



**Alder Park, Harwich Road,
Little Bentley, Colchester**

Transport Assessment

on behalf of

Brand Art Ltd

July 2021

INTERMODAL TRANSPORTATION

IT2199

Hunters Court, Debdon Road, Saffron Walden, Essex CB11 4AA Tel: 01799 529529 Fax: 01799 529530 e-mail: enquiries@inter-modal.co.uk



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1 INTRODUCTION

- 1.1 Intermodal Transportation Ltd (ITL), an independent consultancy specialising in highway engineering and transportation planning, have been appointed by Brand Art to produce a Transport Assessment (TA) report to support a planning application for the provision of a commercial development at Alder Park, located to the east of Harwich Road in Little Bentley, Colchester.
- 1.2 Permission was granted for the provision of 2 buildings with a total floor area of 1500 sqm of office use on appeal (appeal ref: APP/P1560/W/19/3226387) after the original application dated 13th November 2017 (Ref 17/02014/FUL) was refused. The proposal now includes a commercial scheme of 3451 sqm, which includes six office buildings and associated car parking spaces.
- 1.3 In producing this report, representatives of ITL have discussed the scope of the study with a development control officer at Essex County Council (ECC) as the Local Highway Authority (LHA); and engaged in discussions with Highways England (HE), the highway authority for the nearby A120 trunk road. In addition, a representative of ITL visited the site.
- 1.4 Scoping correspondence with ECC and HE is contained at Appendix A. In preparing this TA, ITL has taken into consideration the highway consultation responses from both authorities. In accordance with the scoping discussions, the following issues have been investigated as part of this study: -
- Description of the site in its local context;
 - Description of the development proposal;
 - Consideration of the accessibility of the site by non-car modes of travel, i.e. walking, cycling and public transport;
 - Calculation of the level of traffic that would be attracted by the development proposal during the typical weekday AM and PM peak hours using the TRICS database;
 - Distribution of the development traffic on the local road network;
 - Assessment of the performance of the following junctions for the assumed opening year and the design year;



Junction 1: A120 / Harwich Road Roundabout Junction

Junction 2: Site Access / Harwich Road Priority Junction

- Confirmation / justification of the vehicular access arrangements including undertaking Auto-Track swept path assessments; and
- Consideration of the proposed parking provision at the development in accordance with the relevant local parking standards.



2 SITE LOCATION AND LOCAL ROAD NETWORK

Site Location

- 2.1 The site is located 8km to the east of Colchester and approximately 1.4km to the south-west of Little Bentley. The site is currently an open field and is situated to the east of Harwich Road. The southern and eastern boundaries of the site interface with agricultural land. The western boundary is formed by Harwich Road and to the north the site is bounded by a farm house/cottages. The site location in the local and wider context is shown on drawing IT2199/TA/01.

Local Road Network

- 2.2 Harwich Road is subject to the national speed limit for a single lane carriageway within the vicinity of the site, i.e. 60mph. Within the vicinity of the site, Harwich Road runs in a roughly south-west to north-east alignment. The carriageway contains an inward bend along the frontage of the site which improves visibility from the site access. Harwich Road is approximately 7.3m wide adjacent to the site without footways on either side.
- 2.3 Plates 1 and 2 show views looking north and south respectively along Harwich Road, in the vicinity of the site access.

**Plate 1: A View of Harwich Road
Looking North**



**Plate 2: A View of Harwich Road
Looking South**



- 2.4 Harwich Road connects with the A120 forming a roundabout junction approximately 250m to the north of the site. The A120 / Harwich Road roundabout has been recently constructed, replacing the priority junction. The roundabout consists of 5 arms, with the fifth arm connecting to a farm track only.



- 2.5 To the south / west of the site, Harwich Road continues towards Elmstead Market and changes in name to Bromley Road, which in turn joins with Clacton Road forming a signal controlled junction. Clacton Road forms part of the A133 and serves as an access to Colchester.
- 2.6 The site is well connected to the wider trunk road network, which provides a good level of accessibility to Colchester.



3 PROPOSED DEVELOPMENT

- 3.1 The site is currently an open field, and covers an area of approximately 5.2 hectares. The proposed development would be served from a new access junction, located off Harwich Road.
- 3.2 The development proposal involves the provision of six units. The units would vary between 338 sqm and 733 sqm. Unit 1 would be three storey whilst Unit 6 would consist of a ground floor only. The remaining four units would be double storey. The proposed Layout plan is contained in Appendix B of this report.
- 3.3 Vehicular access to the proposed development would be achieved via a new access forming a priority junction with Harwich Road. The initial stretch of the access would be 6.75m wide with 2m wide footways on either side. Bus shelters would be provided on both sides of Harwich Road within the vicinity of the site access. The proposed footways would provide access to the bus stops. The proposed access junction would be located in approximately the same position as the access junction for the extant office proposal at the site.
- 3.4 The achievable visibility splays would be 2.4m x 215m to the nearside carriageway edge in both directions. This level of visibility is appropriate in consideration of the speed limit on Harwich Road, within the vicinity of the site access.
- 3.5 A plan showing the visibility splays along Harwich Road at the proposed site access junction is shown in Drawing IT2199/TA/02. It is proposed that the majority of the internal estate roads would remain in private ownership, although as shown on drawing IT2199/TA/02, the initial stretch of the access road including a type 3 turning head would be offered up for adoption.
- 3.6 Auto track swept path analysis were undertaken at the proposed site access junction selecting a large 4 axle refuse vehicle and a 10m rigid HGV as the largest design vehicles expected to visit the site regularly. The swept path sketches show the vehicles accessing and egressing the site access and are contained in Appendix C.



- 3.7 The proposed development would provide 116 car parking spaces which includes 12 disabled parking spaces. The provision of parking spaces in accordance with Essex County Council (ECC) Parking Standards are considered in Section 6.
- 3.8 As part of their pre-application response, Tendring District Council indicated that the planning application should be accompanied by a Construction Method Statement detailing the size, number and frequency of construction vehicles visiting the site.
- 3.9 It is considered that until a contractor is engaged that any information provided in terms of construction activity would be approximate only and therefore of limited benefit. As such it is considered that the appropriate approach would be to require the provision of a Construction Method Statement as a pre-commencement condition.
- 3.10 Notwithstanding the above, at this stage the developer has confirmed that all construction vehicles would be routed to / from the A120. In addition, the developer has confirmed that they would propose that the proposed vehicular access for the final scheme be constructed to base course prior to the commencement of development on site and be utilised as the access / egress for the site during the construction phase.



4 ACCESSIBILITY BY ALTERNATIVE MODES

Walking

- 4.1 The 2019 National Travel Survey (NTS) indicates that 80% of trips of less than 1 mile (or 1.6km) are undertaken on foot. It is therefore considered that distance should be regarded as applicable in terms of defining the walk in catchment of a new development such as the development proposal.
- 4.2 Given the rural location of the site, there are no facilities within the vicinity of the site. Hence walking trips to the site would be modest.
- 4.3 It is considered that in the context of a rural site such as the study site, car sharing represents the most likely sustainable mode to be used by staff for travel to / from the site. As such, it is considered that where possible staff at the site should be encouraged to car share as that would reduce single occupancy vehicle trips.

Cycling

- 4.4 The former national planning guidance PPG13 paragraph 77 states that *"Cycling also has potential to substitute for short car trips, particularly those less than 5 kilometres, and to form part of a longer journey by public transport"*.
- 4.5 Taking into account the 5km cycle distance, which equates to approximately 20 minutes cycling time, the catchment area of the site by cycle would include Elmstead Market, Great Bentley, Little Bentley, Tendring and some of the surrounding villages.
- 4.6 The site is located close to National Cycle Route (NCR) 51. NCR 51 passes along Harwich Road which is located immediately to the west of the site. The route runs through Milton Keynes, Bedford, Bury St Edmunds, Ipswich and also links Oxford and Cambridge along with Felixstowe, Harwich and Colchester. Within the vicinity of the site, NCR 51 passes through Rectory Lane and follows the route along Harwich Road and continues towards Elmstead Market.



Bus

- 4.7 Guidance generally recognises that walking distances to access bus services should lie between a desirable distance of 400m and acceptable distance of 800m. Furthermore, it is generally recognised that the maximum convenient walking distance in order to access urban bus services is around 500m. This walking distance to a bus stop has emerged from theoretical studies and has been supported by research undertaken for the National Travel Survey (NTS).
- 4.8 The closest bus stop to the site is the Mary Lane bus stop located 940m to the south of site on Harwich Road. Table 4.1 summarises the bus services available from this bus stop.

Table 4.1: Bus Service Summary

Bus Service	Route	Weekday	
		Operation	Frequency
77A	Colchester–Hare Green–Frating–Great Bentley–Aingers Green–St Osyth	08:40–10:40 14:06–15:28	2 Buses
105	Colchester–Great Bromley–Little Bentley–Tendring Heath–Weeley–Walton on Naze	08:21–19:47	1 Hour
107	Colchester–Great Bromley–Little Bentley–Tendring Heath–Weeley–Walton on Naze	13:21–17:27	2 Buses

- 4.9 As explained in Paragraph 3.3, bus stops would be provided adjacent to the site access in order to improve accessibility to the site. Bus services 105 and 107 currently pass the site on Harwich Road and would call at the proposed bus stops, adjacent to the site.

Train

- 4.10 The proposed development is located around 11 km from Colchester Town Railway Station. This is beyond the generally regarded reasonable upper limit walking threshold of 1km to access train services and also above the aforementioned 5km cycling threshold. However, it could be accessed from the site by bus service 105 and 107 which serve Stop B at Colchester Town railway station. The total journey time from the site would be approximately 30 minutes.



- 4.11 Trains at Colchester Town railway station are operated by Greater Anglia. Table 4.2 provides a summary of train services operating at the railway station.

Table 4.2: Summary of Train Services at Colchester Town Railway Station

Destination	Monday–Friday			
	Operating Times	Average Journey Time	Trains per Hour	Changes
London Liverpool Street	06:19–00:00	1 Hour 20 Min	2 to 4	1
Colchester	06:26–23:07	8 Min	2 or 4	0



5 TRAFFIC ATTRACTION AND DISTRIBUTION

Introduction

- 5.1 Within this chapter the level of traffic attracted by the development proposal is assessed with reference to the Trip Rate Information Computer System (TRICS) database.

Traffic Attraction

- 5.2 The TRICS database was interrogated in order to establish appropriate trip rates for calculating the likely level of traffic attracted by the proposed development. The TRICS good practice guidance of selecting sites of similar geographical characteristics was adopted where practical.
- 5.3 The 'Business Park' category within the 'Employment' land use type of the TRICS database was interrogated. The selected geographical regions did not include London, Republic of Ireland and Northern Ireland. Furthermore, to ensure compatibility between the proposed development and the surveys selected from the TRICS database, a gross floor area range of 975 sqm to 12500 sqm was selected. The date range for the search was 01/01/1990 to 21/11/2019. The range was set back to earlier years in order to obtain a larger sample size as there were limited number of sites available in recent years. The selected locations included 'Free Standing' and 'Neighbourhood Centre'. The search criteria resulted in the identification of 3 surveys.
- 5.4 The AM and PM peak hour trip rates (per 100 sqm) derived from the TRICS search are shown in Table 5.1 below. The TRICS outputs from the above search are contained in Appendix D.

Table 5.1: TRICS Weekday Trip Rates Per 100sqm

Use	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (17:00 – 18:00)		Daily Average (07:00 – 19:00)	
	Arrivals	Departure	Arrivals	Departure	Arrivals	Departure
Business Park	2.160	0.240	0.302	1.841	8.042	7.640

- 5.5 Application of the above TRICS trip rates as relevant to the development results in the calculation of the traffic levels shown in the following Table 5.2.



Table 5.2: Likely Level of Traffic Attracted by the Development

Use	Area (sqm)	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (17:00 – 18:00)		Daily (07:00 – 19:00)	
		Arrivals	Departure	Arrivals	Departure	Arrivals	Departure
Business Park	3451	75	8	11	64	278	264
Total Two Way		83		75		542	

- 5.6 On the basis of the flows shown in Table 5.2 above, it is considered that the development proposal would generate moderate traffic levels of approximately 1.5 movements per minute during the typical road network peak hours. The expected development traffic levels shown in Table 5.2 should be viewed in the context that the site benefits from extant permission for an office scheme with a floor area that was approximately 44% of that of the current proposal. Therefore in very approximate terms the extant proposal would be likely to attract half of the traffic levels shown in Table 5.2.

Traffic Distribution

- 5.7 The peak hour development traffic flows shown in Table 5.2 were distributed in accordance with observed proportions as explained in Section 6.



6 JUNCTION CAPACITY ASSESSMENT

Flow Derivation

- 6.1 The performance of the local road network is considered within this section of the TA. As previously stated, the capacity of the following junctions is assessed;
- Junction 1: A120 / Harwich Road Roundabout Junction
 - Junction 2: Site Access / Harwich Road Priority Junction
- 6.2 As this report was prepared during the Covid19 pandemic and it was not possible to undertake background traffic flows during that time due to the associated travel restrictions, ITL contacted Highways England to obtain base traffic flows for the A120 / Harwich Road roundabout, which was recently upgraded from a priority junction. Highways England provided the Technical Assessment report (*A120 Pellens Corner / Harwich Road Feasibility Study, 30 August 2013*).
- 6.3 The Technical Assessment report contains turning movements based on a SATURN model over a 12 hour period and the flows are provided in Passenger Car Units (PCUs). As part of that study, traffic surveys were undertaken on 12th and 13th June 2013 and Automatic Traffic Count (ATC) loops were placed on the wider road network for 3 weeks from the week commencing 10th June 2013. Table 6.1 shows the 12 hour SATURN flows at the A120 / Harwich Road junction.

Table 6.1: A120 – Harwich Road Junction SATURN Flows (12 Hour)

Link	Direction	12 Hour Turning Movements (PCUs)
A120	Eastbound Straight Ahead	3659
	Right Turn Harwich Road	558
	Westbound Straight Ahead	3846
	Left Turn Harwich Road	1572
Harwich Road	Right Turn Out A120	2035
	Left Turn Out A120	485

- 6.4 In addition to the above, ITL obtained ATC traffic counts on Harwich Road within the vicinity of it's junction with B1029 from ECC. The ATC counts were undertaken for 7 days in March and December 2017. Table 6.2 shows a summary of the traffic flows obtained from the ATC survey.



Table 6.2: Harwich Road ATC Survey Results

Link	Survey Start Date	Direction	AM Peak Hour (08:00 - 09:00)	PM Peak Hour (17:00 - 18:00)	12 Hour (07:00 - 19:00)
Harwich Road (East)	17 th March 2017	Eastbound	291	293	2621
		Westbound	351	409	2872
Harwich Road (West)	7 th Dec 2017	Eastbound	230	205	2015
		Westbound	295	270	2298

- 6.5 The average east and westbound flows on Harwich Road, calculated from the 2 above count sites are shown in Table 6.3

Table 6.3: Harwich Road Traffic Flows (Average)

Link	Direction	AM Peak Hour (08:00 - 09:00)	PM Peak Hour (17:00 - 18:00)	12 Hour (07:00 - 19:00)
Harwich Road	Eastbound	261	249	2318
	Westbound	323	340	2585

- 6.6 From the data shown in Table 6.3, the ratio of peak hour traffic levels relative to 12 hour levels were calculated and are shown in Table 6.4. The ratios were then applied to the 12 hour SATURN flows at the A120 /Harwich Road junction as relevant in order to derive the peak hour background assessment flows used in this study.

Table 6.4: 12 Hour to Peak Hour Conversion Factors

Direction	Period	Conversion Factor
Eastbound	12 Hour to AM Peak	0.1124
	12 Hour to PM Peak	0.1074
Westbound	12 Hour to AM Peak	0.1250
	12 Hour to PM Peak	0.1313

- 6.7 The development is proposed to open in 2023. The Local Highway Authority, Essex County Council, requires that capacity assessments on the local highway network are carried out 5 years post the completion of the development, i.e. 2028. However, DfT Circular 02/2013, Paragraph 25, requires assessments of highway capacity on the strategic road network to be undertaken for traffic flows 10 years post submission of a valid planning application, which in this case would be the year 2031. Therefore, in order to provide a robust assessment the junction capacity assessments at both junctions that are assessed as part of this study have been undertaken for the year 2031 with the development in place.



- 6.8 In order to raise the observed road network flows to the opening year (2023), 5 years post completion (2028) and assessment year (2031) of the development, growth factors were calculated from the latest versions of the National Transport Model (NTM) AF Dataset 2015 and TEMPRO 7.2. The relevant growth factors are shown in Table 6.5.

Table 6.5: NTM / TEMPRO Growth Factors

Growth Period	AM Peak Period (08:00–09:00)	PM Peak Period (17:00–18:00)
2013–2023	1.1201	1.1277
2013–2028	1.2006	1.2120
2013–2031	1.2262	1.2389

- 6.9 The forecast trips associated with the development were added to the future year *base flows* to assess the likely performance of the local road network following the opening of the proposed development. The *observed flows 2013*, *base flows 2023*, *base flows 2028*, *base flows 2031*, *proposed development traffic flows* and *base flows plus development traffic flows* are shown in Appendix E.
- 6.10 The aforementioned SATURN model flow data extracted from the HE technical assessment report assumed a 3 arm roundabout at the junction of Harwich Road and the A120 with the northern and southern sections of Harwich Road separating to the south of the junction. As such, it was necessary to compare ATC data for the Harwich Road northern and southern sections in order to calculate the likely routing of movements shown to turn into / out of Harwich Road within the SATURN model.

