have been combined and the overall traffic distributions for the development traffic are summarised in **Table 4.5** and presented in full in **Appendix C**.

Table 4.5: Combined Distribution (Car Drivers Only)- Key External Destinations Only

Destination	Percentage of all Trips - Work	Percentage of all Trips – Non-work	Percentage of all Trips
Bedford	25.5%	15.3%	40.8%
Milton Keynes	2.8%	14.9%	17.7%
Luton	3.9%	12.6%	16.5%
Wiltstead	-	6.0%	6.0%
Ampthill	1.6%	2.6%	4.2%
Shortstown	2.3%	1.6%	3.9%
Shefford	1.5%	1.5%	3.0%
Flitwick	0.7%	1.4%	2.1%
Biggleswade	0.4%	0.9%	1.3%
Sandy	1.1%	-	1.1%
Cranfield	1.0%	-	1.0%
Harlington	0.5%	-	0.5%
Hitchin	0.5%	-	0.5%
Stevenage	0.4%	-	0.4%
Others	0.4%	-	0.4%
Marston Moretaine	0.3%	-	0.3%
Total	**43.2%**	**56.8%**	**100.0%**

4.4.10 The traffic expected to be generated by the potential residential development at the site (ref: **Table 4.1**) has been distributed across the local highway network to the destinations summarised in **Table 4.5** and identified fully in **Appendix C**.

4.4.11 To determine the routing of trips to these destinations, reference has been made to the Google Maps 'Directions' facility. A morning peak hour start time for journeys was utilised to ensure that peak period traffic conditions were reflected. **Table 4.6** summarises the assignment of trips.

Table 4.6: Summary of Traffic Assignment

Decision Points	Route Choice	Percentage of Routing
1 (Site Access)	A6 (North)	74.3%
	A6 (South)	25.7%
Total		**100.0%**
2	A6 (North)	39.8%
	A6 (South)	9.9%
	A421 (West)	29.1%
	A421 (East)	3.2%
	Bedford Road (East)	2.1%
	Luton Road	5.4%
	A507 (West)	0.3%
	A507 (East)	2.5%
	-	7.7%
Total		**74.3%**

Source: Consultant's Calculations

4.4.12 The detailed distribution analysis supports the initial Wixams traffic distribution, with circa 75% of traffic likely to travel north to the A421, Bedford and beyond and circa 25% to route south.

4.5 Traffic Impacts – 430 Dwelling Scheme

4.5.1 **Appendix E** presents a traffic flow diagram showing the expected development trips associated with a scheme of 430 dwellings, and **Table 4.7** and **4.8** demonstrate the network impacts that are expected to arise from the development on road links and on the key A6 junctions.

Table 4.7: Development Impact Assessment – Link Impacts (430 Dwellings)

Links	Period	2040 Without Development	Development Trips	% Increase
A6 North of A421	AM Peak	2,758	57	2.0%
	PM Peak	2,718	57	2.1%
A421 East (Slips)	AM Peak	1,261	4	0.4%
	PM Peak	1,432	5	0.3%
A6 South of A421	AM Peak	2,636	102	3.9%
	PM Peak	2,800	103	3.7%
A421 West (Slips)	AM Peak	2,120	41	2.0%
	PM Peak	2,095	42	2.0%
A6 North of The Causeway	AM Peak	2,797	102	3.7%
	PM Peak	2,474	103	4.2%
A6 South of The Causeway	AM Peak	2,118	138	6.5%
	PM Peak	2,284	138	6.1%
The Causeway	AM Peak	858	35	4.1%
	PM Peak	746	35	4.8%
Luton Road	AM Peak	161	13	7.9%
	PM Peak	223	13	5.8%
A6 South of Luton Road	AM Peak	1,771	48	2.7%
	PM Peak	2,057	48	2.3%

Table 4.8: Development Impact Assessment - Junction Impacts (430 Dwellings)

Junctions	Period	2040 Without Development	Development Trips	% Increase
A421 / A6 Roundabout	AM Peak	4,523	102	2.3%
	PM Peak	4,639	103	2.2%
The Causeway Roundabout	AM Peak	2,887	138	4.8%
	PM Peak	2,919	138	4.7%
A6 / Luton Road Junction	AM Peak	1,779	61	3.4%
	PM Peak	2,093	61	2.9%

Source: Consultant's Calculations

4.5.2 Overall, the development would be expected to increase traffic flows to the north of Wixams on the A6 by some 3.7-4.2% and by around 2.3-2.7% to the south of Wixams. In real terms, this equates to an average of 1-2 additional vehicle movements every minute on the A6 north of Wixams in peak hours, and under one additional vehicle every minute south of Wixams.

4.5.3 At the key junctions on the corridor, impacts are similarly limited, adding some 2% to traffic demands at the A6 / A421 junction and 3-5% to junctions on the wider A6 corridor.

4.5.4 These increases in traffic are not significant and will not be likely to have a material impact on the operation of the local highway network.

4.6 Traffic Impacts – 300 Dwelling Scheme

4.6.1 **Appendix F** presents a traffic flow diagram showing the expected development trips associated with a scheme of 300 dwellings, and **Table 4.9** and **4.10** demonstrate the network impacts that are expected to arise from the development on road links and on the key A6 junctions.

Table 4.9: Development Impact Assessment – Link Impacts (300 Dwellings)

Links	Period	2040 Without Development	Development Trips	% Increase
A6 North of A421	AM Peak	2,758	39	1.4%
	PM Peak	2,718	40	1.5%
A421 East (Slips)	AM Peak	1,261	3	0.2%
	PM Peak	1,432	3	0.2%
A6 South of A421	AM Peak	2,636	71	2.7%
	PM Peak	2,800	72	2.6%
A421 West (Slips)	AM Peak	2,120	29	1.4%
	PM Peak	2,095	29	1.4%
A6 North of The Causeway	AM Peak	2,797	71	2.6%
	PM Peak	2,474	72	2.9%
A6 South of The Causeway	AM Peak	2,118	96	4.5%
	PM Peak	2,284	97	4.2%
The Causeway	AM Peak	858	25	2.9%
	PM Peak	746	25	3.3%
Luton Road	AM Peak	161	9	5.5%
	PM Peak	223	9	4.0%
A6 South of Luton Road	AM Peak	1,771	33	1.9%
	PM Peak	2,057	34	1.6%

4.6.2 Overall, the development would be expected to increase traffic flows to the north of Wixams on the A6 by some 2.6-2.9% and by around 1.6-1.9% to the south of Wixams. In real terms, this equates to an average of around 1 additional vehicle movements on the A6 north of Wixams in the morning and evening peaks, and one additional vehicle every two minutes south of Wixams.

Table 4.10: Development Impacts – Junction Impacts (300 Dwellings)

Junctions	Period	2040 Without Development	Development Trips	% Increase
A421 / A6 Roundabout	AM Peak	4,523	71	1.6%
	PM Peak	4,639	72	1.5%
The Causeway Roundabout	AM Peak	2,887	96	3.3%
	PM Peak	2,919	97	3.3%
A6 / Luton Road Junction	AM Peak	1,779	42	2.4%
	PM Peak	2,093	43	2.0%

Source: Consultant's Calculations

4.6.3 At the key junctions on the corridor, impacts are similarly limited, adding some 1.6% to traffic demands at the A6 / A421 junction and 2-3% to junctions on the wider A6 corridor.

4.6.4 These increases in traffic are not significant and will not be likely to have a material impact on the operation of the local highway network.

4.7 Corridor Capacity Assessment

4.7.1 In due course, detailed traffic assessment of the key A6 corridor junctions will be carried out, in dialogue with BBC and in line with an agreed scope of assessment.

4.7.2 To consider the performance of junctions on the corridor as part of this initial assessment, recent junction capacity analysis undertaken to support the Employment Quarter in Wixams (prepared by Mode) has been reviewed to determine existing network operation. This considered the cumulative impact of growth in the area including particularly the delivery of Wixams.

A6 (North) / Bus Gate / A6 (South) / The Causeway Roundabout

4.7.3 The junction capacity analysis indicates that the roundabout is likely to operate well within capacity during the future year scenarios, in both the morning and evening peak periods with RFC values of 0.46 and 0.34 on the worst performing arms. Queuing of one vehicle on approaches is projected.

4.7.4 The residential development of Land South of Wixams, which would increase traffic demands by 3-4%, adding less than two vehicles each minute to the junction and some 2-3% of traffic flows to the junction, will not materially impact on the operation of the junction.

Approach	AM Peak Hour (08:00 - 09:00)		PM Peak Hour (17:00 – 18:00)	
	Queue (Veh)	RFC	Queue (Veh)	RFC
2023 Future Baseline + Committed Development				
The Causeway	1	0.43	1	0.35
Old A6 (S)	1	0.28	1	0.24
Northern Distributor Road	1	0.18	1	0.19
Old A6 (N) – Bus Gate	1	0.05	0	0.01
2023 Future Baseline + Committed Development + Proposed Development				
The Causeway	1	0.46	1	0.34
Old A6 (S)	1	0.29	1	0.24
Northern Distributor Road	1	0.20	1	0.21
Old A6 (N) – Bus Gate	1	0.05	0	0.01

Source: Table 5.4 of TA submitted in support of EQ development (prepared by Mode)

A6 / The Causeway Roundabout

4.7.5 The junction capacity analysis indicates that the roundabout is likely to operate well within capacity during the future year scenarios, in both the morning and evening peak periods with RFC values well below 0.85, being 0.71 and 0.8, with queues of 2-3 vehicles.

4.7.6 The traffic associated with the residential development would not materially alter the operation of the junction, adding some 1-2 vehicles each minute.

Approach	AM Peak Hour (08:00 - 09:00)		PM Peak Hour (17:00 – 18:00)	
	Queue (Veh)	RFC	Queue (Veh)	RFC
2023 Future Baseline + Committed Development				
A6 (S)	3	0.70	2	0.61
The Causeway	2	0.60	2	0.52
A6 (N)	3	0.68	4	0.80
2023 Future Baseline + Committed Development + Proposed Development				
A6 (S)	3	0.71	2	0.61
The Causeway	2	0.62	2	0.55
A6 (N)	3	0.69	5	0.80

Source: Table 5.6 of the TA submitted in support of the EQ development (prepared by others)

A421 / A6 Roundabout

4.7.7 The A421 / A6 junction is a grade separated roundabout providing a key intersection between two major A-roads. The junction capacity analysis indicates that the junction is forecast to operate close to its theoretical capacity in the future year scenarios, both during the morning and evening peak periods, with significant queues projected on the A6 (s) arm particularly.

Approach	AM Peak Hour (08:00 - 09:00)		PM Peak Hour (17:00 – 18:00)	
	Queue (Veh)	RFC	Queue (Veh)	RFC
2023 Future Baseline + Committed Development				
A421 (E)	3	0.76	10	0.93
A6 (S)	24	0.99	11	0.93
Holiday Inn	1	0.31	1	0.28
A421 (W)	4	0.77	8	0.90
A6 (N)	5	0.83	14	0.95
2023 Future Baseline + Committed Development + Proposed Development				
A421 (E)	4	078	11	0.93
A6 (S)	28	0.99	12	0.93
Holiday Inn	1	0.31	1	0.29
A421 (W)	4	0.78	9	0.91
A6 (N)	6	0.84	15	0.95

Source: Table 5.7 of TA submitted in support of EQ development (prepared by others)

4.7.8 The potential residential development is forecast to distribute circa 75% of external development traffic north along the A6 towards the A421, Bedford and beyond.

4.7.9 Whilst in real terms this equates to a small number of vehicle movements (less than two each minute -between 1.5-2% increase in traffic demand), it is likely that the residential development traffic will result in a worsening in junction performance.

4.7.10 In view of the forecast constraints at the junction, the Employment Quarter TA presents a potential improvement scheme, which involves the part-signalisation of the roundabout – specifically the A421 off-slips. This is in line with the South East Midlands Local Enterprise Partnership (SEMLEP) Infrastructure Investment Plan. A drawing of the mitigation scheme is attached in **Appendix D**. The results of the improved junction are presented below.

A421 / A6 – Mitigation Scheme

Approach	AM Peak Hour (08:00 - 09:00)		PM Peak Hour (17:00 – 18:00)	
	Deg Sat (%)	MMQ (pcu)	Deg Sat (%)	MMQ (pcu)
2023 Future Baseline + Committed Development				
A6 (N)	77.7	2.5	84.6	4.2
A421(E)	68.0	5.4	77.3	7.2
A6 (S)	92.1	12.4	86.0	7.7
Hotel/PFS access	28.0	0.4	22.7	0.1
A421(W)	79.1	11.3	82.3	13.0
PRC	-2.3		4.7	
2023 Future Baseline + Committed Development + Proposed Development				
A6 (N)	78.3	2.7	84.9	4.2
A421(E)	71.4	5.8	75/1	6.9
A6 (S)	92.6	12.7	86.3	8.0
Hotel/PFS access	28.3	0.5	22.9	0.1
A421(W)	82.9	12.3	83.4	13.3
PRC	-2.9		4.3	

Source: Table 5.8 of TA submitted in support of EQ development (prepared by others)

4.7.11 Modelling of the mitigation scheme indicates that the junction would operate within theoretical capacity in the future year scenarios (DoS 100%), in both the morning and evening peak periods.

4.7.12 However, the A6 (South) arm would continue to operate close to capacity (above design capacity of 90% DoS) and therefore the residual cumulative impact of the potential development on the operation of the junction (particularly the southern A6 arm) will need to be carefully considered as the project moves forward. If further mitigation is required, this will need to be developed.

4.7.13 Given the wider aspirations to deliver an improvement scheme at the A6/A421 junction, the development South of Wixams can assist in delivering an improvement at the junction. The Transport Assessment will consider this in greater detail alongside BBC engagement.

4.7.14 There are various opportunities to further improve the capacity of the junction if required, including full signalisation and approach widening. These will be explored with BBC as the schemes develop and to consider the wider aspirations of the Council.

4.8 Traffic Impact Summary

4.8.1 The initial Wixams traffic distribution estimates were sense checked through the development of a detailed traffic distribution model. Around 75% of development traffic is forecast to route north toward the A421, Bedford and beyond and the remaining 20-25% to route south along the A6. Of development traffic generated, 60% is expected to result in trips external to Wixams.

4.8.2 The development of Land South of Wixams could provide between 300-430 dwellings, which would be expected to generate some 170-240 peak period vehicle movements. Taking account of the traffic assignment analysis, this equates to an increase in traffic flows to the north of Wixams on the A6 by some 3-4% and by around 2% to the south of Wixams. In real terms, this equates to an average less than two additional vehicles each minute on the A6 north of Wixams in the morning and evening peaks, and under one additional vehicle every minute south of Wixams. These increases in traffic are not significant and will not be likely to have a material impact on the operation of the local highway network.

4.8.3 Assessment of the local network carried out in accordance with the Employment Quarter has been considered. This demonstrates that local junctions on the A6 are likely to have sufficient capacity to accommodate development traffic. There are forecast capacity constraints at the A6 / A421 junction, and a mitigation scheme has been developed to improve operation of the network. The development can assist in bringing forward improvements at this location and through the Transport Assessment will consider the need for any further mitigation schemes.

4.8.4 On the basis of this high-level assessment, it is concluded that any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, are capable of being cost effectively mitigated to an acceptable degree.

4.8.5 As the scheme is developed, more detailed assessments will be carried out in dialogue with BBC to confirm the extent of any mitigation that may be required.