Network Assessment

- 6.11 The junction capacity assessments at each of the junctions listed at paragraph 6.1 are discussed separately below.

Junction 1: A120 / Harwich Road Roundabout Junction

- 6.12 The roundabout junction of the A120 / Harwich Road was assessed using the ARCADY software package within the Junctions 8 software suite. Junction assessment results are contained in Appendix F.
- 6.13 The results of the *2031 base* and *2031 base plus development* AM and PM peak hour ARCADY assessment results at the junction are summarised in Table 6.6. The assessment results show that the performance of the junction does not materially alter following the addition of the development traffic and that the maximum calculated queue



at the junction following the addition of the development traffic is 0.81 (1 PCU) and would occur during the PM peak hour on A120 North. The corresponding RFC (Ratio of Flow to Capacity), the measure of the traffic demand against the theoretical capacity is 0.45. As such it is considered that the junction would operate acceptably.

Table 6.6: ARCADY Assessment Results For Junction 1

Arm	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (16:30 – 17:30)	
	Max Queue	Max RFC	Max Queue	Max RFC
Base 2031				
A120 North	0.72	0.42	0.80	0.44
Harwich Road North	0.01	0.01	0.04	0.04
Harwich Road South	0.74	0.43	0.69	0.41
A120 South	0.51	0.34	0.48	0.33
Base 2031 + Development				
A120 North	0.76	0.43	0.81	0.45
Harwich Road North	0.01	0.01	0.04	0.04
Harwich Road South	0.77	0.43	0.82	0.45
A120 South	0.52	0.34	0.49	0.33

Junction 2: Site Access / Harwich Road Priority Junction

- 6.14 The priority junction of the site access / Harwich Road was assessed using the PICADY software package within the Junctions 8 software suite. Junction assessment results are contained in Appendix F.
- 6.15 The results of the *2031 base plus development* AM and PM peak hour PICADY assessment results at the junction are summarised in Table 6.7. The assessment results show that the maximum calculated queue at the junction is 1 PCU and would occur during the PM peak hour on the site access. The corresponding RFC (Ratio of Flow to Capacity), the measure of the traffic demand against the theoretical capacity is 0.15. As such it is considered that the junction would operate acceptably.



Table 6.7: PICADY Assessment Results For Junction 2

Arm	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (16:30 – 17:30)	
	Max Queue	Max RFC	Max Queue	Max RFC
Base 2031 + Development				
Site Access to Harwich Road	0.02	0.02	0.18	0.15
Harwich Road to Site Access	0.21	0.10	0.01	0.01



7 CAR PARKING PROVISION

7.1 Car parking provision plays an important role in the context of sustainability and is considered a vital measure in the process of moving towards sustainable development. The restraint in the supply of car parking can act as a potential tool for influencing travel choice towards non-car modes of travel for development sites, particularly those that benefit from high levels of accessibility by all transport modes.

7.2 Table 7.1 sets out the car and cycle parking standards for office use that are contained within the Essex Parking Standards: Design and Good Practice (September 2009).

Table 7.1: Essex Parking Standards

Use	Maximum Vehicle Provision	Minimum Cycle Provision	Minimum PTW Provision	Minimum Disabled Provision
Office	1 space per 30 sqm	1 space per 100 sqm for staff plus 1 space per 200 sqm for visitors	1 space, + 1 per 20 car spaces (for 1 st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	200 vehicle bays or less = 2 bays or 5% of total capacity, whichever is greater

Source: Essex Parking Standards: Design and Good Practice (September 2009)

7.3 Based on the total floor area of all aspects of the proposed development and the above parking standards, the permissible number of parking spaces that could be provided at the proposed development are shown in Table 7.2.

Table 7.2: Permissible parking provision for the proposed development.

Land Use	Area	Car Maximum	Cycle Minimum	PTW Minimum	Disabled Minimum
Office	3451	115	52	7	6

7.4 The layout plan at Appendix B shows that 116 car parking spaces including 12 disabled parking spaces would be provided.

7.5 As part of their pre-application response Tendring District Council indicated that if the parking provision at the development fell below the ECC standard requirement that improvement of the bus stops to the west of the site would be required. However, as the proposed car parking provision accords with the requirements of the ECC standards that requirement is not applicable.



8 CONCLUSIONS

- 8.1 Intermodal Transportation Ltd (ITL), an independent consultancy specialising in highway engineering and transportation planning, have been appointed by Brand Art to produce a Transport Assessment (TA) report to support a planning application for the provision of a commercial development at Alder Park, Harwich Road in Little Bentley. The scope of the study was discussed and agreed with Essex County Council as Local Highway Authority and Highways England as the responsible authority for maintaining the A120 trunk Road prior to the production of this report.
- 8.2 The site is located 8km to the east of Colchester and approximately 1.4km to the south-west of Little Bentley. The site is currently an open field and is approximately 5.2 hectares. Agricultural land is located to the south and to the east of the site. The western boundary is adjacent to Harwich Road. The site's northern boundary is formed by a farm house/cottages.
- 8.3 The development proposal involves the provision of 6 commercial blocks which would vary between 338 sqm and 733 sqm and which would have a total floor area of 3451 sq m. The proposed units would be utilised as offices. The site benefits from extant permission for an office scheme with a floor area of 1500 sqm, i.e. in the order of half of that currently proposed and as such the principle of commercial development at the site has already been established.
- 8.4 Vehicular access to the proposed development would be achieved via a new access forming a priority junction with Harwich Road. The current speed limit along Harwich Road, in the vicinity of the application site, is 60mph. The access would be 6.75m wide with 2m wide footways on either side. The proposed vehicular access would be located in approximately the same position as the access that was proposed in conjunction with the extant scheme at the site.
- 8.5 Given the rural location of the site, there are no facilities within the vicinity of the site. The site is, however, located close to National Cycle Route (NCR) 51, which passes along Harwich Road which is located immediately to the west of the site. Within the vicinity of the site, NCR 51 follows the route along Harwich Road and continues towards Elmstead Market and also provides a cycling link to Colchester.
- 8.6 The closest bus stop to the site is the Mary Lane bus stop located 940m to the south of site on Harwich Road. Given that this distance is beyond the maximum acceptable distance to access bus stops i.e. 800m, it is proposed that bus shelters would be



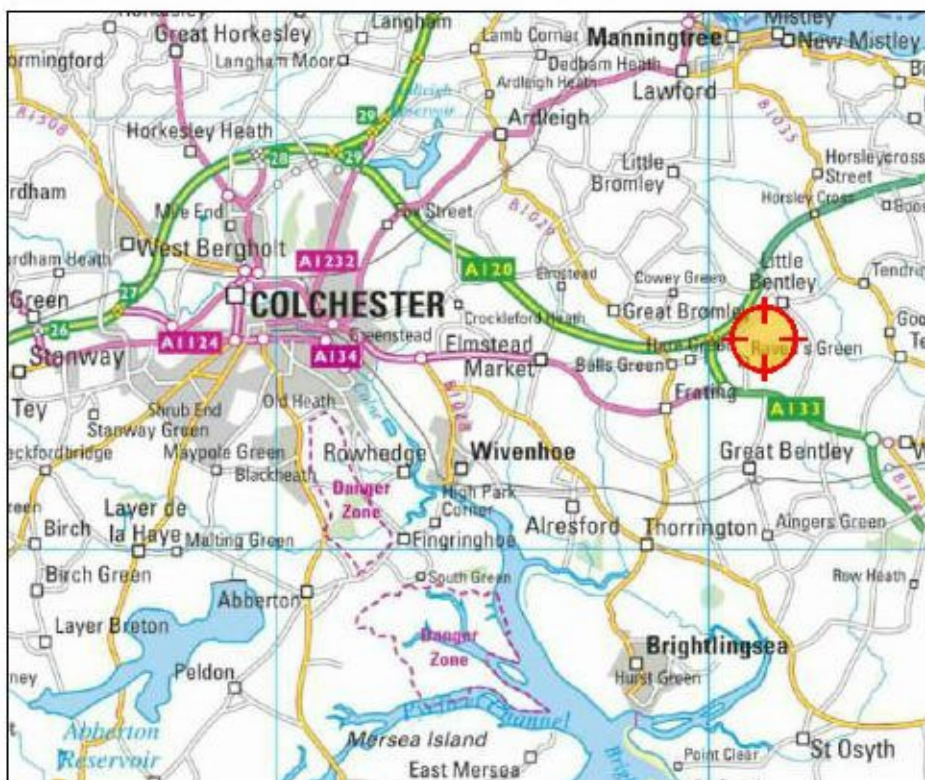
provided on both sides of Harwich Road within the vicinity of the site access. Bus services 105 and 107 currently pass the site and would call at the proposed bus stops adjacent to the site. Bus service 105 provides one trip every hour to Colchester. The closest railway station to the site is Colchester Town Railway Station and could be accessed from the site by bus service 105 and 107 which serve Stop B at Colchester Town railway station.

- 8.7 Using the TRICS database the likely levels of traffic that would be attracted to the proposed development have been calculated. The level of traffic attracted by the proposed development would be 83 movements in the weekday AM peak hour and 75 movements in the weekday PM peak hour. It is considered that those traffic levels should be viewed in the context that the site benefits from extant permission for an office scheme with a floor area that was approximately 44% of that of the current proposal. Therefore in very approximate terms the extant proposal would be likely to attract half of the traffic levels expected at the current proposal.
- 8.8 As agreed with ECC and Highways England during the scoping stage of this project, the performance of the following junctions has been assessed as part of this study:-
- Junction 1: A120 / Harwich Road Roundabout Junction
Junction 2: Site Access / Harwich Road Priority Junction
- 8.9 The junction capacity assessments at the above junctions confirm that the traffic associated with the development proposal would not have a material impact on the operation of the local road network.
- 8.10 It is confirmed within this report that, car, cycle and powered two wheeler parking at the development would be provided in accordance with the Essex Parking Standards: Design and Good Practice (September 2009) document.
- 8.11 Therefore, it is considered that in the context of the of paragraph 109 (page 32) of the National Planning Policy Framework 2019 (NPPF), which indicates that "*Development should only be prevented or refused on highway grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.*", the development proposal should be considered as acceptable.

DRAWINGS



WIDER CONTEXT



LOCAL CONTEXT



SITE LOCATION

IT Project:
**ALDER PARK,
HARWICH ROAD,
LITTLE BENTLEY**

Drawing Title:
**SITE LOCATION IN LOCAL
AND WIDER CONTEXT**

Sheet 1 of 1

Rev Description Date

Client:
BRAND ART LTD

Drawn By:
DS

Approved By:
JB

Drawing No:
IT2199/TA/01

CAD File:
IT2199/TA/01.DWG

A4

Notes:
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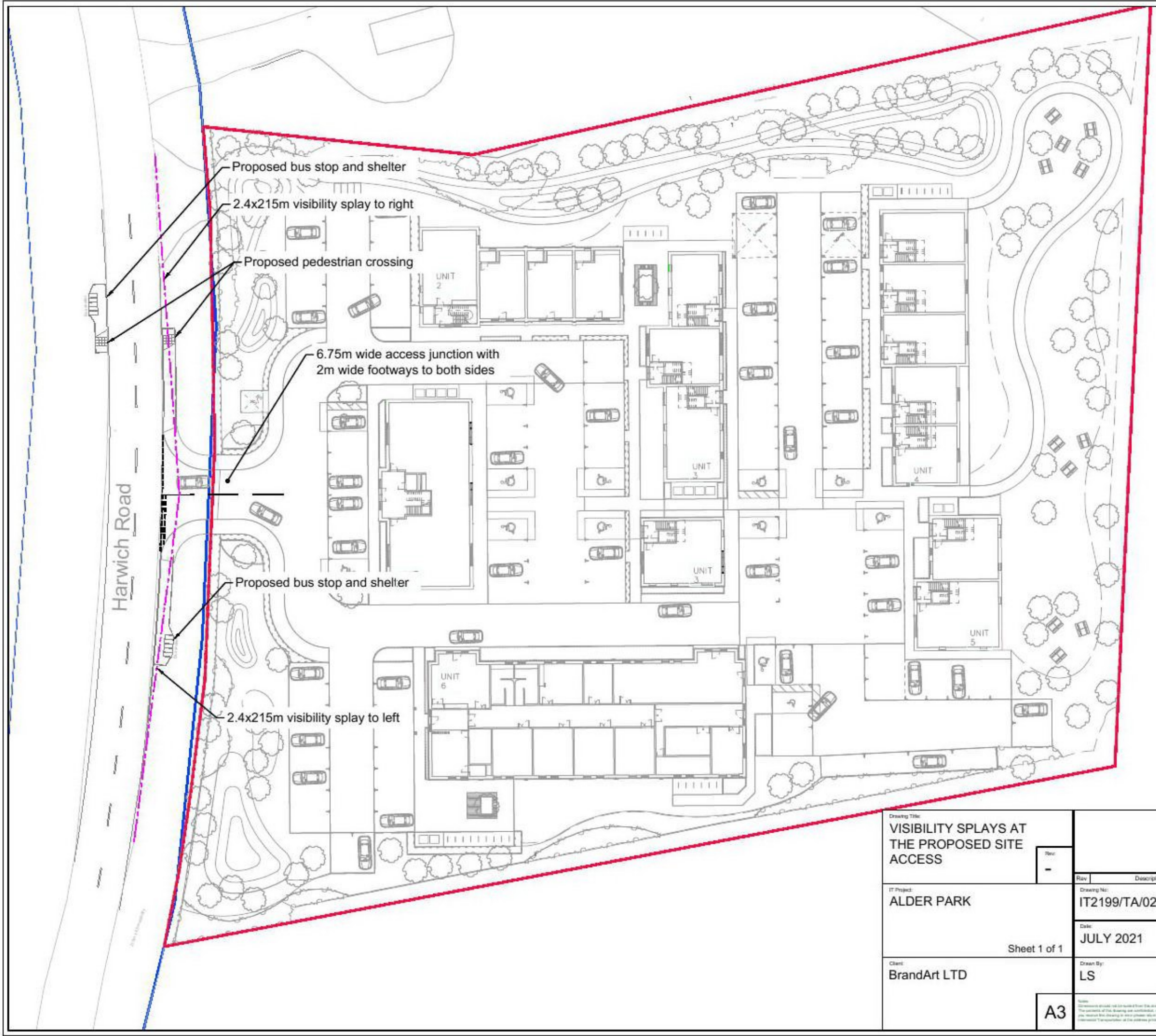
Date:
NOV 2020

Scale:
NTS




**Intermodal
TRANSPORTATION**

Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA



- Key**
- Land ownership boundary
 - Highway boundary

Drawing Title: VISIBILITY SPLAYS AT THE PROPOSED SITE ACCESS		Rev: -	
IT Project: ALDER PARK	Drawing No: IT2199/TA/02		CAD File: IT2199_SK01.DWG
	Date: JULY 2021		Scale: 1:500
	Drawn By: LS		Approved By: JB
Client: BrandArt LTD		Notes: <small>Drawings created and last modified from: This drawing The contents of this drawing are confidential, please do not release this drawing to other parties without I.T. Intermodal Transportation at the address provided.</small>	
Sheet 1 of 1		A3	



**Intermodal
TRANSPORTATION**

**Hunters Court
Debden road
Saffron Walden
Essex CB11 4AA**

APPENDIX A

SCOPING CORRESPONDENCE

Devesh Shrivastava

From: Chris Stoneham - Strategic Development Engineer
Sent: 25 February 2021 09:00
To: [REDACTED]
Subject: RE: LAND ADJACENT TO CLIP HEDGE FARM

Hi Devesh,

Many thanks for your email yesterday and the update regarding the discussions you have had with Highways England. It seems strange that a new junction has been designed without turning counts; as a result this seems to be one of the only options you have so I would accept this approach as a way forward.

I would imagine that this new junction would have sufficient capacity.

I hope this is helpful.

Regards

Chris Stoneham | Strategic Development Engineer
Strategic Development



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The Highway Authority is now charging for all pre-planning application advice, full details can be found here – [Pre-App Charging](#)

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From: Devesh Shrivastava <devesh.shrivastava@inter-modal.co.uk>
Sent: 24 February 2021 16:38
To: Chris Stoneham - Strategic Development Engineer <Chris.Stoneham@essex.gov.uk>
Cc: 'Justin Bass' <justin.bass@inter-modal.co.uk>; N.Naphtine@brandartuk.com; 'Graeme Roe' <graeme.roe@stanleybragg.co.uk>
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Chris

Further to our scoping email for this project and your subsequent correspondence / meeting with my colleague Justin Bass we would confirm that despite contacting numerous officers within Highways England (HE) thus far they have only been able to provide 12 hour turning movements from a SATURN model for the Harwich Road roundabout. As you will be aware, for our study we require the turning movements during the AM and PM peak

hours and we have communicated that to HE but it appears, unfortunately, that the data is unlikely to be available within the required time scales.

As such and given that it is not possible to undertake traffic counts at present due to the Covid19 pandemic, we propose to estimate peak hour flows from the 12 hour data that was included in the Technical Assessment report. Your colleague Paul Dolphin has provided traffic data for Harwich Road, within the vicinity of it's junction with the B1029. From that traffic count data, we are able to deduce the ratio of peak hour traffic levels relative to 12 hour levels and apply the calculated ratios to the 12 hour flows shown within the aforementioned Saturn model data to be entering / exiting Harwich Road at its roundabout junction with the A120 in order to derive an indication of the corresponding weekday AM and PM peak hour flows. It is considered that the derived flows would be acceptable for use in the PICADY assessment of the proposed site access junction.