SECTION 5 Summary and Conclusions

5.1 This Baseline Transport Appraisal considers the potential for the delivery of 300-430 dwellings on Land South of Wixams. This appraisal presents a high-level assessment of the site against the key transport tests of the NPPF, i.e.:

i Have appropriate opportunities to promote sustainable transport modes been identified and taken up, given the type of development and its location;

ii Can safe and suitable access to the site can be achieved for all users;

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

Sustainable Travel

5.2 The site is well located to local facilities and services being delivered as part of Wixams and would form a natural, well integrated, and cohesive extension to Wixams. The site is well located in transport sustainability terms, close to a good range of local facilities and benefits from direct connections to established walking and cycling networks at Bedford Road and to wider Wixams. Opportunities to access public transport are available close to the site and can be improved.

5.3 It is therefore concluded that the site will be well integrated and will offer good opportunities to promote sustainable transport. A Sustainable Transport Strategy will be delivered to ensure opportunities for sustainable movement are taken up.

Site Access

5.4 Access to the site can be achieved via a roundabout onto the A6. This is consistent with the strategy for the Wider Wixams development and early assessment demonstrates and a roundabout junction can be delivered in line with design requirements, and will operate efficiently, maintaining the free flow of traffic on the wider A6. Agreement will be required from BBC and will need to be designed to ensure the benefit of the re-alignment of the A6 is not lost.

5.5 To deliver non-vehicular connections to the wider community, a secondary access point is shown at the north of the site, to Bedford Road. This could be provided as an access for sustainable modes such as pedestrians, cyclists and potential public transport vehicles. This would also double as an emergency vehicle access.

5.6 Overall, it is concluded that safe and suitable access can be delivered for all users.

Traffic Impact

5.7 The development of Land South of Wixams would be expected to generate some 170-240 peak period vehicle movements. This equates to an increase in traffic flows to the north of Wixams on the A6 by some 3-4% and by around 2% to the south of Wixams.

5.8 Recent assessment of the local network demonstrates that local junctions on the A6 are likely to have sufficient capacity to accommodate development traffic. There are forecast capacity constraints at the A6 / A421 junction, and a mitigation scheme has been developed to improve operation of the network. The development can assist in bringing forward improvements at this location and through the Transport Assessment will consider the need for any further mitigation schemes in this location and on the wider network. Various deliverable opportunities are available to increase capacity in this location if required.

5.9 On the basis of this high-level assessment, it is concluded that any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, are capable of being cost effectively mitigated to an acceptable degree. The resultant impact of the scheme would not be Severe.

Conclusion

5.10 On the basis of the Baseline Transport Appraisal, it is concluded that there are no reasons that the development of Land South of Wixams (Wixams End) cannot be delivered in an acceptable manner in transport terms. The site is in a sustainable location with good potential for sustainable travel modes, access can be achieved to the site in a safe and acceptable manner, and any traffic impacts are likely to be capable of being mitigated to an acceptable level.

FIGURES

A421

B530 AMPTHILL ROAD

WILSTEAD ROAD

A6

GREEN LANE

SOUTHERN CROSS

BEDFORD ROAD

LUTON ROAD

WIXAMS VILLAGE 3

WIXAMS VILLAGE 2

WIXAMS VILLAGE 4

MA3 ALLOCATION

DRAFT POLICY 63 ALLOCATION

B530 BEDFORD ROAD

A6

Elstow

Wixams

Wilstead

Kempston Hardwick

Duck End

Chapel End

Cotton End

Littleworth

Shocott Spring

Wilstead Wood

Workings

KEY

SITE BOUNDARY

DEVELOPABLE AREA

0m 500m 1km

Indicative Scale Bar

FILE REF: ITB15565

REV: B

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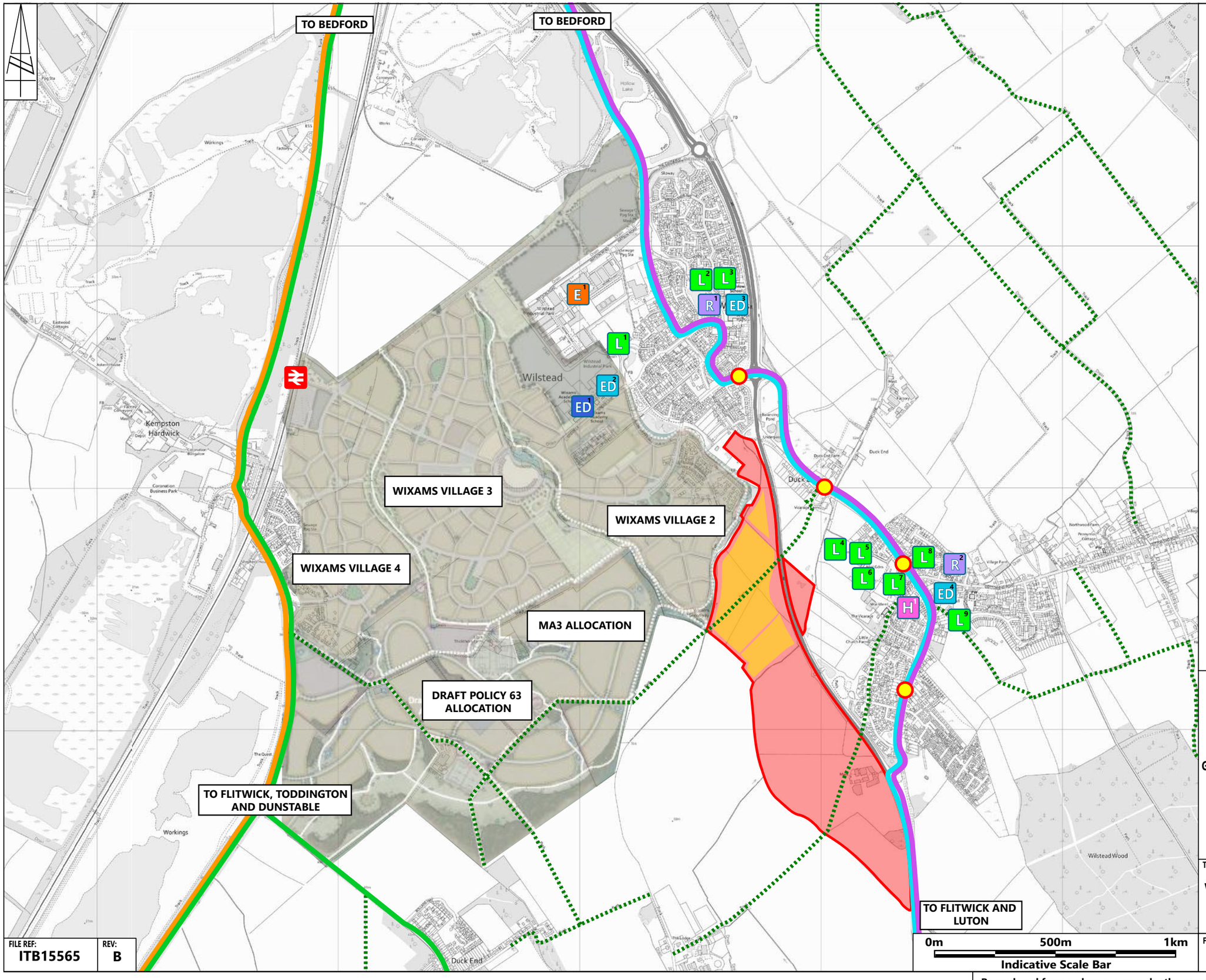
TITLE:

WIXAMS WATES DEVELOPMENTS SITE LOCATION PLAN

FIGURE No:

FIGURE 1



KEY

- SITE BOUNDARY
- DEVELOPABLE AREA
- POTENTIAL RAIL STATION
- FUTURE TOWN CENTRE
- EXISTING BUS STOP
- SERVICE 42
- SERVICE 2
- SERVICE 44
- SERVICE 81
- PROW NETWORK

EXISTING LEISURE FACILITIES

- L1 WIXAM HATTERS F.C.
- L2 PORTU GALLOS RESTAURANT
- L3 LAKEVIEW VILLAGE HALL
- L4 JUBILEE PLAYING FIELDS
- L5 WILSTEAD JUBILEE CENTRE
- L6 WILSTEAD BOWLS CLUB
- L7 THE RED LION PUB
- L8 THE WOOLPACK PUB
- L9 WILSTEAD PARK

EXISTING EMPLOYMENT

- E1 WILSTEAD INDUSTRIAL PARK

EXISTING RETAIL

- R1 BUDGENS
- R2 WILSTEAD POST OFFICE AND STORES

EXISTING EDUCATION

- ED1 WIXAMS ACADEMY
- ED2 WIXAMTREE PRIMARY
- ED3 LAKEVIEW SCHOOL
- ED4 WILSTEAD LOWER SCHOOL

EXISTING HEALTHCARE

- H1 WILSTEAD PHARMACY

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TITLE:

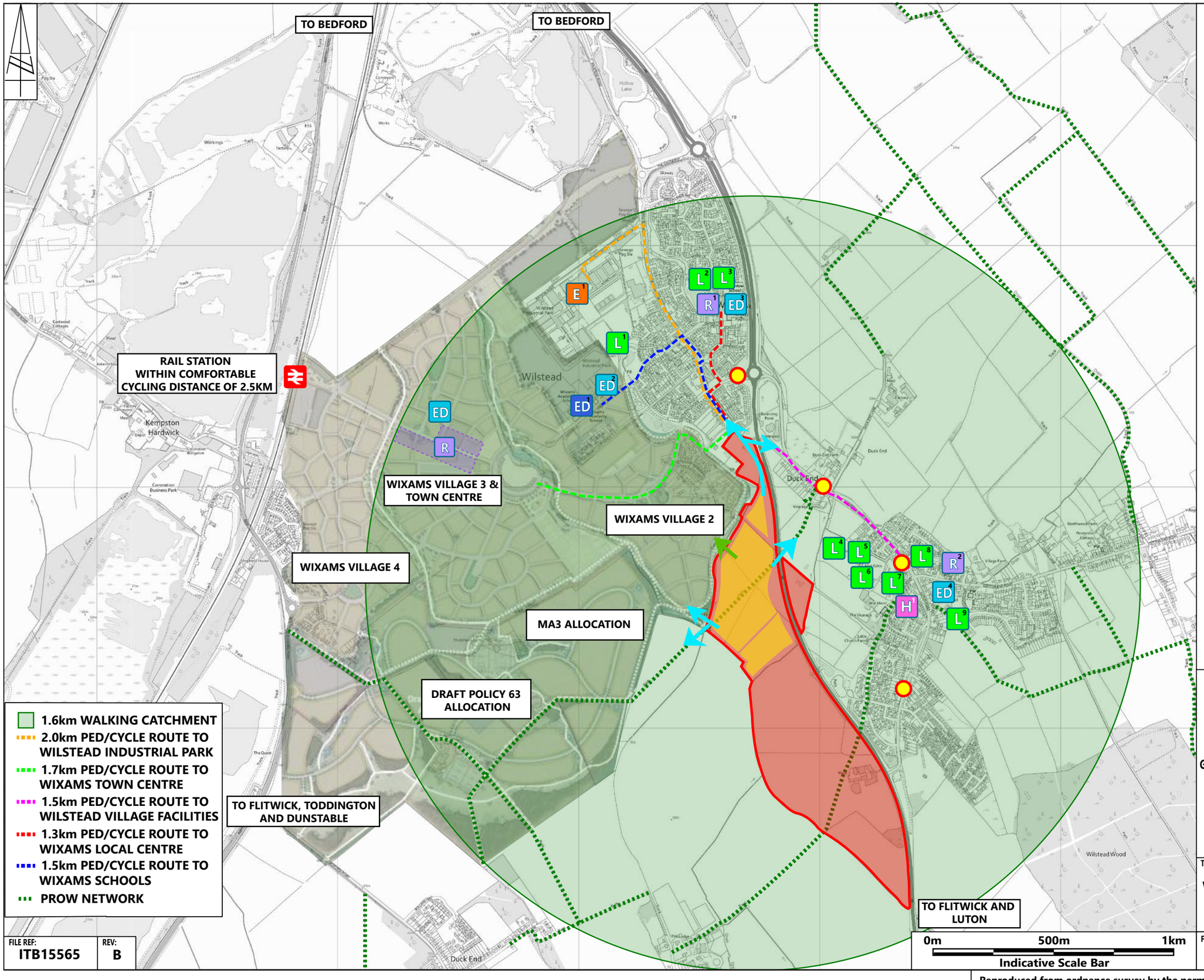
WIXAMS, WATES DEVELOPMENTS ACCESSIBILITY PLAN

FIGURE No:

FIGURE 2

FILE REF: ITB15565

REV: B



KEY

- SITE BOUNDARY
- DEVELOPABLE AREA
- POTENTIAL RAIL STATION
- FUTURE TOWN CENTRE
- EXISTING BUS STOP
- PED/CYCLE ACCESS
- POTENTIAL PED/CYCLE ACCESS

EXISTING LEISURE FACILITIES

- L1 WIXAM HATTERS F.C.
- L2 PORTU GALLOS RESTAURANT
- L3 LAKEVIEW VILLAGE HALL
- L4 JUBILEE PLAYING FIELDS
- L5 WILSTEAD JUBILEE CENTRE
- L6 WILSTEAD BOWLS CLUB
- L7 THE RED LION PUB
- L8 THE WOOLPACK PUB
- L9 WILSTEAD PARK

EXISTING EMPLOYMENT

- E1 WILSTEAD INDUSTRIAL PARK

EXISTING RETAIL

- R1 BUDGENS
- R2 WILSTEAD POST OFFICE AND STORES

EXISTING EDUCATION

- ED1 WIXAMS ACADEMY
- ED2 WIXAMTREE PRIMARY
- ED3 LAKEVIEW SCHOOL
- ED4 WILSTEAD LOWER SCHOOL

EXISTING HEALTHCARE

- H1 WILSTEAD PHARMACY

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TITLE:

WIXAMS, WATES DEVELOPMENTS PEDESTRIAN/CYCLE CONNECTIVITY PLAN

FILE REF: ITB15565 | REV: B

FIGURE No: **FIGURE 2**

DRAWINGS

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KEY:
- SITE BOUNDARY
- EXTENTS HIGHWAY BOUNDARY
- PUBLIC RIGHT OF WAY

REV	DATE	BY	DESCRIPTION	CHK	APD

STATUS: FOR INFORMATION

TITLE: PROPOSED SITE ACCESS ARRANGEMENTS

PROJECT: LAND EAST OF WIXAMS, WIXAMS

CLIENT: WATES DEVELOPMENTS

DRAWN:	CHECKED:	APPROVED:
MC	MC	TW
PROJECT No: ITB15565	SCALE @ A1: AS SHOWN	DATE: 05.03.20

DRAWING No: ITB15565-GA-001 | REV: -

APPENDIX A. Highway Boundary Data

🟥 BD146362

🟦 BD95464

🟩 BD289419

🟨 Highways

Wilstead	Scale 1:2500 @ A0
Land Registry & Highways overlay on OS mapping	January 2019

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APPENDIX B. TRICS Data

Calculation Reference: AUDIT-236601-200309-0339

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED
VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	KC	KENT	2 days
04	EAST ANGLIA		
	NF	NORFOLK	2 days
05	EAST MIDLANDS		
	DS	DERBYSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NE	NORTH EAST LINCOLNSHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
Actual Range: 275 to 432 (units:)
Range Selected by User: 250 to 550 (units:)

Parking Spaces Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/11 to 23/09/19

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	2 days
Tuesday	1 days
Wednesday	2 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	5 days
Directional ATC Count	1 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	1
Edge of Town	5

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	4
Out of Town	1
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C3	6 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	2 days
10,001 to 15,000	2 days
20,001 to 25,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