Whilst writing we would confirm that we are also in discussion with HE in relation to adopting a similar approach as above in relation to traffic flows at the A120 / Harwich Road roundabout such that we can run an ARCADY assessment at the junction.

We trust that this message is sufficient for your immediate needs and welcome your earliest response. However, please do not hesitate to contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA



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From: Chris Stoneham - Strategic Development Engineer
[REDACTED]
Sent: 10 November 2020 15:03
To: Neil Napthine; 'Justin Bass'
Cc: Claire Ruse - Strategic Development Engineer
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM
Attachments: IT2199_TA_01.pdf

Neil, Justin,

Many thanks for your time earlier and as promised I just wanted to clarify the points we discussed at the meeting for this site, they are:

- In respect to the proposed TA report the bullet points contained in Devesh's email dated 5 November will form the basis of the report.
- Not a requirement to include injury accident data for the site as discussed and established at the meeting as data appears to pre-date the introduction of the new roundabout.
- It was agreed no additional speed surveys will be required in respect to the site entrance as this is staying the same as per the previous application. Plus it was felt that the desired minimum visibility splay of 2.4m x 215m in both directions can be achieved for the site access.
- As it is anticipated that 80% of the traffic generated for the site will come from the north (via the A120) it was felt that no capacity assessments for any additional junctions to the south of the site need to be incorporated within the TA.
- Again, due to the above, a ghosted right turn lane for the site access on Harwich Road is not seen as a requirement.
- CS will discuss the extent of adoption of the highway infrastructure for part of the site with Essex Highways.
- The provision of bus stop infrastructure in the vicinity of the site access on Harwich Road together with footways leading into the site should be carried over from the previous application.
- In addition to the above and we briefly touched on this during the meeting the provision of workplace Travel Plans (for employment sites with 50 or more employees) could be a requirement. Essex County Council's Travel Plan team is willing to help with the preparation and the details for any plan.
- On Traffic data this will be obtained from Highways England in the first instance.
- One additional point based on the discussions earlier and on the information provided below the total floor area for the new application will be 4,000 sq. m.

I hope I have covered the key points that we discussed during the meeting, if there is anything I have missed off or feel needs adding please come back to me.

Kind Regards

Chris Stoneham | Strategic Development Engineer
Transportation and Smarter Travel



Safer, greener, healthier

Devesh Shrivastava

From: Devesh Shrivastava [REDACTED]
Sent: 23 March 2021 13:09
To: 'Mark'
Cc: 'Justin Bass'; 'Cuthbert, Andrew'
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hi Mark

Thank you for your reply. We will ensure that the TA addresses the comments in relation to our scoping email.

With regards to the roundabout modelling, please could you advise, whether you would be able to obtain the traffic data and the ARCADY model from a contact within Highways England, as the previous contacts that you provided to us were not able to provide it to us. If not, we would look to derive traffic flows from a combination of the data provided by ECC, the Web TRIS data and the data contained within the 2013 Technical Assessment Report and we will build our own ARCADY model.

We would be grateful for your urgent response and we will look forward to hearing back from you. However, please contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA



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From: Norman, Mark [REDACTED]
Sent: 23 March 2021 11:36

Cc: 'Justin Bass' <[REDACTED]>; Cuthbert, Andrew <[REDACTED]>

Subject: RE: LAND ADJACENT TO CLIP HEDGE FARM

Devesh,

Thank you for your email, just for clarification I requested AECOM to give me some advice on which I have recently received.

As regards the A120/ Harwich Road roundabout, as far as I am aware, AECOM do not hold traffic flow or OS mapping for this roundabout. AECOM were not the scheme designers and, as far as I know, didn't carry out any traffic forecasting or junction capacity modelling in respect of this junction.

As regards the derivation of traffic flows suitable to model the A120/ Harwich Road roundabout, the traffic flows contained in the 2013 Technical Assessment Report are not suitable for this purpose. Firstly, these are forecast flows from at least eight years ago; secondly the report only contains 12-hour flows and not weekday peak hour flows; finally it appears that the scheme was still at option identification stage when this report was written and it may not be the case that the flows contained in the report relate directly to the option that was ultimately built.

There are a number of sources of data that Intermodal could try: the email below suggests that Essex County Council have traffic flow data on the Harwich Road immediately to the south-west of the roundabout; there are also WebTris sites 6291/1 and 6292/2 which are located on the A120 immediately to the west of the roundabout. Both of these have data for a significant proportion of 2019, which would allow a pre-pandemic neutral month set of data to be obtained. However, these are only ever going to provide a partial source of turning movement data for the roundabout itself.

Considering the period in between publication of the 2013 TAR and the construction of the roundabout in 2017 - 2019, there must surely have been an exercise in junction capacity modelling, which would have involved the collection of fresh data, the production of design year traffic turning movements and an ARCADY model. Otherwise, how could the roundabout have been designed and how could it have been confirmed as having sufficient capacity to accommodate forecast growth in the A120 corridor? If it was available, the provision of the actual ARCADY model that was used to justify the design of the implemented scheme would also allow Intermodal to avoid having to build their own model, and would provide us with a model that represented Highways England's official position on the roundabout's capacity. Even if the ARCADY model was not available, the traffic flows (raw data and/or forecast turning movements) used in the design would be worth obtaining.

As regards the study scope set out in the email dated 5th November, I have a number of suggestions which are annotated in red on the email at the bottom of this chain.

Regards

Mark

Mark Norman

Spatial Planner

Network Operations

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

[REDACTED]
GTN: 0300 470 4938

From: Devesh Shrivastava [REDACTED]
Sent: 18 March 2021 10:57
To: Norman, Mark <[REDACTED]>
Cc: 'Justin Bass' [REDACTED]
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mark

Following our conversation previously, please could you advise whether you have had the opportunity to contact AECOM to obtain the traffic data and OS mapping for the A120-Harwich Road roundabout. Whilst writing, for the record, please could you confirm that the study scope as set out within my email below and dated 5th November 2020 is acceptable.

We trust that this information is sufficient, however, please contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

Intermodal
TRANSPORTATION

Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA



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From: Devesh Shrivastava [REDACTED]
Sent: 24 February 2021 16:25
To: 'Mark' [REDACTED]
Cc: 'N.Napthine@brandartuk.com' [REDACTED]; 'Graeme Roe' [REDACTED]
[REDACTED] Justin Bass' [REDACTED]
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mark

Further to our scoping email and your correspondence with Mindy Bhogal regarding the traffic data at the A120 – Harwich Road roundabout, Mindy provided the Technical Assessment report as attached.

The report contains turning movements based on the SATURN model over a 12 hour period. However, for our study we require the turning movements during the AM and PM peak hours and having communicated that to Mindy we have been passed onto four different officers within Highways England in an attempt to obtain the data. It appears, unfortunately though, that the data is unlikely to be available within the required time scales.

As such and given that it is not possible to undertake traffic counts at present due to the Covid19 pandemic, we propose to estimate peak hour flows from the 12 hour data that was included in the Technical Assessment report. Essex County Council have indicated that they hold traffic data for Harwich Road, within the vicinity of it's junction with the B1029. From that traffic count data, we would be able to deduce the ratio of peak hour traffic levels relative to 12 hour levels and apply the calculated ratios to the 12 hour turning movements on the A120-Harwich Road junction in order to derive an indication of the weekday AM and PM peak hour flows at the roundabout. The turning proportions at the junction during both peak hours would be constant, however, the values would be different. Adopting that approach would not provide an accurate indication of the performance of the junction but it would enable us to run a capacity assessment.

We trust that this message is sufficient for your immediate needs and welcome your earliest response. Whilst writing, for the record, please could you confirm that the study scope as set out within my email below and dated 5th November 2020 is acceptable.

Please do not hesitate to contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
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From: Norman, Mark [REDACTED]
Sent: 09 December 2020 12:01
To: Bhogal, Mindy [REDACTED]
Cc: [REDACTED]
Subject: RE: LAND ADJACENT TO CLIP HEDGE FARM

Mindy,

Thank you; any info you can find would be extremely useful

Regards

Mark

Mark Norman
Spatial Planner
Network Operations
Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW
[REDACTED]

From: Bhogal, Mindy
Sent: 09 December 2020 11:48
To: Norman, Mark [REDACTED]
Subject: RE: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mark,

I'm sorry but I haven't had a chance to look into this, I wasn't involved in the scheme until it was well into construction so cannot confirm whether the information is available but will try and look at it later today.

Regards,

Mindy Bhogal, Project Manager
Concrete Roads, East Region
Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW
[REDACTED]

From: Norman, Mark
Sent: 09 December 2020 10:32
To: Bhogal, Mindy [REDACTED]
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Mindy,

Did you get anywhere locating the modelling info for the design of the recently built roundabout at Pellens Corner

Regards

Mark

Mark Norman

Spatial Planner

Network Operations

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

From: Devesh Shrivastava [REDACTED]

Sent: 07 December 2020 14:29

To: Norman, Mark [REDACTED]

Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mark

Further to our previous correspondence, please could you confirm whether you have had the opportunity to consider our scoping email below and if you would be able to provide contact details in order to obtain traffic data as previously discussed.

We welcome your earliest response. However, please contact us if you have any queries or wish to discuss this matter further.

Regards

Devesh

Devesh Shrivastava

Assistant Transport Planner

on behalf of

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From: Devesh Shrivastava [REDACTED]
Sent: 05 November 2020 11:24
To: 'Mark' [REDACTED]
Cc: 'Justin Bass' [REDACTED]; 'N.Napthine@brandartuk.com' [REDACTED]
'Graeme Roe' <[REDACTED]>
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mark

Further to our recent telephone conversation, we write in order to set out the proposed scope of the Transport Assessment (TA) report that we are instructed to produce in conjunction with the proposal for the provision of a commercial development on land located adjacent to Clip Hedge Farm, Harwich Road, Little Bentley CO7 8SZ. The site location in the local and wider context is shown in attached Drawing IT2199/TA/01.

Permission was granted for the provision of 2 buildings for 1500 sqm of B1 Office on appeal in May 2020 (appeal ref: APP/P1560/W/19/3226387) after the original application dated 13th November 2017 (Ref 17/02014/FUL) was refused. Following discussions with the Local Planning Authority, a new application is now proposed to provide 2 office buildings at the site each of circa 1,100 sq m along with a further 3 Class E-light industrial/office buildings with a total floor area of circa 2,800 sq m.

In the light of the abovementioned recently approved scheme at the site it is apparent that the principle of commercial development on this site has been accepted. It is considered that the current proposal should be considered in the context that a similar, albeit slightly smaller, scheme has recently been approved on the site.

We propose that the TA report would include the following.

- Description of the site location and local road network;
- Assessment of accessibility of the site by non-car modes of travel;
- Confirmation / justification of the vehicular access arrangements including undertaking Auto-Track swept path assessments;
- Calculation of the likely level of traffic attracted to the development proposal with reference to the TRICS database during the typical road network weekday AM and PM peak hours; - **all agreed to here**
- Distribution of the development traffic onto the highway network; **[please state the method proposed – for example, use of 2011 census journey-to-work data for workplaces within the MSOA containing the site, or based on existing turning movement patterns observed at the A120/ Harwich Road roundabout].**
- Capacity assessment of the following junctions for the typical weekday AM and PM peak hours for the assumed opening year and 5 years post opening; **[this should be 'opening year and 10 years post planning application or end of Local Plan' (see Circular 02/2013 paras 25 and 27)]**
 - Proposed Site Access Junction
 - A120 / Harwich Road Roundabout Junction – **given the scale of development proposed, this would appear to be the only location on the SRN that would need to be examined.**
- **Consideration of 5 years' (*) collision data at the above locations, including analysis of any apparent patterns or clusters**
(*) – this should be limited to the period between the opening of the roundabout to traffic (August 2019?? – please confirm) and the end of February 2020 so as to exclude the effects of the Covid 19 Pandemic. It might only be possible to obtain 6 months of data September 2019 to February 2020 inclusive – this may not be sufficient to allow any conclusions to be drawn but this should be acknowledged in the TA]
- Consideration of the appropriate parking provision at the development proposal in the context of the relevant local standards.
- **Consideration of the impact of this development on walking, cycling and horse riding. The site is almost adjacent to the A120/ Harwich Road roundabout – what would be the impact of this development on pedestrian and cycle movements at the junction and on users of the existing facilities.**

It is proposed that a standalone Travel Plan Framework would be prepared and submitted with the planning application.

As discussed over the phone, the A120 / Harwich Road roundabout junction was recently constructed and it is our understanding that the junction was modelled by AECOM as part of that process. As such, we would be grateful if you could provide a contact at AECOM in order that we can obtain the base traffic flows that they used in the assessment of the junction such that we can use them in our assessments for this scheme.

Please note that we have contacted Essex County Council separately in order to agree the scope of the necessary investigations in the context of the County road network.

We trust that this information is sufficient. We welcome your earliest response and look forward to hearing back from you. Please contact us if you have any queries.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

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Devesh Shrivastava

From: Devesh Shrivastava <[REDACTED]>
Sent: 12 February 2021 09:34
To: [REDACTED]
Subject: FW: [External] FW: LAND ADJACENT TO CLIP HEDGE FARM
Attachments: Pellens Atkins Technical Assessment Report v3.pdf

Hi Nigel

Further to Karl's email below, we appreciate that you received our request just yesterday. However, given that we requested the data before Christmas and require it at the earliest opportunity, please could you advise whether you would be able to provide it.

We had initially requested Highways England to provide the base traffic flows used in the assessment of the A120 / Harwich Road roundabout junction. Mindy provided the Technical Assessment report as attached. The report contains turning movements based on the SATURN model over a 12 hour period and we require the turning movements during the AM and PM peak hours. Please could you advise, whether it would be possible to extract the peak hour turning flows from the traffic survey data, as explained in Paragraphs 2.3 and 2.4 or could it be obtained from the SATURN model.

We trust that this information is sufficient and welcome your earliest response. However, please contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

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From: Brooks, Karl [REDACTED]
Sent: 11 February 2021 16:15
[REDACTED]
Cc: 'Justin Bass' [REDACTED]; Bhogal, Mindy [REDACTED]
Subject: RE: [External] FW: LAND ADJACENT TO CLIP HEDGE FARM

Hi Devesh,

I understand that Mindy has either forwarded your query or is redirecting you to Nigel Allsopp in our route management team [REDACTED]
[REDACTED] The scheme has now been handed back into maintenance and so Nigel and / or his team should be able to access any data we have in relation to the traffic data.

Kind Regards

Karl

Karl Brooks, Programme Delivery Manager
Concrete Roads, East Region
Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW
[REDACTED]

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Customer Contact Centre is available 24/7 on [REDACTED]

From: Devesh Shrivastava [REDACTED]
Sent: 11 February 2021 15:40
To: Brooks, Karl [REDACTED]
Cc: 'Justin Bass' [REDACTED]
Subject: FW: [External] FW: LAND ADJACENT TO CLIP HEDGE FARM

Hi Karl

Further to Mindy's email below, we understand that you received our request just two days ago. However, given that we requested the data before Christmas and require it at the earliest opportunity, please could you advise whether you would be able to provide it.

We welcome your earliest response and look forward to hearing back. However, please contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava

Assistant Transport Planner
on behalf of

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From: Bhogal, Mindy [REDACTED]
Sent: 09 February 2021 13:11
To: Brooks, Karl [REDACTED]
Cc: [REDACTED]
Subject: RE: [External] FW: LAND ADJACENT TO CLIP HEDGE FARM

Karl,

I am unable to assist Devesh, can you please advise to whom this request for information should be forwarded to.

Regards,

Mindy Bhogal, Project Manager
Concrete Roads, East Region
Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

[REDACTED]

From: Devesh Shrivastava [REDACTED]
Sent: 08 February 2021 14:38
To: Bhogal, Mindy [REDACTED]
Subject: FW: [External] FW: LAND ADJACENT TO CLIP HEDGE FARM

Hi Mindy

Further to Pei Lin's reply below, please could you advise whether it would be possible to provide the traffic data as requested in my email dated 19th January. Please see email chain below for ease of reference.

We understand that you do not directly hold the traffic data. However, given time constraints and deadline in issuing our report, we would be grateful if you could provide the data at your earliest opportunity.

We trust that this information is sufficient and look forward to hearing back. However, please contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

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From: Pei Lin Cheong [REDACTED]
Sent: 03 February 2021 13:45
To: [REDACTED] Bhogal, Mindy [REDACTED]
Cc: 'Justin Bass' [REDACTED]
Subject: FW: [External] FW: LAND ADJACENT TO CLIP HEDGE FARM

Hi Devesh,

Apologies for not replying sooner. My role is the ECC PM so the function is for contract administration and this is beyond my remit.

Mindy, I would appreciate if you could please direct Devesh who is the best person to liaise with.

Thanks,
Pei Lin

Pei Lin Cheong

Senior Quantity Surveyor
BSc (Hons) MCInstCES NECREg

Arup

Arup Campus Blythe Gate Blythe Valley Park Solihull B90 8AE United Kingdom

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From: Devesh Shrivastava [REDACTED]
Sent: 03 February 2021 13:08
To: Pei Lin Cheong [REDACTED]
Cc: 'Justin Bass' [REDACTED]
Subject: [External] FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Pei Lin

Further to Mindy's email below, please could you advise whether you would be able to provide the traffic data at the A120 / Harwich Road roundabout junction. We had initially requested Highways England to provide the base traffic flows used in the assessment of the junction.

Mindy provided the Technical Assessment report as attached. The report contains turning movements based on the SATURN model over a 12 hour period and we require the turning movements during the AM and PM peak hours. Please could you advise, whether it would be possible to extract the peak hour turning flows from the traffic survey data, as explained in Paragraphs 2.3 and 2.4 or could it be obtained from the SATURN model.

We trust that this information is sufficient and welcome your earliest response. However, please contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

Intermodal
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Hunters Court
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From: Bhogal, Mindy [REDACTED]
Sent: 26 January 2021 13:36
[REDACTED]
Cc: Pei Lin Cheong [REDACTED]
Subject: RE: LAND ADJACENT TO CLIP HEDGE FARM

Hi Devesh,

The PM currently dealing with all enquiries on this project is Pei Lin Cheong.

Pei Lin – Please can you provide the traffic data requested.

Regards,

Mindy Bhogal, Project Manager
Concrete Roads, East Region
Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW
[REDACTED]

From: Devesh Shrivastava [REDACTED]
Sent: 26 January 2021 11:31
To: Bhogal, Mindy [REDACTED]
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mindy

Further to the information provided, please could you advise whether you have had the opportunity to consider our request below.

We welcome your earliest response. However, please contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA



e [REDACTED]

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From: Devesh Shrivastava [REDACTED]
Sent: 19 January 2021 12:06
To: [REDACTED]
Cc: 'Justin Bass' [REDACTED] 'Mark' [REDACTED]
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mindy

Thank you for your reply. We have had a look through the Technical Report and it contains turning movements based on the SATURN model. However, these appear to be over a 12 hour period and we require the turning movements during the AM and PM peak hours. Please could you advise, whether it would be possible to extract the peak hour turning flows from the traffic survey data, which are explained in Paragraphs 2.3 and 2.4 or could it be obtained from the SATURN model.

Additionally, please could you confirm whether, the Harwich Road junction on the first row of Table 4.4 refers to the junction which was upgraded from the priority junction to the roundabout.

We trust that this information is sufficient. However, please contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA



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From: Bhogal, Mindy [REDACTED]
Sent: 19 January 2021 10:35
To: [REDACTED]
Cc: 'Justin Bass' [REDACTED]
Subject: RE: LAND ADJACENT TO CLIP HEDGE FARM

Good morning Devesh,

Apologies for the significant delay in responding to you. I have located the attached technical report; please let me know if it doesn't contain the information you're looking for.

Regards

Mindy Bhogal, Project Manager
Concrete Roads, East Region
Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

From: Devesh Shrivastava [REDACTED]
Sent: 19 January 2021 09:28
To: Bhogal, Mindy [REDACTED]
Cc: 'Justin Bass' [REDACTED]
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mindy

Further to our conversation last week, please could you advise whether you have had the opportunity to obtain the modelling data.

We welcome your earliest response. However, please contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of



[REDACTED]

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From: Norman, Mark [REDACTED]
Sent: 09 December 2020 12:01
To: Bhogal, Mindy [REDACTED]
Cc: [REDACTED]
Subject: RE: LAND ADJACENT TO CLIP HEDGE FARM

Mindy,

Thank you; any info you can find would be extremely useful

Regards

Mark

Mark Norman

Spatial Planner

Network Operations

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

From: Bhogal, Mindy
Sent: 09 December 2020 11:48
To: Norman, Mark [REDACTED]
Cc: [REDACTED]
Subject: RE: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mark,


I'm sorry but I haven't had a chance to look into this, I wasn't involved in the scheme until it was well into construction so cannot confirm whether the information is available but will try and look at it later today.

Regards,

Mindy Bhogal, Project Manager


Concrete Roads, East Region

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW



From: Norman, Mark

Sent: 09 December 2020 10:32

To: Bhogal, Mindy 

Cc: 

Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Mindy,

Did you get anywhere locating the modelling info for the design of the recently built roundabout at Pellens Corner

Regards

Mark

Mark Norman

Spatial Planner


Network Operations

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW



From: Devesh Shrivastava 

Sent: 07 December 2020 14:29

To: Norman, Mark 

Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mark

Further to our previous correspondence, please could you confirm whether you have had the opportunity to consider our scoping email below and if you would be able to provide contact details in order to obtain traffic data as previously discussed.

We welcome your earliest response. However, please contact us if you have any queries or wish to discuss this matter further.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

Intermodal
TRANSPORTATION

Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA



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From: Devesh Shrivastava [REDACTED]
Sent: 05 November 2020 11:24
To: 'Mark' [REDACTED]
Cc: 'Justin Bass' [REDACTED]
'Graeme Roe' <[REDACTED]>
Subject: FW: LAND ADJACENT TO CLIP HEDGE FARM

Hello Mark

Further to our recent telephone conversation, we write in order to set out the proposed scope of the Transport Assessment (TA) report that we are instructed to produce in conjunction with the proposal for the provision of a commercial development on land located adjacent to Clip Hedge Farm, Harwich Road, Little Bentley CO7 8SZ. The site location in the local and wider context is shown in attached Drawing IT2199/TA/01.

Permission was granted for the provision of 2 buildings for 1500 sqm of B1 Office on appeal in May 2020 (appeal ref: APP/P1560/W/19/3226387) after the original application dated 13th November 2017 (Ref 17/02014/FUL) was refused. Following discussions with the Local Planning Authority, a new application is now proposed to provide 2 office buildings at the site each of circa 1,100 sq m along with a further 3 Class E-light industrial/office buildings with a total floor area of circa 2,800 sq m.

In the light of the abovementioned recently approved scheme at the site it is apparent that the principle of commercial development on this site has been accepted. It is considered that the current proposal should be considered in the context that a similar, albeit slightly smaller, scheme has recently been approved on the site.

We propose that the TA report would include the following.

- Description of the site location and local road network;
- Assessment of accessibility of the site by non-car modes of travel;
- Confirmation / justification of the vehicular access arrangements including undertaking Auto-Track swept path assessments;
- Calculation of the likely level of traffic attracted to the development proposal with reference to the TRICS database during the typical road network weekday AM and PM peak hours;
- Distribution of the development traffic onto the highway network;
- Capacity assessment of the following junctions for the typical weekday AM and PM peak hours for the assumed opening year and 5 years post opening;
 - Proposed Site Access Junction
 - A120 / Harwich Road Roundabout Junction
- Consideration of the appropriate parking provision at the development proposal in the context of the relevant local standards.

It is proposed that a standalone Travel Plan Framework would be prepared and submitted with the planning application.

As discussed over the phone, the A120 / Harwich Road roundabout junction was recently constructed and it is our understanding that the junction was modelled by AECOM as part of that process. As such, we would be grateful if you could provide a contact at AECOM in order that we can obtain the base traffic flows that they used in the assessment of the junction such that we can use them in our assessments for this scheme.

Please note that we have contacted Essex County Council separately in order to agree the scope of the necessary investigations in the context of the County road network.

We trust that this information is sufficient. We welcome your earliest response and look forward to hearing back from you. Please contact us if you have any queries.

Regards
Devesh

Devesh Shrivastava
Assistant Transport Planner
on behalf of

Intermodal
TRANSPORTATION

Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA



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APPENDIX B

PROPOSED SITE LAYOUT



Clip Hedge Farm

Harwich Road

Pond

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SCHEDULE OF ACCOMMODATION		
UNIT	GIA (SQM)	GIA (SQFT)
UNIT 1		
00 - GROUND FLOOR	279 m ²	3004 ft ²
01 - FIRST FLOOR	279 m ²	3004 ft ²
02 - SECOND FLOOR	174 m ²	1877 ft ²
	733 m ²	7885 ft ²
UNIT 2		
00 - GROUND FLOOR	274 m ²	2948 ft ²
01 - FIRST FLOOR	84 m ²	903 ft ²
	358 m ²	3851 ft ²
UNIT 3		
00 - GROUND FLOOR	321 m ²	3456 ft ²
01 - FIRST FLOOR	362 m ²	3902 ft ²
	684 m ²	7358 ft ²
UNIT 4		
00 - GROUND FLOOR	366 m ²	3940 ft ²
01 - FIRST FLOOR	318 m ²	3419 ft ²
	684 m ²	7358 ft ²
UNIT 5		
00 - GROUND FLOOR	179 m ²	1924 ft ²
01 - FIRST FLOOR	176 m ²	1884 ft ²
	352 m ²	3789 ft ²
UNIT 6		
00 - GROUND FLOOR	661 m ²	7110 ft ²
	661 m ²	7110 ft ²
GRAND TOTAL	3451 m ²	37141 ft ²

Parking Schedule	
PARKING TYPE	QUANTITY
Car Parking Space	104
Disable Car Parking Space	12
Cycle Parking Space	54
PTW Parking Space	4

C	Entrance barrier relocated	VT	27.07.21
REV	DESCRIPTION	DRN	DATE
DRAWING STATUS PRELIMINARY			

STANLEY BRAGG
architects

STANLEY BRAGG ARCHITECTS LIMITED
PARPUS HOUSE, FIRST FLOOR, TOLLGATE WEST, COLCHESTER,
ESSEX, CO1 8AG. T: 0206 913131

CLIENT
Brandart Ltd

PROJECT
Alder Park, Little Bentley

DRAWING
Proposed Site Plan - 1:250

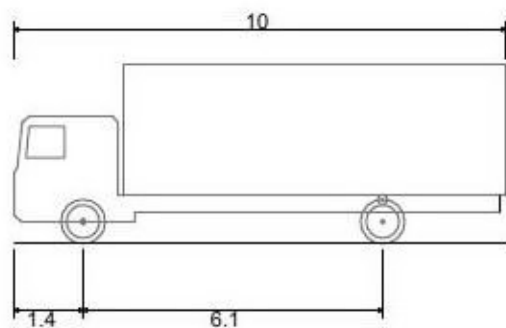
SCALE 1:250 @ A1	DRAWN VT	CHKD GR
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DATE
05/24/21

DRAWING NUMBER
6793-1120-C

APPENDIX C

AUTO TRACK SWEPT PATH SKETCHES



FTA Design HG Rigid Vehicle (1998)

Overall Length	10.000m
Overall Width	2.500m
Overall Body Height	3.645m
Min Body Ground Clearance	0.440m
Track Width	2.470m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	11.000m

Harwich Road

FTA DESIGN HG RIGID VEHICLE ACCESSING SITE

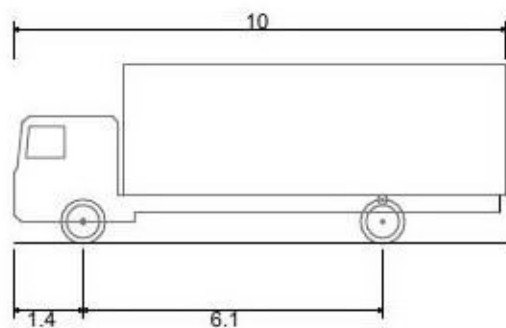
NTS

ATR100

Harwich Road

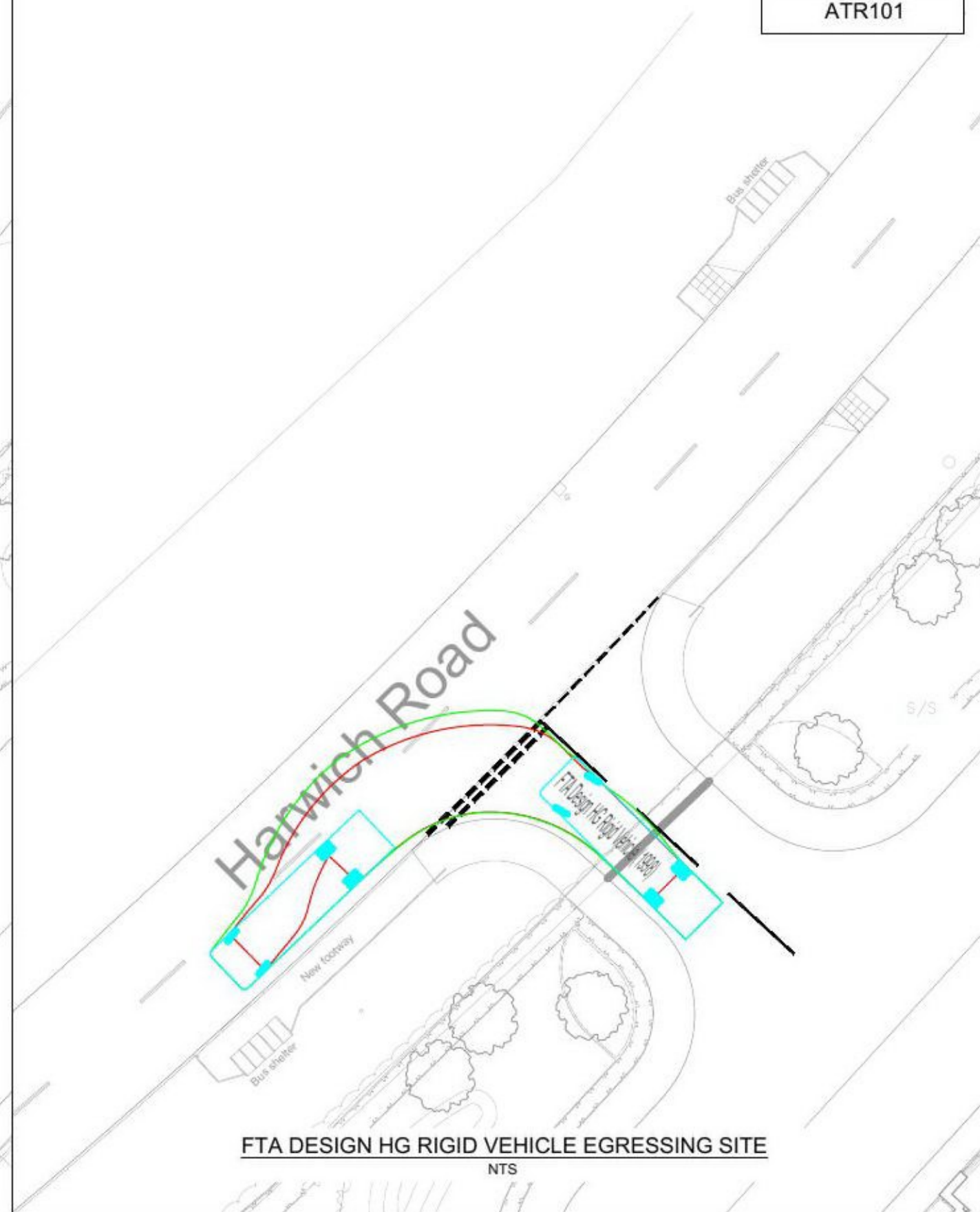
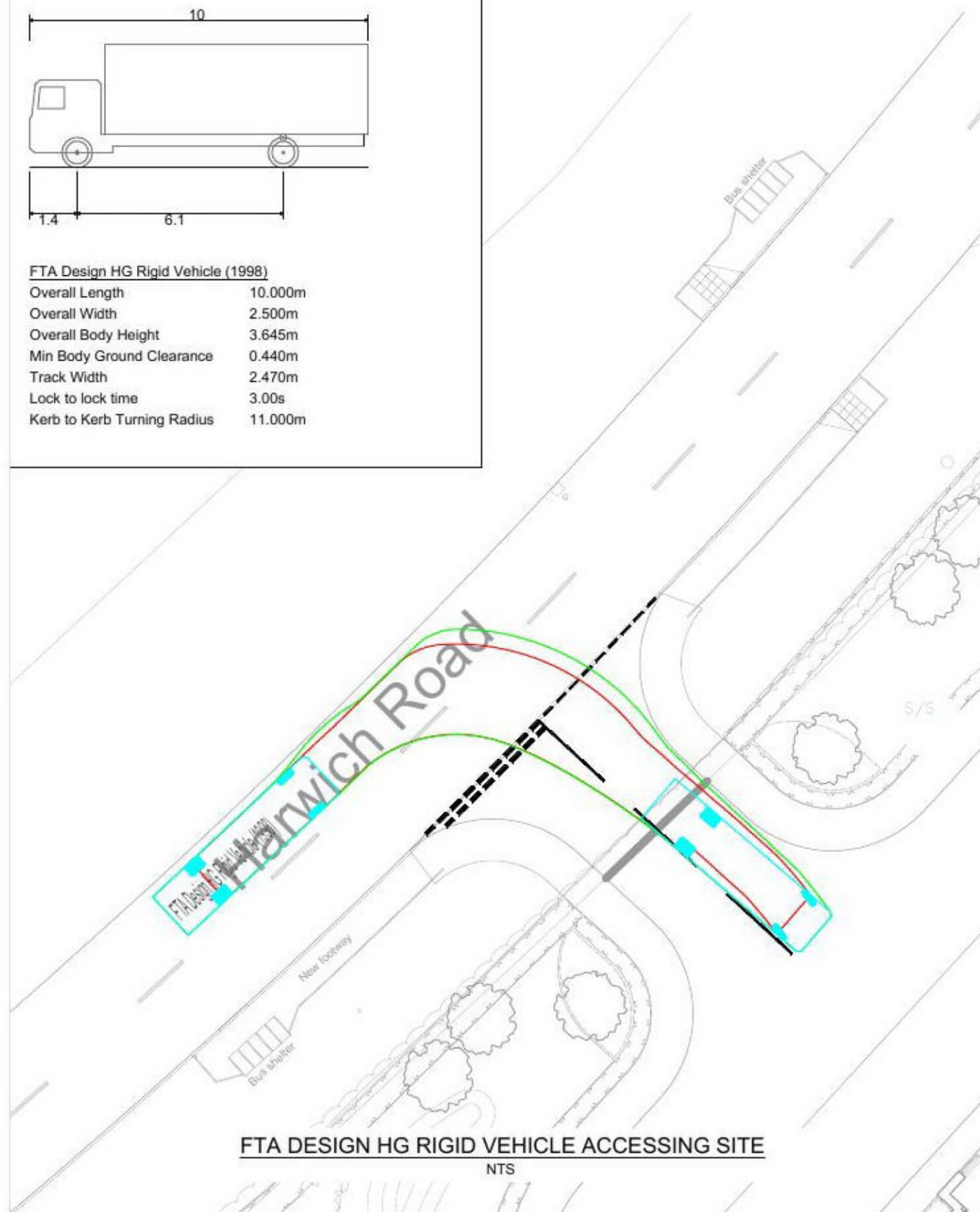
FTA DESIGN HG RIGID VEHICLE EGRESSING SITE