25,001 to 50,000	1 days
50,001 to 75,000	3 days
75,001 to 100,000	1 days
125,001 to 250,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	3 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	2 days
No	4 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	6 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 DS-03-A-02 MIXED HOUSES DERBYSHIRE
RADBOURNE LANE
DERBY

Edge of Town
Residential Zone
Total Number of dwellings: 371
Survey date: TUESDAY *10/07/18* *Survey Type: MANUAL*

2 KC-03-A-06 MIXED HOUSES & FLATS KENT
MARGATE ROAD
HERNE BAY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 363
Survey date: WEDNESDAY *27/09/17* *Survey Type: MANUAL*

3 KC-03-A-07 MIXED HOUSES KENT
RECULVER ROAD
HERNE BAY

Edge of Town
Residential Zone
Total Number of dwellings: 288
Survey date: WEDNESDAY *27/09/17* *Survey Type: MANUAL*

4 NE-03-A-02 SEMI DETACHED & DETACHED NORTH EAST LINCOLNSHIRE
HANOVER WALK
SCUNTHORPE

Edge of Town
No Sub Category
Total Number of dwellings: 432
Survey date: MONDAY *12/05/14* *Survey Type: MANUAL*

5 NF-03-A-06 MIXED HOUSES NORFOLK
BEAUFORT WAY
GREAT YARMOUTH
BRADWELL
Edge of Town
Residential Zone
Total Number of dwellings: 275
Survey date: MONDAY *23/09/19* *Survey Type: MANUAL*

6 NF-03-A-07 MIXED HOUSES & FLATS NORFOLK
SILFIELD ROAD
WYMONDHAM

Edge of Town
Out of Town
Total Number of dwellings: 297
Survey date: FRIDAY *20/09/19* *Survey Type: DIRECTIONAL ATC COUNT*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	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	6	338	0.086	6	338	0.347	6	338	0.433
08:00 - 09:00	6	338	0.135	6	338	0.415	6	338	0.550
09:00 - 10:00	6	338	0.140	6	338	0.157	6	338	0.297
10:00 - 11:00	6	338	0.115	6	338	0.145	6	338	0.260
11:00 - 12:00	6	338	0.117	6	338	0.129	6	338	0.246
12:00 - 13:00	6	338	0.159	6	338	0.149	6	338	0.308
13:00 - 14:00	6	338	0.154	6	338	0.145	6	338	0.299
14:00 - 15:00	6	338	0.164	6	338	0.187	6	338	0.351
15:00 - 16:00	6	338	0.299	6	338	0.188	6	338	0.487
16:00 - 17:00	6	338	0.321	6	338	0.180	6	338	0.501
17:00 - 18:00	6	338	0.383	6	338	0.170	6	338	0.553
18:00 - 19:00	6	338	0.329	6	338	0.211	6	338	0.540
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.402			2.423			4.825

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	275 - 432 (units:)
Survey date date range:	01/01/11 - 23/09/19
Number of weekdays (Monday-Friday):	10
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

APPENDIX C. Distribution Model

i-Transport Project No ITB15565
i-Transport Project Title - Wixams

Journey to Work Distribution Model

Broad Destination	Total		Proportion per route	By Route	Route 1	Route 2	Route 3	Route 4	Route 5
	Proportion by Car	Driving a car or van		Proportion by car					
Luton	9.0%	228	50%	4.5%	A6 - South	A6 South	-		
			50%	4.5%	A6 - North	A421 - West			
Milton Keynes	6.5%	163	100%	6.5%	A6 - North	A421 - West	-		
Sandy	2.6%	65	100%	2.6%	A6 - North	A421 - East	-		
Briggleswade	0.9%	23	50%	0.5%	A6 - South	-	-		
			50%	0.5%	A6 - South	A507 E	-		
Cranfield	2.4%	60	50%	1.2%	A6 - North	A421 - West	-		
			50%	1.2%	A6 - South	-	-		
Ampthill	3.7%	94	100%	3.7%	A6 - South	-	-		
Marston Moretaine	0.6%	15	70%	0.4%	A6 - North	A421 - West	-		
			30%	0.2%	A6 - South	-			
Shefford	3.4%	85	50%	1.7%	A6 - South	Luton Road	-		
			50%	1.7%	A6 - South	A507 E			
Flitwick	1.5%	38	50%	0.8%	A6 - South	-	-		
			50%	0.8%	A6 - South	A507 W			
Harlington	1.2%	30	50%	0.6%	A6 - North	A421 - West	-		
			50%	0.6%	A6 - South	A6 South			
Bedford	59.1%	1490	100%	59.1%	A6 - North	A6 - North	-		
Huntingdon	0.9%	23	100%	0.9%	A6 - North	A421 - East	-		
Hemel Hempstead	0.4%	11	50%	0.2%	A6 - South	A6 South	-		
			50%	0.2%	A6 - North	A421 - West			
Hitchin	1.1%	27	100%	1.1%	A6 - South	A6 South	-		
Stevenage	0.9%	23	50%	0.5%	A6 - South	A507 E	-		
			50%	0.5%	A6 - South	-			
Northampton	0.5%	13	100%	0.5%	A6 - North	A421 - West	-		
Shortstown	5.3%	133	50%	2.6%	A6 - North	A421 - East	-		
			50%	2.6%	A6 - South	Luton Road			
Total	100.0%	2521		100.00%					

Route 1	Proportions of Cars	0.43
A6 - South	21%	9%
A6 - North	79%	34%
		0%
	100%	43%

Route 2	Proportions of Cars	0.43
A421 - West	14%	6.0%
A421 - East	6%	2.6%
Bedford Road - East	0%	0.0%
-	7%	2.9%
A6 - North	59%	25.5%
A6 South	6%	2.8%
Luton Road	4%	1.9%
A507 E	3%	1.1%
A507 W	1%	0.3%
	100%	43%

Route 3	Proportions of Cars	0.43
-	89%	38%
	89%	38.4%

i-Transport Project Title - Wixams

30 minute JT

Gravity Model

Location	Route 1	%	Route 2	%	Time (mins)	2011 Census Total Population	P/T	P/T^2	% of total	Car driver mode split		% of Car Driver	% of Car by Route
Bedford	A6 - North	25.1%	A6 - North	25.1%	17	101,066	5,945	350	26.9%	77%	20.8%	25.1%	100.0%
Biggleswade	A6 - South	0.9%	-	0.9%	28	16,551	591	21	1.6%	92%	1.5%	1.8%	50.0%
	A6 - South	0.9%	A507 E	0.9%									50.0%
Flitwick	A6 - South	2.5%	-	2.5%	20	12,998	650	32	2.5%	83%	2.1%	2.5%	100.0%
Luton	A6 - South	12.5%	A6 South	12.5%	27	209,127	7,745	287	22.1%	93%	20.7%	25.0%	50.0%
	A6 - North	12.5%	A421 - West	12.5%									50.0%
Milton Keynes	A6 - North	28.2%	A421 - West	28.2%	27	248,821	9,216	341	26.3%	89%	23.3%	28.2%	100.0%
Shortstown	A6 - North	1.0%	A421 - East	1.0%	8	2,401	300	38	2.9%	59%	1.7%	2.0%	50.0%
	A6 - South	1.0%	Luton Road	1.0%									50.0%
Shefford	A6 - South	1.5%	Luton Road	1.5%	13	5,881	452	35	2.7%	90%	2.4%	2.9%	50.0%
	A6 - South	1.5%	A507 E	1.5%									50.0%
Wilstead	A6 - North	3.7%	Bedford Road - East	3.7%	4	2,177	544	136	10.5%	59%	6.1%	7.4%	50.0%
	A6 - South	3.7%	Luton Road	3.7%									50.0%
Ampthill	A6 - South	4.9%	-	4.9%	11	7,028	639	58	4.5%	91%	4.1%	4.9%	100.0%
		100.0%		100.0%		606,050	26,083	1,298	100.0%			100.0%	

56.8%

Route 1	Total		Scaled
A6 - North	71%		40%
A6 - South	29%		17%
	100%		**57%**

Route 2	Total		Scaled
A6 - North	25%		14%
A6 South	12%		7%
A421 - West	41%		23%
A421 - East	1%		1%
Bedford Road - East	4%		2%
A507 E	2%		1%
Luton Road	6%		4%
-	8%		5%
	100%		**57%**

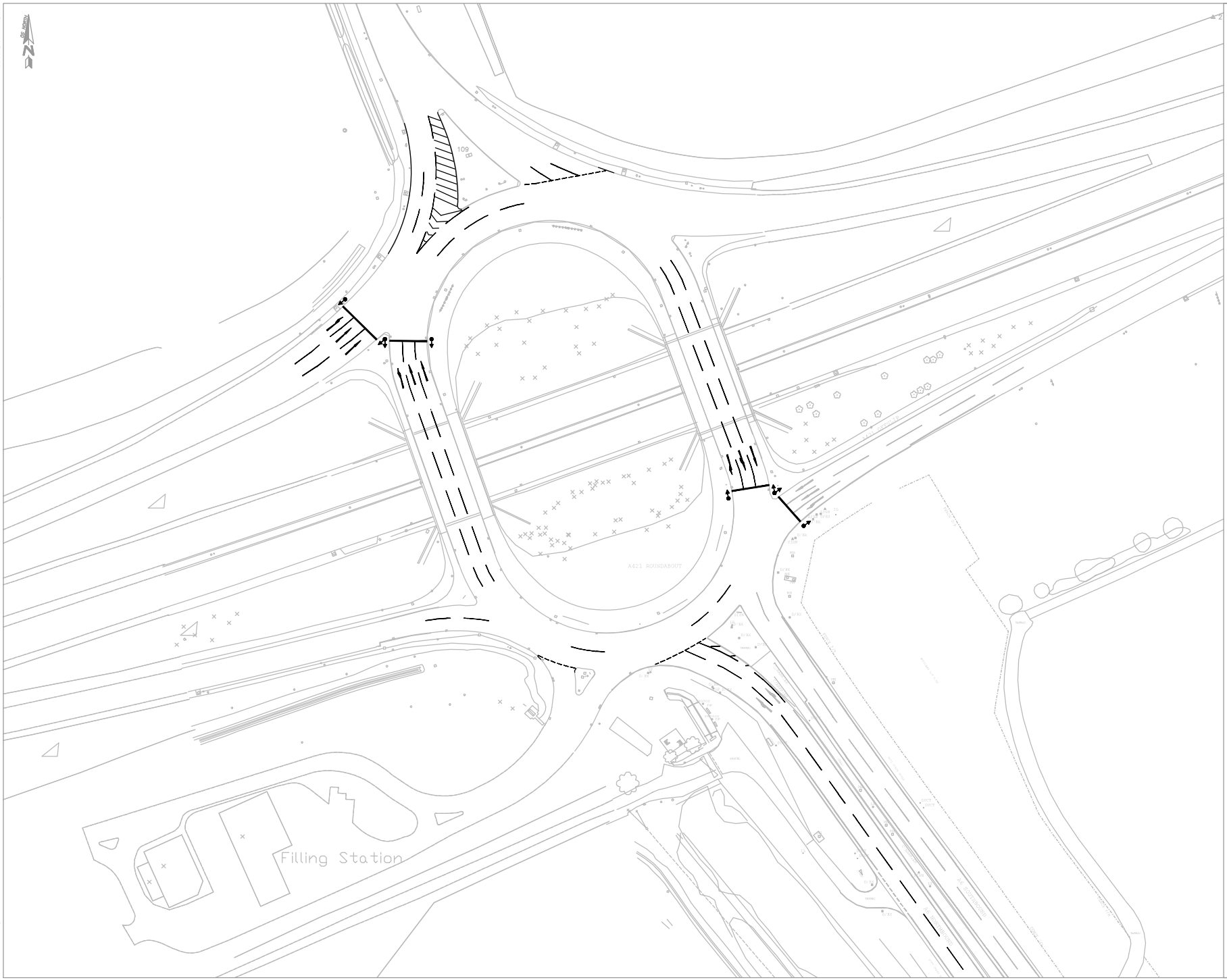
i-Transport Project No ITB15565
i-Transport Project Title - Wixams

Combined Travel to Work and Gravity Model Distribution - Routing

Route 1	JtW	Gravity	100.00%
A6 - North	34%	40%	74.3%
A6 - South	9%	17%	25.7%
Total	43%	57%	

Route 2	JtW	Gravity	100%
A6 - North	26%	14%	39.8%
A6 South	3%	7%	9.9%
A421 - West	6%	23%	29.1%
A421 - East	3%	1%	3.2%
Bedford Road - East	0%	2%	2.1%
-	3%	5%	7.7%
Luton Road	2%	4%	5.4%
A507 W	0%		0.3%
A507 E	1%	1%	2.5%
Total	43%	57%	

APPENDIX D. A6 / A421 Mitigation Scheme



mode
transport planning
mode transport planning
t 0161 974 3208
e info@modetranport.co.uk
w www.modetransport.co.uk

notes:

1. this drawing is to be read in conjunction with all other relevant drawings, any discrepancies, errors or omissions to be brought to the attention of overseeing organisation.
2. all dimensions to be checked before commencement of work on site.
3. all dimensions in metres unless otherwise stated.
4. the design is subject to approval of bedfordshire county council.
5. drawing based on drawing 27760 - RG-M-19C - Illustrative Masterplan provided by Barton Willmore.