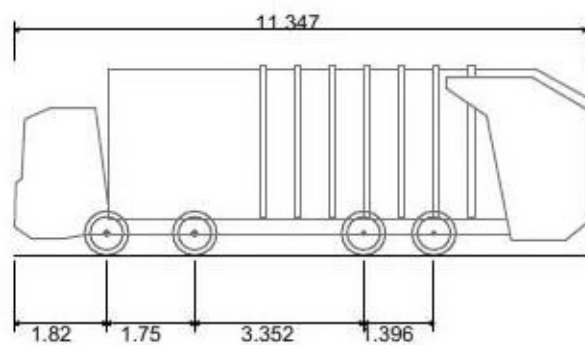
NTS



FTA Design HG Rigid Vehicle (1998)

Overall Length	10.000m
Overall Width	2.500m
Overall Body Height	3.645m
Min Body Ground Clearance	0.440m
Track Width	2.470m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	11.000m





Large Refuse Vehicle (4 axle)

Overall Length	11.347m
Overall Width	2.500m
Overall Body Height	3.751m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock to lock time	6.00s
Wall to Wall Turning Radius	11.330m

Harwich Road

LARGE REFUSE VEHICLE (4-AXLE) ACCESSING SITE

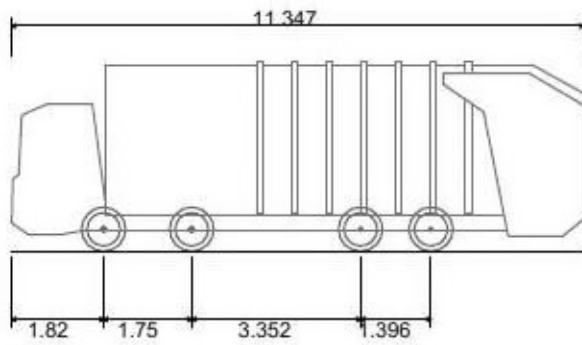
NTS

ATR102

Harwich Road

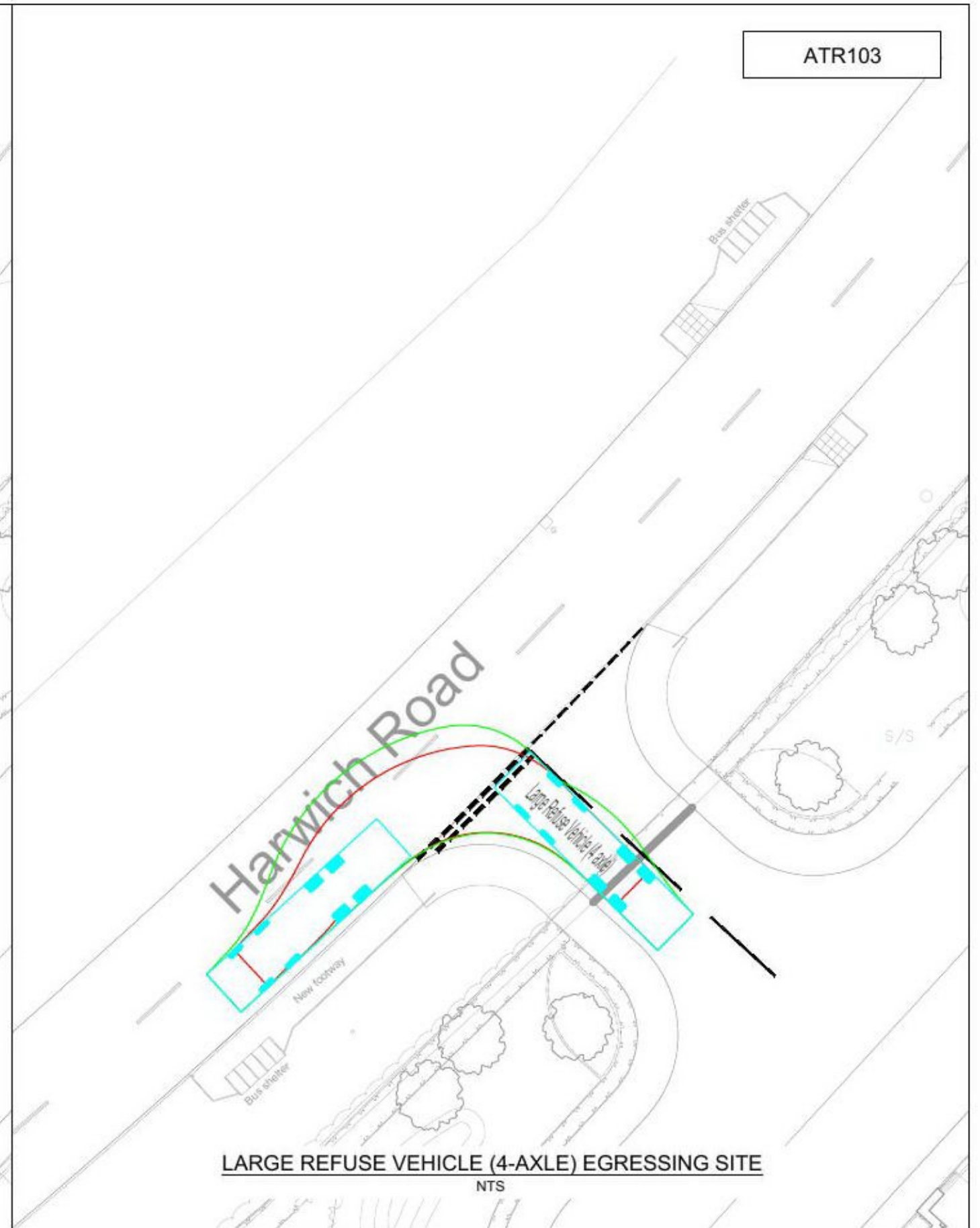
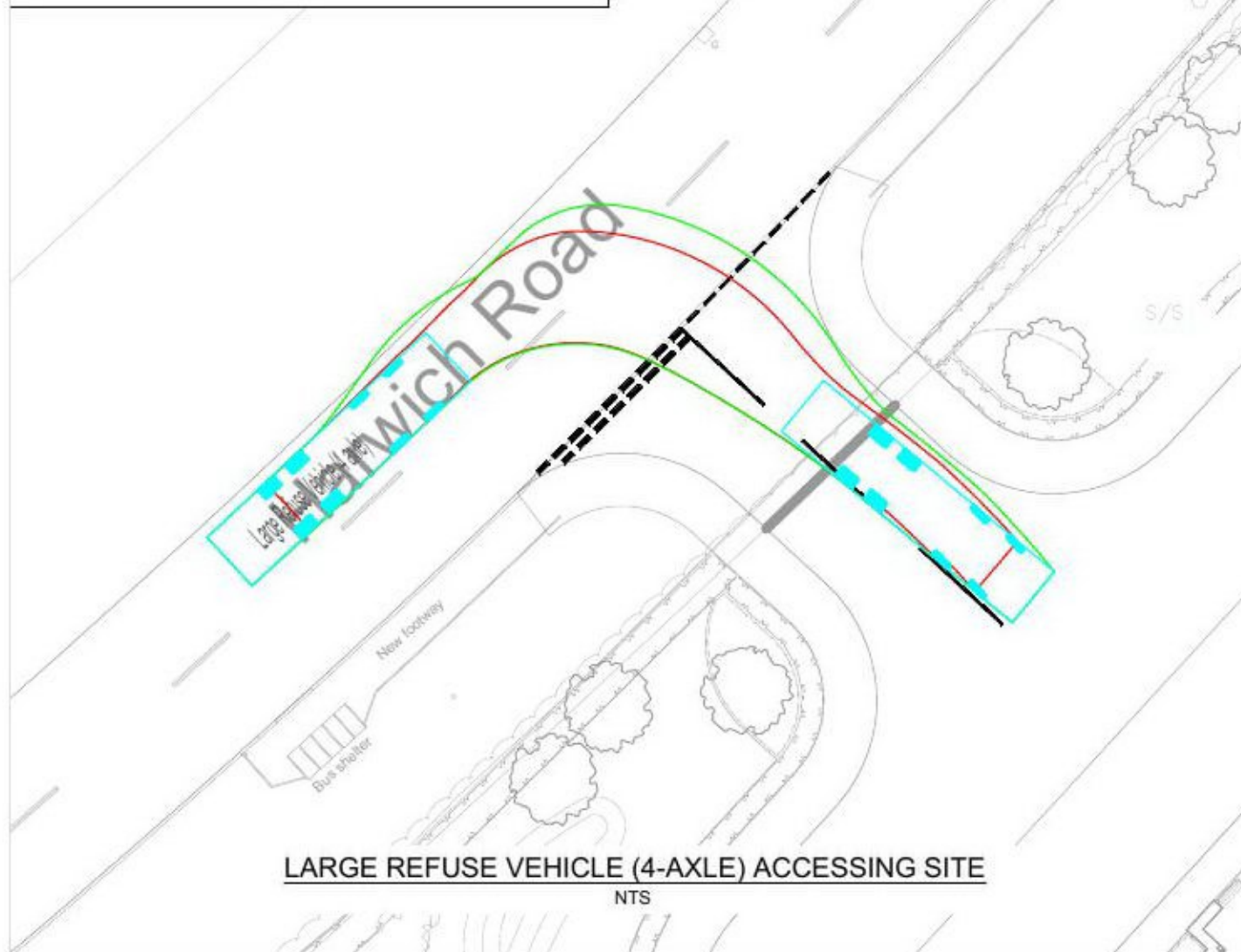
LARGE REFUSE VEHICLE (4-AXLE) EGRESSING SITE

NTS



Large Refuse Vehicle (4 axle)

Overall Length	11.347m
Overall Width	2.500m
Overall Body Height	3.751m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock to lock time	6.00s
Wall to Wall Turning Radius	11.330m



APPENDIX D

TRICS PRINTOUTS

Calculation Reference: PLDCT-731011-201104-1120

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use: 03 - EMPLOYMENT
Category: B - BUSINESS PARK

TOTAL VEHICLES

Selected regions and areas:

06	WEST MIDLANDS		
	WO WORCESTERSHIRE		1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY WEST YORKSHIRE		1 days
08	NORTH WEST		
	GM GREATER MANCHESTER		1 days

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

Primary 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: Gross floor area
Actual Range: 1251 to 12077 (units: sqm)
Range Selected by User: 575 to 12500 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision

Selection by: ☒ Include all surveys

Date Range: 01/01/50 to 31/12/15

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:

Tuesday	1 days
Thursday	1 days
Friday	1 days

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

Selected survey types:

Manual count	1 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 undertaken using machines.

Selected Locations:

Neighbourhood Centre (PPS6 Local Centre)	1
Free Standing (PPS6 Out of Town)	1

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:

Industrial Zone	1
Village	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:

B1	1 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®.

Filter by Use Class Breakdown:

All Surveys Included

Secondary Filtering selection (Cont.):Population Within 500m Range:

All Surveys Included

Population Within 1 mile:

1,001 or less 1 days

1,001 to 5,000 1 days

5,001 to 15,000 1 days

*This data displays the number of selected surveys within stated 1-mile radii of population.*Population Within 5 miles:

5,001 to 25,000 1 days

25,001 to 75,000 1 days

75,001 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:

1.5 to 1.0 2 days

1.0 to 0.5 1 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 Plans:

Not known 1 days

No 2 days

*This data displays the number of surveys within the selected sector that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.*FTAL Rating:

No FTAL Present 1 days

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

LIST OF SITES relevant to selection parameters

1	GM-02-B-01	BUSINESS PARK	GREATER MANCHESTER
	MANCHESTER ROAD NEAR MANCHESTER DARRINGTON Free Standing (PPS6 Out of Town) Industrial Zone Total Gross floor area: 12177 sqm Survey date: FRIDAY 01/06/19 Survey Type: MANUAL		
2	WO-02-B-02	BUSINESS PARK	WORCESTERSHIRE
	BIRMINGHAM ROAD NEAR BROMSGROVE LICKLEY END Neighbourhood Centre (PPS6 Local Centre) Village Total Gross floor area: 4187 sqm Survey date: TUESDAY 25/06/19 Survey Type: MANUAL		
3	WY-02-B-03	BUSINESS PARK	WEST YORKSHIRE
	SCOTT PARK LANE WETHERBY KIRK DEIGHTON Neighbourhood Centre (PPS6 Local Centre) Village Total Gross floor area: 1381 sqm Survey date: THURSDAY 15/06/19 Survey Type: MANUAL		

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.

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TRIP RATE for Land Use 12 - EMPLOYMENT/B - BUSINESS PARK

TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFP	Trip Rate	No. Days	Ave. GFP	Trip Rate	No. Days	Ave. GFP	Trip Rate
10:00 - 10:30									
10:30 - 11:00									
11:00 - 11:30									
11:30 - 12:00									
12:00 - 12:30									
12:30 - 13:00									
13:00 - 13:30									
13:30 - 14:00									
14:00 - 14:30									
14:30 - 15:00									
15:00 - 15:30									
15:30 - 16:00									
16:00 - 16:30									
16:30 - 17:00									
17:00 - 17:30	3	8848	1 450	3	8848	1 046	3	8848	1 456
17:30 - 18:00	3	8848	1 570	3	8848	1 057	3	8848	1 627
18:00 - 18:30	3	5848	1,106	3	8848	1 137	3	5848	1,243
18:30 - 19:00	3	8848	1 054	3	8848	1 113	3	8848	1 157
19:00 - 19:30	3	8848	1 554	3	8848	1 154	3	8848	1 758
19:30 - 20:00	3	8848	1 450	3	8848	1 171	3	8848	1 621
20:00 - 20:30	3	8848	1 211	3	8848	1 171	3	8848	1 352
20:30 - 21:00	3	8848	1 211	3	8848	1 155	3	8848	1 376
21:00 - 21:30	3	8848	1 158	3	8848	1 159	3	8848	1 357
21:30 - 22:00	3	8848	1 215	3	8848	1 177	3	8848	1 352
22:00 - 22:30	3	8848	1 245	3	8848	1 445	3	8848	1 650
22:30 - 23:00	3	8848	1 352	3	8848	1 516	3	8848	1 918
23:00 - 23:30	3	8848	1 359	3	8848	1 255	3	8848	1 654
23:30 - 24:00	3	8848	1 353	3	8848	1 256	3	8848	1 649
24:00 - 24:30	3	8848	1 258	3	8848	1 152	3	8848	1 450
24:30 - 25:00	3	8848	1 274	3	8848	1 217	3	8848	1 451
25:00 - 25:30	3	8848	1 150	3	8848	1 258	3	8848	1 428
25:30 - 26:00	3	8848	1 171	3	8848	1 311	3	8848	1 512
26:00 - 26:30	3	8848	1 177	3	8848	1 547	3	8848	1 724
26:30 - 27:00	3	8848	1 150	3	8848	1 724	3	8848	1 854
27:00 - 27:30	3	8848	1 155	3	5848	0,997	3	8848	1 152
27:30 - 28:00	3	8848	1 137	3	8848	1 844	3	8848	1 951
28:00 - 28:30	3	8848	1 074	3	8848	1 274	3	8848	1 348
28:30 - 29:00	3	8848	1 058	3	8848	1 274	3	8848	1 342
29:00 - 29:30									
29:30 - 30:00									
30:00 - 30:30									
30:30 - 31:00									
31:00 - 31:30									
31:30 - 32:00									
32:00 - 32:30									
32:30 - 33:00									
33:00 - 33:30									
33:30 - 34:00									
Total Rates:			8,342			7,540			15,552

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 columns) 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.

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Parameter summary

This rate parameter range selected:	1251 - 13077 (units: scm)
Survey date date range:	11/01/90 - 21/11/19
Number of weekdays (Monday-Friday):	0
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 shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

APPENDIX E

TRAFFIC FLOW DIAGRAMS

Diagram illustrating the layout of the Harwich Road and A120 junction (J1) and the Harwich Road and A120 junction (J2). The diagram shows the layout of the roads, the junctions, and the traffic flow. It includes data tables for the number of heavy goods vehicles (HGVs) and total vehicles for each approach and departure. The legend indicates that the top row of each table represents the number of HGVs and the bottom row represents the total number of vehicles.