issue/revision

i/r	date	description
-	04/05/2018	issued

client: GALLAGHER ESTATES

project: Future Wixams Development

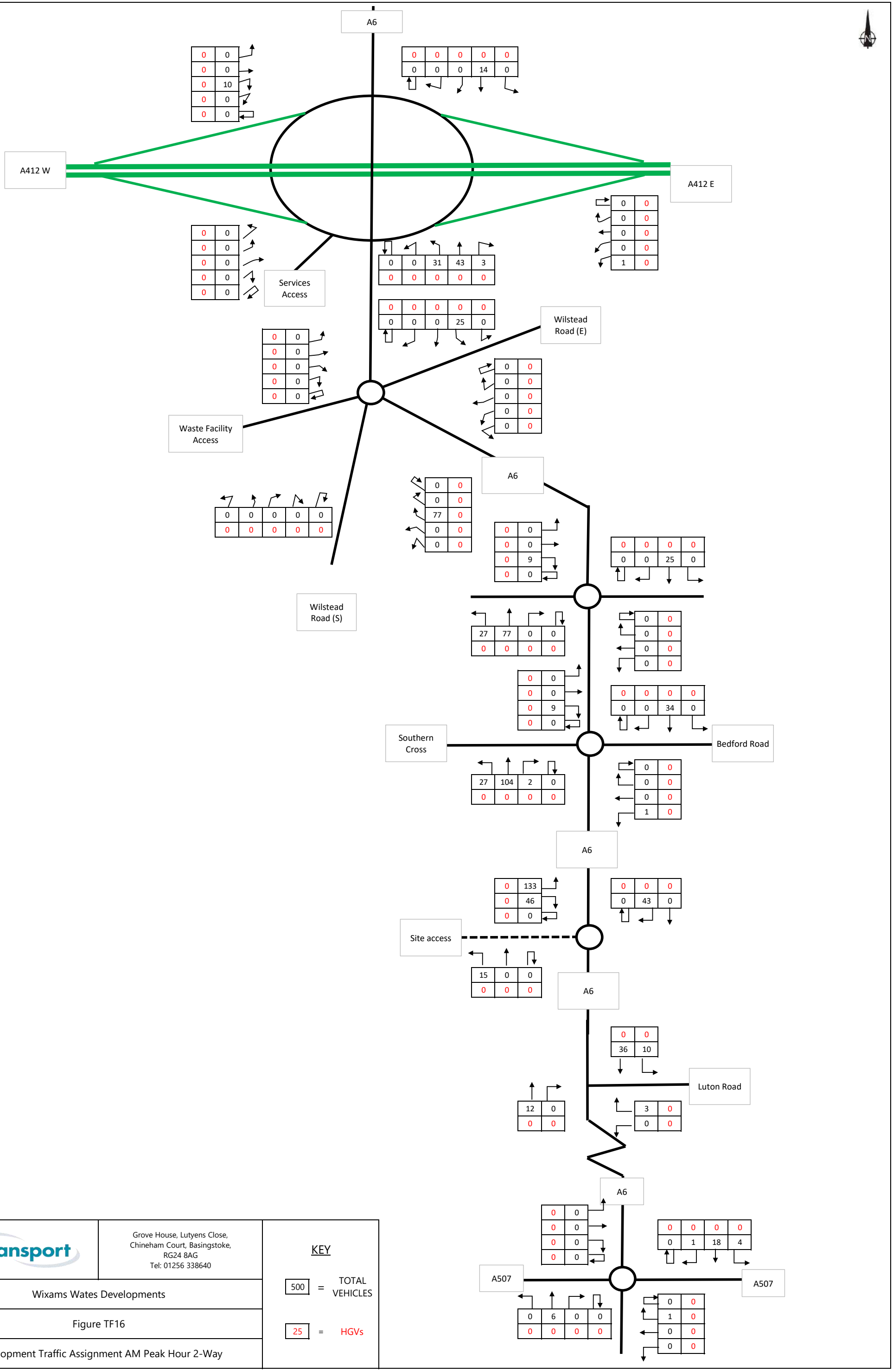
project number: J323397

scale: 1:1000@A3

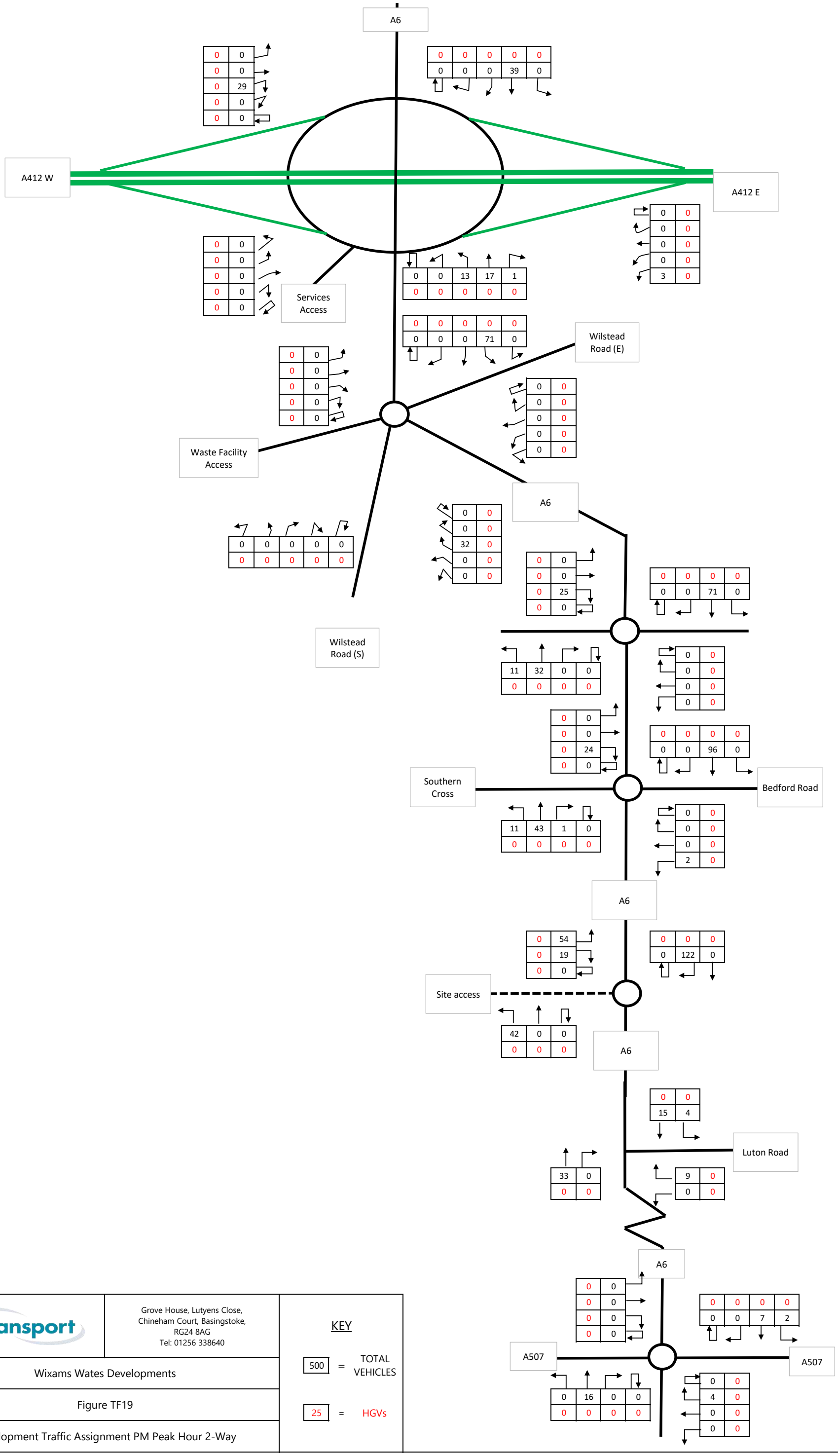
drawing title:
Partial Signalisation Junction Improvements

drawing number:
J32-3397-PS-003

APPENDIX E. Development Assignment – 430 Units

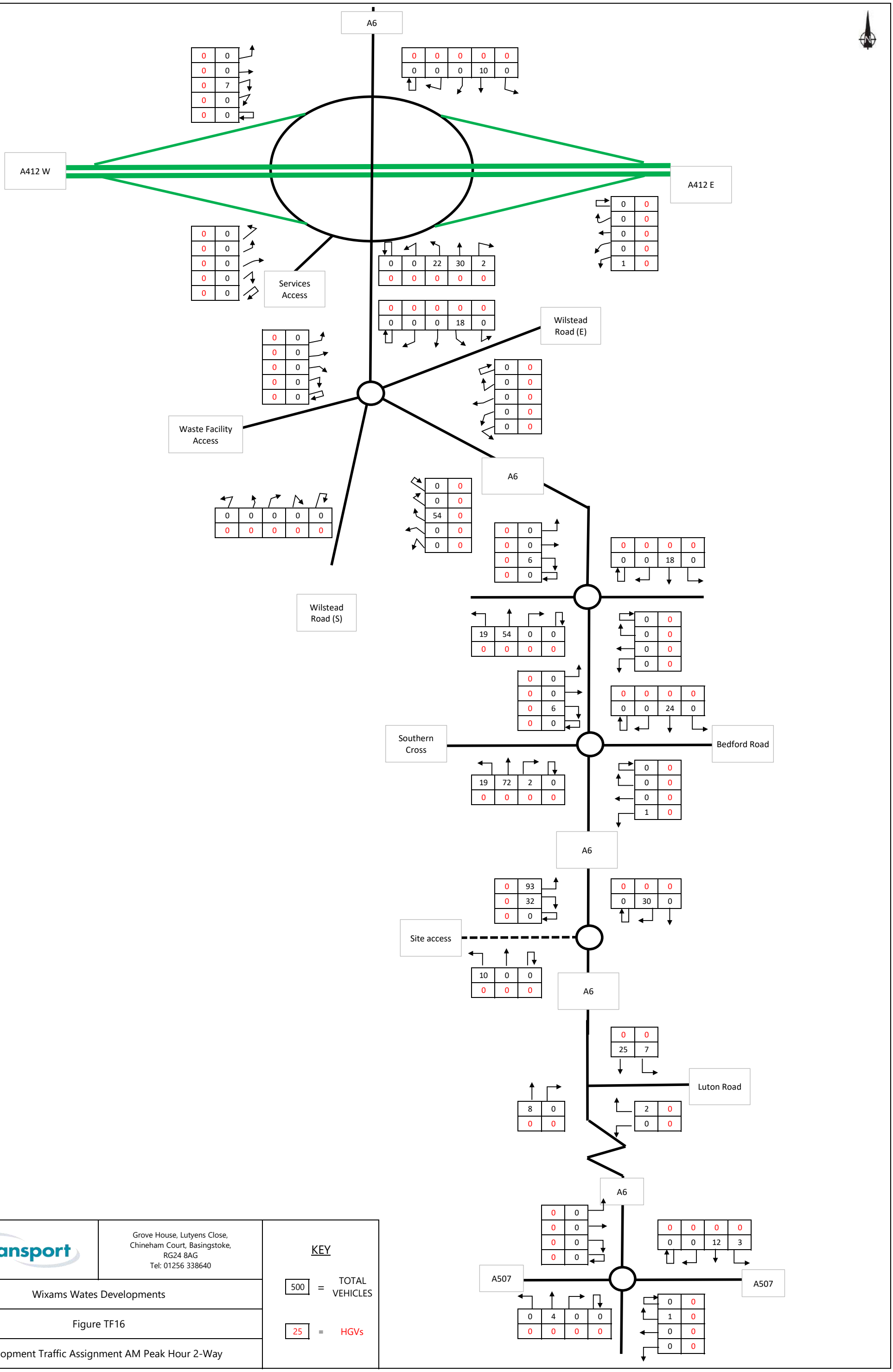


i-Transport	Grove House, Lutyens Close, Chineham Court, Basingstoke, RG24 8AG Tel: 01256 338640	KEY
Wixams Wates Developments		500 = TOTAL VEHICLES
Figure TF16		25 = HGVs
Development Traffic Assignment AM Peak Hour 2-Way		

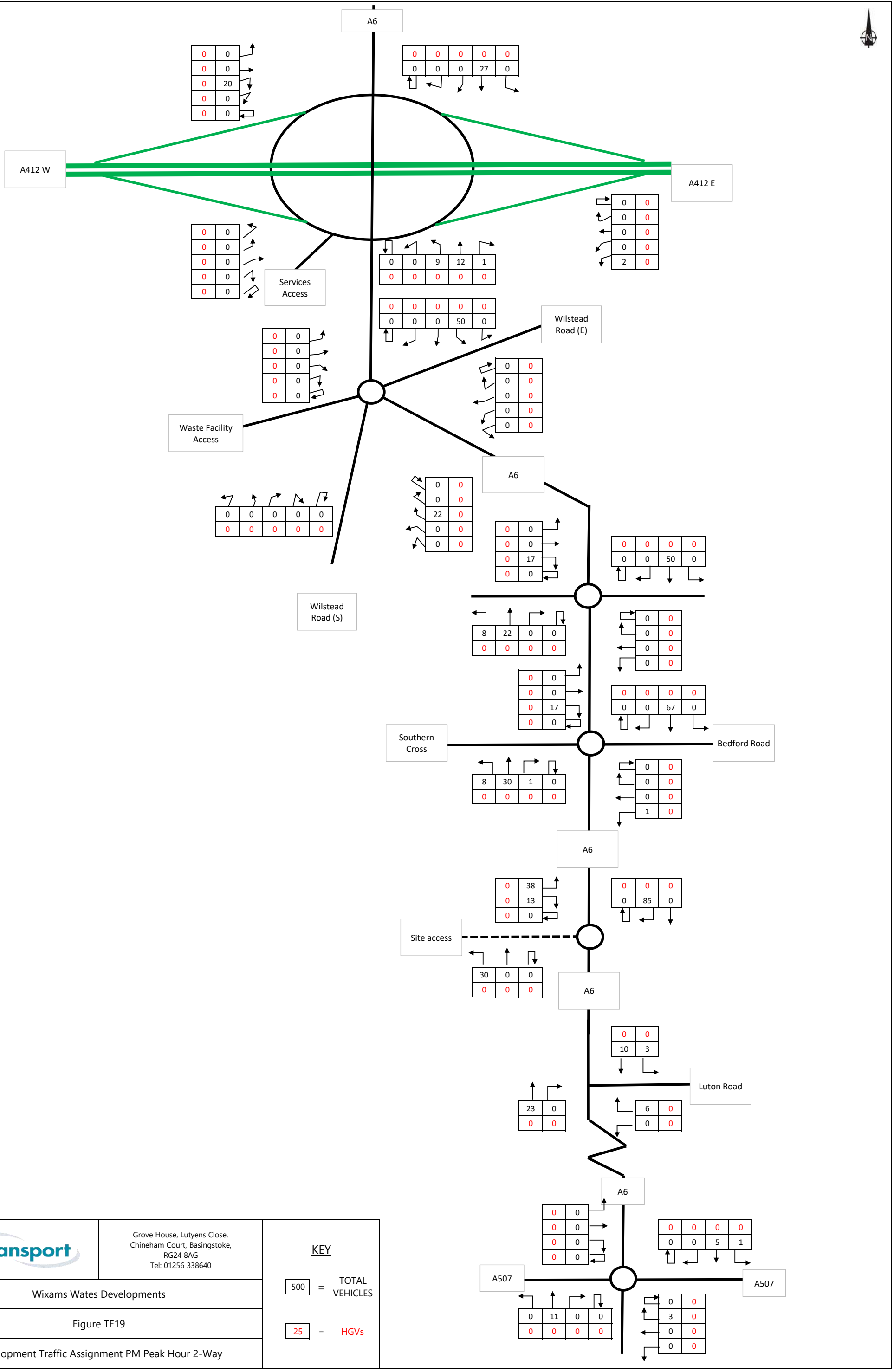


i-Transport	Grove House, Lutyens Close, Chineham Court, Basingstoke, RG24 8AG Tel: 01256 338640	KEY
Wixams Wates Developments		500 = TOTAL VEHICLES
Figure TF19		25 = HGVs
Development Traffic Assignment PM Peak Hour 2-Way		

APPENDIX F. Development Assignment – 300 Units



i-Transport	Grove House, Lutyens Close, Chineham Court, Basingstoke, RG24 8AG Tel: 01256 338640	KEY
Wixams Wates Developments		500 = TOTAL VEHICLES
Figure TF16		25 = HGVs
Development Traffic Assignment AM Peak Hour 2-Way		



i-Transport	Grove House, Lutyens Close, Chineham Court, Basingstoke, RG24 8AG Tel: 01256 338640	KEY
Wixams Wates Developments		500 = TOTAL VEHICLES
Figure TF19		25 = HGVs
Development Traffic Assignment PM Peak Hour 2-Way		

APPENDIX G. Emerging Masterplan

HO8(4) - Central Bedfordshire Local Plan

MA3 - Central Bedfordshire Local Plan

HOU15 - Bedford Plan 2040 (DRAFT)

HAS27 - Central Bedfordshire Local Plan

Additional O&H Land - CBC confirmed logical extension to MA3

5S - Bedford Borough Council Settlement Policy Area

RE-FORMAT

www.re-format.co.uk
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drawn by: RP
checked by: MS
date created: Jan 2020
scale at A3: 1:10000

project title: Land west of A6, Wixams
document title: Wider Masterplan

project	originator	volume	level	type	role	number
F19146-	RFT -	01 -	XX -	DR -	A -	0104

status: S2
suitability description: Suitable for Information
revision: 01

rev.	date	changes description	status	issued by
01	13/07/2022	—	S2	

N

i-Transport – Basingstoke | Manchester | London | Leeds
www.i-transport.co.uk