Junction 1 (J1): Harwich Road and A120

Approach from A120 (North):

0	411
0	2
0	61
0	0

Approach from Harwich Road (East):

0	0
7	0
2	0
0	0

Approach from Harwich Road (South):

0	0
251	0

Approach from A120 (South):

0	0	0	0
14	461	191	6

Junction 2 (J2): Harwich Road and A120

Approach from Harwich Road (North):

0	0
281	0
0	0

Approach from A120 (South):

0	0
0	0

Site:

Site

Legend:

- Number of HGVs
- Total Vehicles

Diagram illustrating the road network around the J1 roundabout, showing traffic flow and vehicle counts (HGVs and Total Vehicles) for various approaches.

Legend:

- Number of HGVs (Blue cells)
- Total Vehicles (White cells)

Approaches and Traffic Light Data:

- Approach from the North (Hanwich Road):**

0	0	0	0
15	505	188	19
- Approach from the East (Hanwich Road):**

0	0
20	0
6	0
0	0
- Approach from the South (Hanwich Road):**

0	0
242	0
- Approach from the West (A120):**

0	993
0	5
0	55
0	0
- Approach from the South-East (Hanwich Road):**

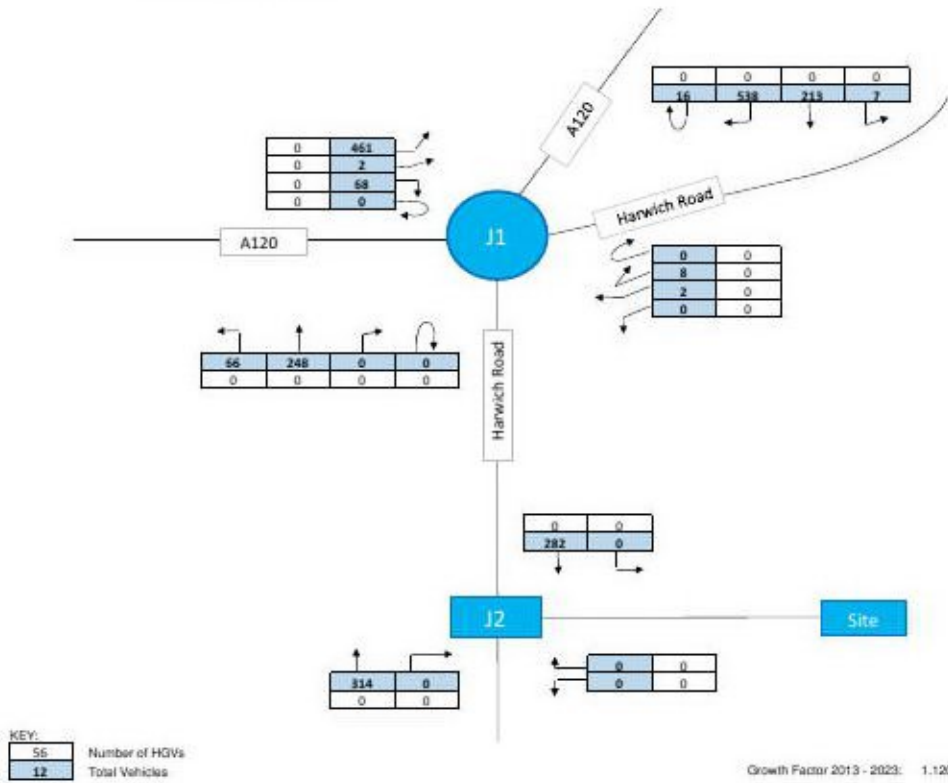
58	199	0	0
0	0	0	0
- Approach from the South-West (Hanwich Road):**

257	0
0	0

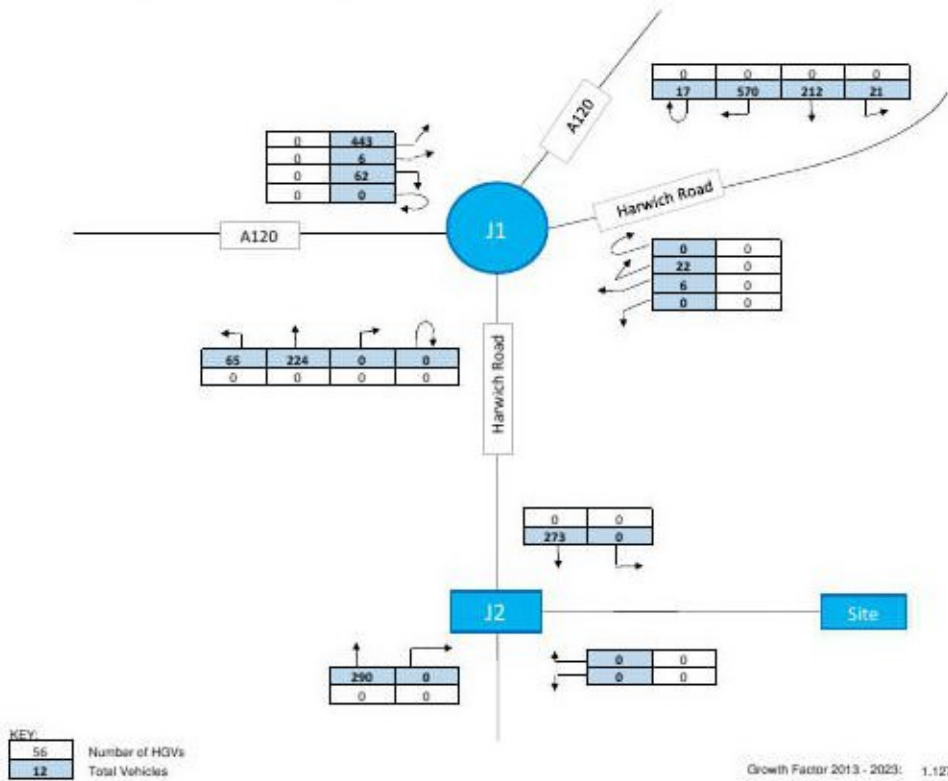



Intermodal
TRANSPORTATION
HARDY, COAST
Deliden Road
Lafayette, WA 98520
509.831.6666

08:00-09:00 AM PEAK HOUR

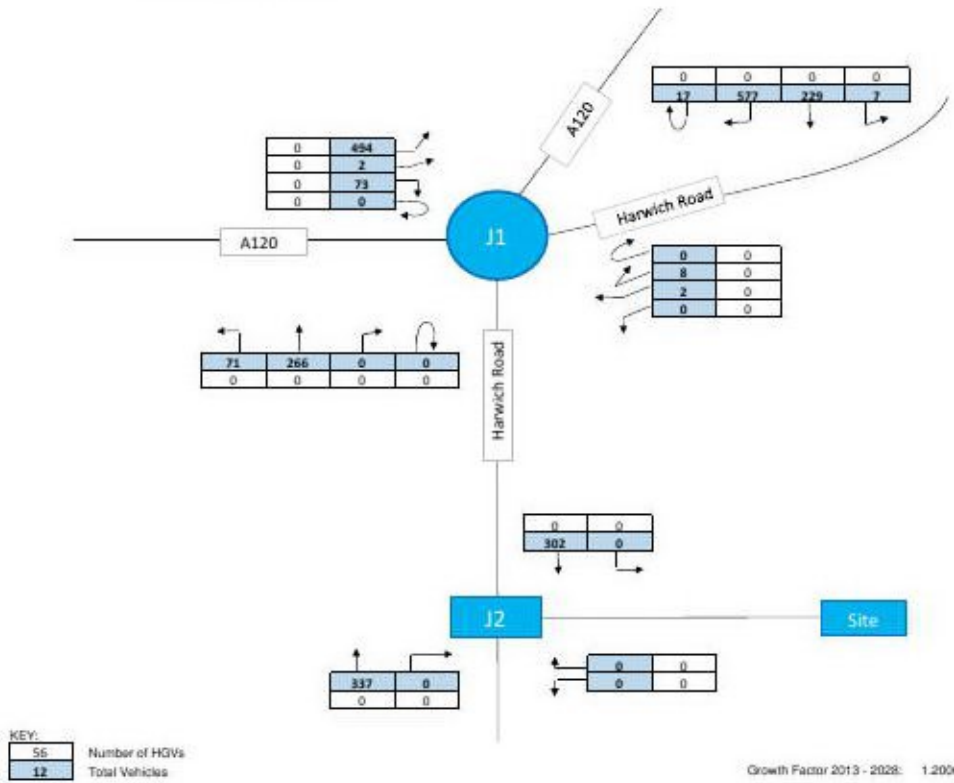


17:00-18:00 PM PEAK HOUR

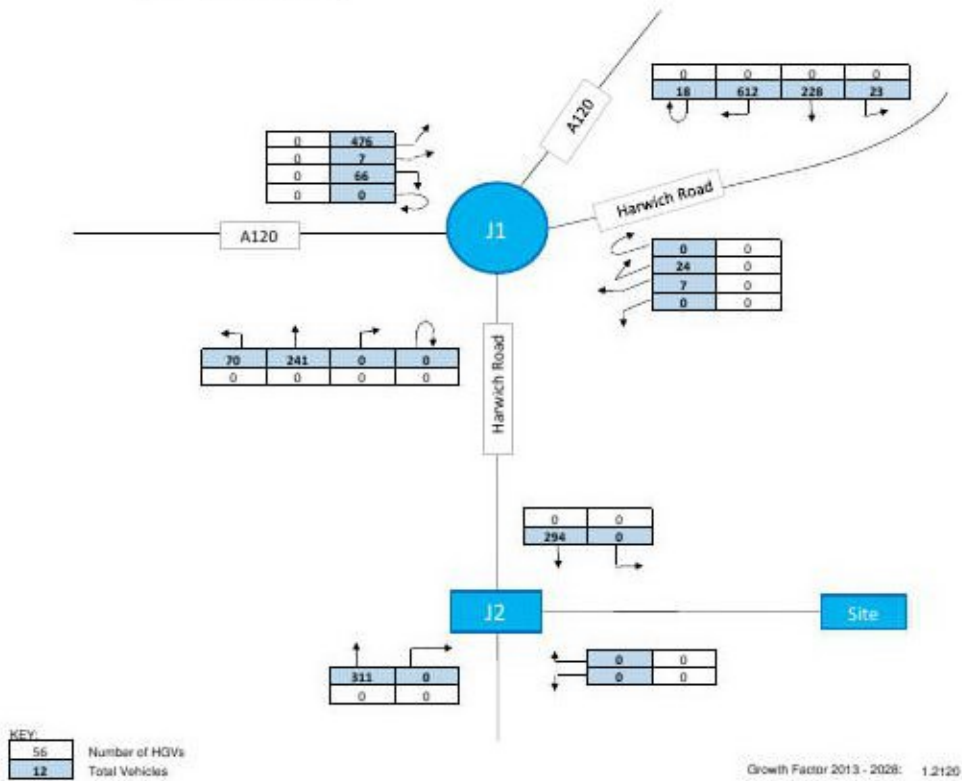


IT PROJECT: ALDER PARK, HARWICH ROAD, LITTLE BENTLEY, COLCHESTER		Rev: Description Date		 Intermodal TRANSPORTATION Harwich Road Little Bentley Colchester Essex CB3 1AB
Drawing Title: BASE TRAFFIC FLOWS 2023	Drawing No: TRAFFIC FLOW DIAGRAM 2	Date: Oct-20		
Client: BRAND ART LTD	Drawn By: DS	Approved By : JB		

08:00-09:00 AM PEAK HOUR

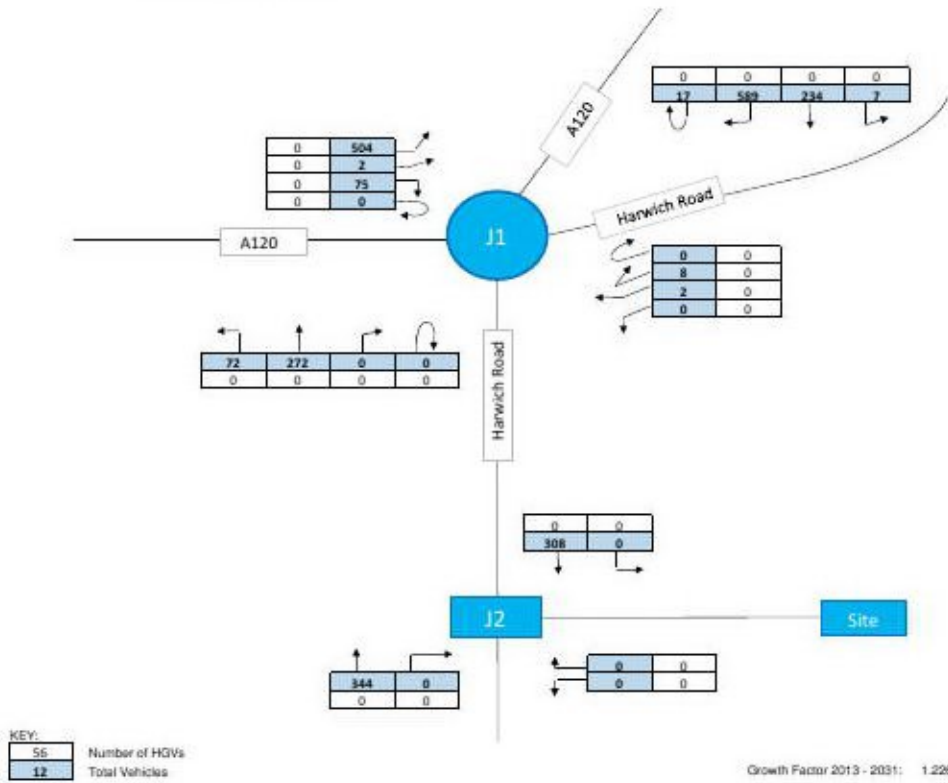


17:00-18:00 PM PEAK HOUR

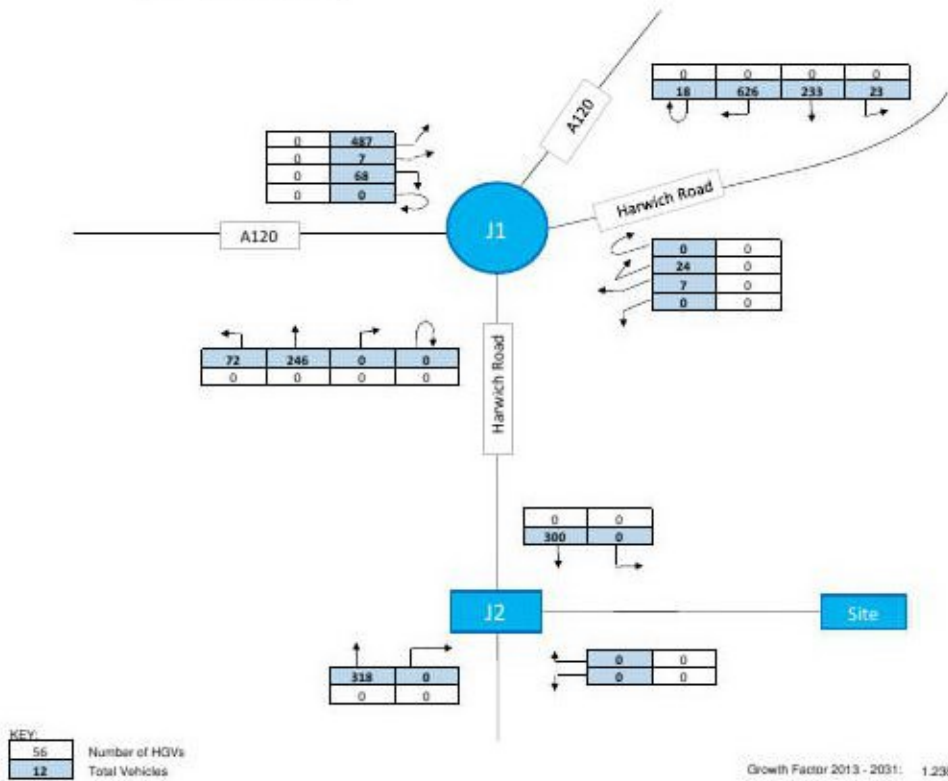



IT PROJECT: ALDER PARK, HARWICH ROAD, LITTLE BENTLEY, COLCHESTER		Rev: <input type="text"/> Description: <input type="text"/> Date: <input type="text"/>	
Drawing Title: BASE TRAFFIC FLOWS 2025	Drawing No: TRAFFIC FLOW DIAGRAM 3	Date: Oct-20	
Client: BRAND ART LTD	Drawn By: DS	Approved By: JB	

08:00-09:00 AM PEAK HOUR

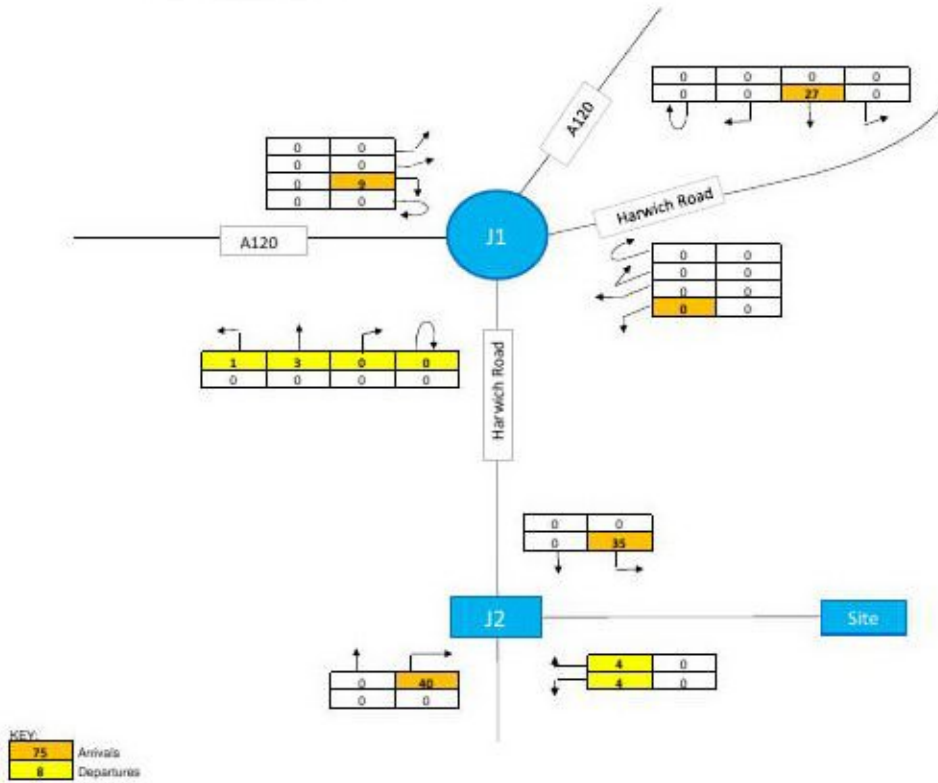


17:00-18:00 PM PEAK HOUR

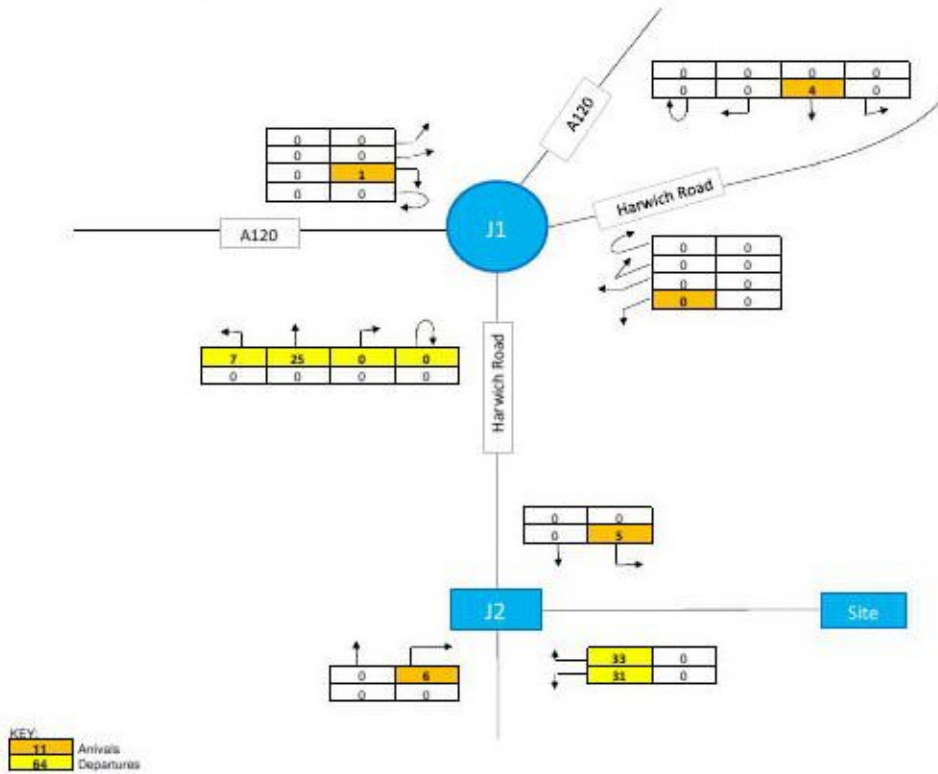



IT PROJECT: ALDER PARK, HARWICH ROAD, LITTLE BENTLEY, COLCHESTER		Rev: Description Date		 intermodal TRANSPORTATION NUMBER 1 COURT Dedden Road Sutton-Warley Leam CV31 3HA
Drawing Title: BASE TRAFFIC FLOWS 2031		Drawing No: TRAFFIC FLOW DIAGRAM 4 Date: Oct-20		
Client: BRAND ART LTD		Drawn By: DS Approved By : JB		

08:00-09:00 AM PEAK HOUR

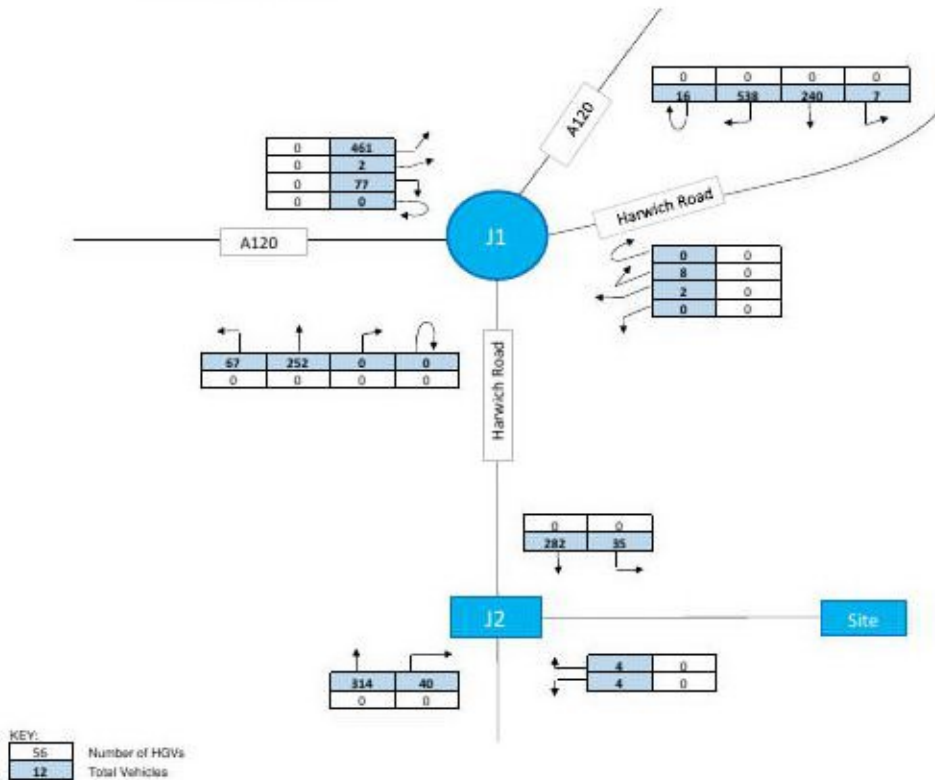


17:00-18:00 PM PEAK HOUR

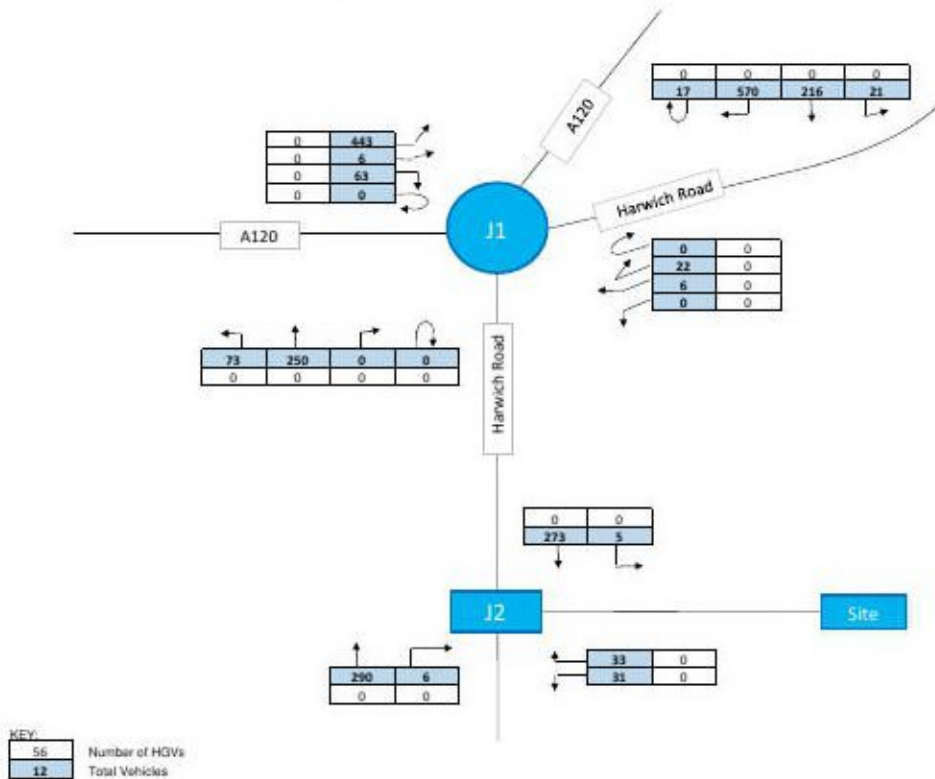


IT PROJECT: ALDER PARK, HARWICH ROAD, LITTLE BENTLEY, COLCHESTER	Rev: _____ Description: _____ Date: _____	 Intermodal TRANSPORTATION HARWICH ROAD LITTLE BENTLEY Colchester, Essex CB3 5AA
Drawing Title: DEVELOPMENT TRAFFIC FLOWS	Drawing No: TRAFFIC FLOW DIAGRAM 5	
Client: BRAND ART LTD	Drawn By: DS	
	Approved By: JB	


08:00-09:00 AM PEAK HOUR



17:00-18:00 PM PEAK HOUR



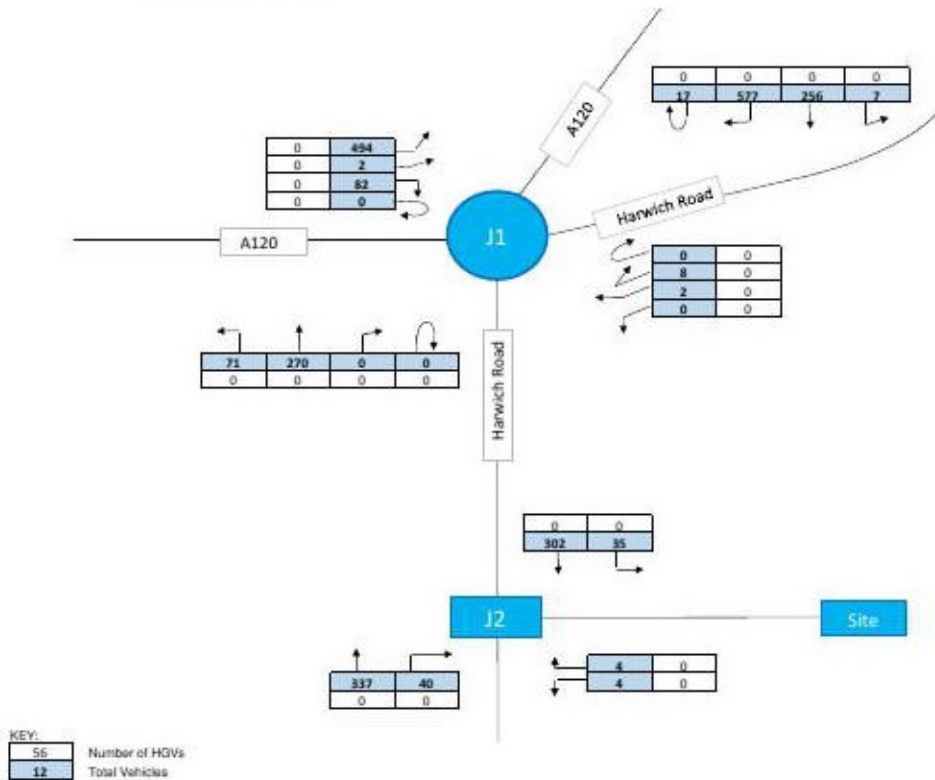
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Drawing Title: BASE 2023 + DEVELOPMENT TRAFFIC FLOWS		Drawing No: TRAFFIC FLOW DIAGRAM 5	Date: Oct-20		
Client: BRAND ART LTD		Drawn By: DS	Approved By : JB		



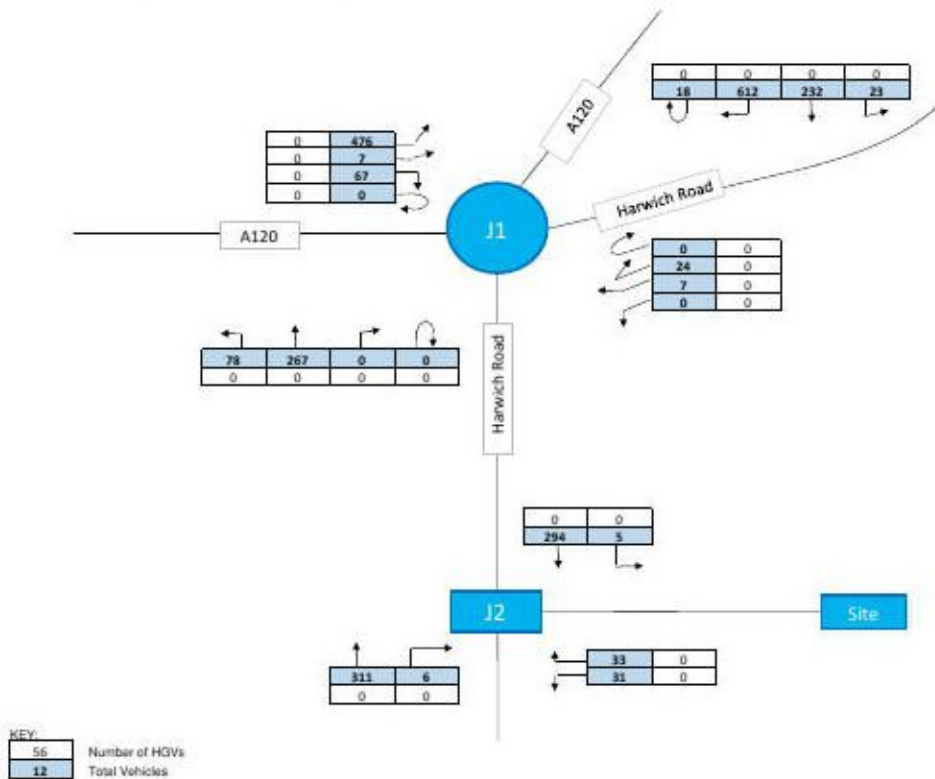
intermodal
TRANSPORTATION
HARBOR COURT
Dedden Road
Sutton-Warley
Leam CE11 0AB



08:00-09:00 AM PEAK HOUR



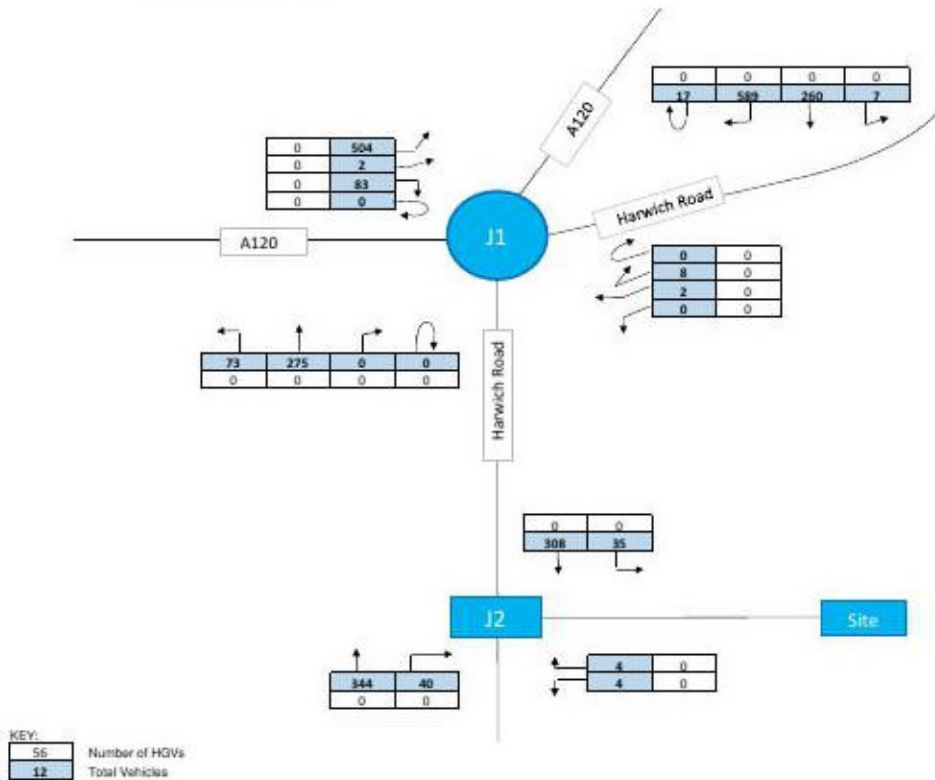
17:00-18:00 PM PEAK HOUR



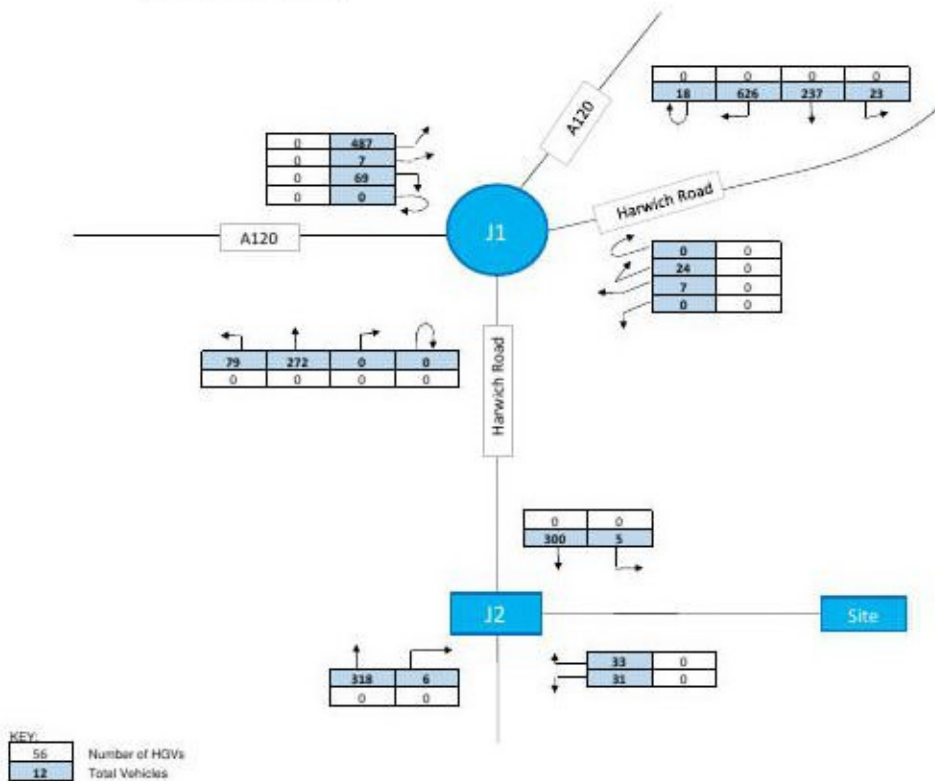
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Drawing Title: BASE 2028 + DEVELOPMENT TRAFFIC FLOWS		Drawing No: TRAFFIC FLOW DIAGRAM 7	Date: Oct-20
Client: BRAND ART LTD		Drawn By: DS	Approved By: JB




08:00-09:00 AM PEAK HOUR



17:00-18:00 PM PEAK HOUR



IT PROJECT: ALDER PARK, HARWICH ROAD, LITTLE BENTLEY, COLCHESTER	Rev: Description: Date:	 Intermodal TRANSPORTATION Harwich Road Little Bentley Colchester Essex CB3 0AB
Drawing Title: BASE 2031 + DEVELOPMENT TRAFFIC FLOWS	Drawing No: TRAFFIC FLOW DIAGRAM 8	Date: Oct-20
Client: BRAND ART LTD	Drawn By: DS	Approved By: JB

APPENDIX F

JUNCTION ASSESSMENT RESULTS

Junctions 8							
PICADY 8 - Priority Intersection Module							
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2021							
For sales and distribution information, program advice and maintenance, contact TRL: [REDACTED]							
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution							

Filename: Site Acces - Harwich Road.arc8

Path: P:\IT 2190 - 2199\IT 2199 Clip Hedge Lane\Calcs & Drawings\Junctions 8\Junction 2

Report generation date: 21/05/2021 10:36:13

» (Default Analysis Set) - Base 2031 + Development, AM

» (Default Analysis Set) - Base 2031 + Development, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
A1 - Base 2031 + Development								
Stream B-AC	0.02	7.84	0.02	A	0.17	8.90	0.15	A
Stream C-AB	0.18	5.24	0.09	A	0.01	4.98	0.01	A
Stream C-A	-	-	-	-	-	-	-	-
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

*D1 - Base 2031 + Development, AM * model duration: 07:45 - 09:15

D2 - Base 2031 + Development, PM model duration: 16:45 - 18:15

Run using Junctions 8.0.6.541 at 21/05/2021 10:36:12

File summary

Title	Site Access - Harwich Road Priority Junction
Location	Clip Hedge Farm
Site Number	Junction 2
Date	05/11/2020
Version	
Status	(new file)
Identifier	
Client	Brand Art
Jobnumber	IT2199
Enumerator	DShrivastava
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2031 + Development, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2031 + Development, AM	Base 2031 + Development	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	5.55	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Harwich Road North		Major
B	B	Site Access		Minor
C	C	Harwich Road South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.25		0.00		2.20	107.00	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.01										34	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	513.725	0.088	0.224	0.141	0.319
1	B-C	656.069	0.095	0.240	-	-
1	C-B	635.928	0.233	0.233	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	289.00	100.000
B	ONE HOUR	✓	8.00	100.000
C	ONE HOUR	✓	323.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

	To			
		A	B	C
From	A	0.000	35.000	254.000
	B	4.000	0.000	4.000
	C	284.000	39.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

	To			
		A	B	C
From	A	0.00	0.12	0.88
	B	0.50	0.00	0.50
	C	0.88	0.12	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

	To			
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

	To			
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.02	7.84	0.02	A
C-AB	0.09	5.24	0.18	A
C-A	-	-	-	-
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (07:45-08:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	6.02	5.97	0.00	503.03	0.012	0.01	7.242	A
C-AB	40.85	40.49	0.00	727.73	0.056	0.09	5.238	A
C-A	202.32	202.32	0.00	-	-	-	-	-
A-B	26.35	26.35	0.00	-	-	-	-	-
A-C	191.22	191.22	0.00	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	7.19	7.18	0.00	488.40	0.015	0.01	7.480	A
C-AB	52.03	51.90	0.00	746.15	0.070	0.12	5.188	A
C-A	238.34	238.34	0.00	-	-	-	-	-
A-B	31.46	31.46	0.00	-	-	-	-	-
A-C	228.34	228.34	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	8.81	8.79	0.00	468.01	0.019	0.02	7.839	A
C-AB	71.62	71.40	0.00	776.06	0.092	0.18	5.111	A
C-A	284.01	284.01	0.00	-	-	-	-	-
A-B	38.54	38.54	0.00	-	-	-	-	-
A-C	279.66	279.66	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	8.81	8.81	0.00	467.98	0.019	0.02	7.840	A
C-AB	71.69	71.68	0.00	776.15	0.092	0.18	5.116	A
C-A	283.94	283.94	0.00	-	-	-	-	-
A-B	38.54	38.54	0.00	-	-	-	-	-
A-C	279.66	279.66	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	7.19	7.21	0.00	488.34	0.015	0.02	7.484	A
C-AB	52.11	52.33	0.00	746.27	0.070	0.12	5.193	A
C-A	238.26	238.26	0.00	-	-	-	-	-
A-B	31.46	31.46	0.00	-	-	-	-	-
A-C	228.34	228.34	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	6.02	6.03	0.00	502.94	0.012	0.01	7.244	A
C-AB	40.98	41.11	0.00	727.84	0.056	0.09	5.244	A
C-A	202.19	202.19	0.00	-	-	-	-	-
A-B	26.35	26.35	0.00	-	-	-	-	-
A-C	191.22	191.22	0.00	-	-	-	-	-

(Default Analysis Set) - Base 2031 + Development, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2031 + Development, PM	Base 2031 + Development	PM		ONE HOUR	16:45	18:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	8.49	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Harwich Road North		Major
B	B	Site Access		Minor
C	C	Harwich Road South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.25		0.00		2.20	107.00	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.01										34	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	513.725	0.088	0.224	0.141	0.319
1	B-C	656.069	0.095	0.240	-	-
1	C-B	635.928	0.233	0.233	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	269.00	100.000
B	ONE HOUR	✓	64.00	100.000
C	ONE HOUR	✓	285.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

	To			
		A	B	C
From	A	0.000	5.000	264.000
	B	33.000	0.000	31.000
	C	280.000	5.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

	To			
		A	B	C
From	A	0.00	0.02	0.98
	B	0.52	0.00	0.48
	C	0.98	0.02	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

	To			
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

	To			
	A	B	C	
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.15	8.90	0.17	A
C-AB	0.01	4.98	0.01	A
C-A	-	-	-	-
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (16:45-17:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	48.18	47.77	0.00	506.65	0.095	0.10	7.838	A
C-AB	5.21	5.18	0.00	728.87	0.007	0.01	4.974	A
C-A	209.36	209.36	0.00	-	-	-	-	-
A-B	3.76	3.76	0.00	-	-	-	-	-
A-C	198.75	198.75	0.00	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	57.53	57.43	0.00	493.33	0.117	0.13	8.257	A
C-AB	6.62	6.61	0.00	747.38	0.009	0.01	4.859	A
C-A	249.59	249.59	0.00	-	-	-	-	-
A-B	4.49	4.49	0.00	-	-	-	-	-
A-C	237.33	237.33	0.00	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	70.47	70.30	0.00	474.78	0.148	0.17	8.896	A
C-AB	8.81	8.79	0.00	772.96	0.011	0.01	4.710	A
C-A	304.98	304.98	0.00	-	-	-	-	-
A-B	5.51	5.51	0.00	-	-	-	-	-
A-C	290.67	290.67	0.00	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	70.47	70.46	0.00	474.78	0.148	0.17	8.903	A
C-AB	8.81	8.81	0.00	772.96	0.011	0.01	4.712	A
C-A	304.98	304.98	0.00	-	-	-	-	-
A-B	5.51	5.51	0.00	-	-	-	-	-
A-C	290.67	290.67	0.00	-	-	-	-	-

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	57.53	57.69	0.00	493.33	0.117	0.13	8.266	A
C-AB	6.62	6.63	0.00	747.38	0.009	0.01	4.861	A
C-A	249.59	249.59	0.00	-	-	-	-	-
A-B	4.49	4.49	0.00	-	-	-	-	-
A-C	237.33	237.33	0.00	-	-	-	-	-

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	48.18	48.29	0.00	506.64	0.095	0.11	7.855	A
C-AB	5.22	5.22	0.00	728.88	0.007	0.01	4.976	A
C-A	209.35	209.35	0.00	-	-	-	-	-
A-B	3.76	3.76	0.00	-	-	-	-	-
A-C	198.75	198.75	0.00	-	-	-	-	-

Junctions 8			
ARCADY 8 - Roundabout Module			
Version: 8.0.6.541 [19821,26/11/2015] © Copyright TRL Limited, 2021			
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Filename: A120 - Harwich Road.arc8

Path: P:\IT 2190 - 2199\IT 2199 Clip Hedge Lane\Calcs & Drawings\Junctions 8\Junction 1

Report generation date: 21/05/2021 10:41:57

- » (Default Analysis Set) - Base 2031, AM
- » (Default Analysis Set) - Base 2031, PM
- » (Default Analysis Set) - Base 2031 + Development, AM
- » (Default Analysis Set) - Base 2031 + Development, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
A1 - Base 2031								
Arm 1	0.72	2.78	0.42	A	0.80	2.91	0.44	A
Arm 2	0.09	4.31	0.09	A	0.09	4.44	0.09	A
Arm 3	0.57	6.61	0.36	A	0.58	6.81	0.37	A
Arm 4	0.51	2.86	0.34	A	0.48	2.81	0.32	A
A1 - Base 2031 + Development								
Arm 1	0.76	2.87	0.43	A	0.81	2.93	0.45	A
Arm 2	0.10	4.41	0.09	A	0.10	4.45	0.09	A
Arm 3	0.59	6.73	0.37	A	0.69	7.31	0.41	A
Arm 4	0.52	2.92	0.34	A	0.49	2.85	0.33	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

*D1 - Base 2031, AM * model duration: 07:45 - 09:15

D2 - Base 2031, PM model duration: 16:45 - 18:15

D3 - Base 2031 + Development, AM model duration: 07:45 - 09:15

D4 - Base 2031 + Development, PM model duration: 16:45 - 18:15

Run using Junctions 8.0.6.541 at 21/05/2021 10:41:55

File summary

Title	A120 - Harwich Road Roundabout
Location	Clip Hdge Farm
Site Number	Junction 1
Date	05/11/2020
Version	
Status	(new file)
Identifier	
Client	Brand Art
Jobnumber	IT2199
Enumerator	DShrivastava
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2031, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2031, AM	Base 2031	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4			3.48	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A120 North	
2	2	Harwich Road North	
3	3	Harwich Road South	
4	4	A120 South	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	7.50	9.70	7.00	18.30	64.00	64.80	
2	4.00	4.70	8.40	28.00	64.00	37.10	
3	4.00	4.50	4.30	20.00	64.00	64.00	
4	7.20	8.60	4.50	16.00	64.00	64.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.600	2278.466
2		(calculated)	(calculated)	0.477	1364.735
3		(calculated)	(calculated)	0.417	1166.397
4		(calculated)	(calculated)	0.566	2082.439

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	847.00	100.000
2	ONE HOUR	✓	71.00	100.000
3	ONE HOUR	✓	283.00	100.000
4	ONE HOUR	✓	581.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	17.000	48.000	193.000	589.000
	2	56.000	0.000	0.000	15.000
	3	224.000	0.000	0.000	59.000
	4	504.000	15.000	62.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	0.02	0.06	0.23	0.70
	2	0.79	0.00	0.00	0.21
	3	0.79	0.00	0.00	0.21
	4	0.87	0.03	0.11	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	1.000	1.000	1.000	1.000
	2	1.000	1.000	1.000	1.000
	3	1.000	1.000	1.000	1.000
	4	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.42	2.78	0.72	A
2	0.09	4.31	0.09	A
3	0.36	6.61	0.57	A
4	0.34	2.86	0.51	A

Main Results for each time segment

Main results: (07:45-08:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	637.67	636.08	57.82	0.00	2243.79	0.284	0.40	2.237	A
2	53.45	53.24	646.59	0.00	1056.58	0.051	0.05	3.587	A
3	213.06	211.92	508.34	0.00	954.67	0.223	0.29	4.840	A
4	437.41	436.26	222.49	0.00	1956.53	0.224	0.29	2.367	A

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	761.44	760.96	69.18	0.00	2236.98	0.340	0.51	2.439	A
2	63.83	63.77	773.54	0.00	996.08	0.064	0.07	3.861	A
3	254.41	254.02	608.21	0.00	913.07	0.279	0.38	5.458	A
4	522.31	521.98	266.63	0.00	1931.56	0.270	0.37	2.554	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	932.56	931.75	84.71	0.00	2227.66	0.419	0.72	2.776	A
2	78.17	78.07	947.16	0.00	913.34	0.086	0.09	4.310	A
3	311.59	310.86	744.71	0.00	856.22	0.364	0.57	6.593	A
4	639.69	639.15	326.33	0.00	1897.78	0.337	0.51	2.858	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	932.56	932.56	84.78	0.00	2227.62	0.419	0.72	2.779	A
2	78.17	78.17	947.97	0.00	912.95	0.086	0.09	4.312	A
3	311.59	311.58	745.38	0.00	855.94	0.364	0.57	6.612	A
4	639.69	639.69	326.99	0.00	1897.40	0.337	0.51	2.861	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	761.44	762.24	69.29	0.00	2236.91	0.340	0.52	2.442	A
2	63.83	63.93	774.83	0.00	995.46	0.064	0.07	3.866	A
3	254.41	255.13	609.28	0.00	912.63	0.279	0.39	5.480	A
4	522.31	522.85	267.66	0.00	1930.98	0.270	0.37	2.557	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	637.67	638.14	58.01	0.00	2243.67	0.284	0.40	2.244	A
2	53.45	53.51	648.69	0.00	1055.58	0.051	0.05	3.594	A
3	213.06	213.46	510.08	0.00	953.94	0.223	0.29	4.865	A
4	437.41	437.74	223.97	0.00	1955.70	0.224	0.29	2.373	A

(Default Analysis Set) - Base 2031, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2031, PM	Base 2031	PM		ONE HOUR	16:45	18:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4			3.54	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A120 North	
2	2	Harwich Road North	
3	3	Harwich Road South	
4	4	A120 South	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	7.50	9.70	7.00	18.30	64.00	64.80	
2	4.00	4.70	8.40	28.00	64.00	37.10	
3	4.00	4.50	4.30	20.00	64.00	64.00	
4	7.20	8.60	4.50	16.00	64.00	64.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.600	2278.466
2		(calculated)	(calculated)	0.477	1364.735
3		(calculated)	(calculated)	0.417	1166.397
4		(calculated)	(calculated)	0.566	2082.439

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	900.00	100.000
2	ONE HOUR	✓	70.00	100.000
3	ONE HOUR	✓	280.00	100.000
4	ONE HOUR	✓	561.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	18.000	51.000	205.000	626.000
	2	54.000	0.000	0.000	16.000
	3	217.000	0.000	0.000	63.000
	4	487.000	15.000	59.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	0.02	0.06	0.23	0.70
	2	0.77	0.00	0.00	0.23
	3	0.78	0.00	0.00	0.23
	4	0.87	0.03	0.11	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	1.000	1.000	1.005	1.003
	2	1.000	1.000	1.000	1.000
	3	1.005	1.000	1.000	1.000
	4	1.004	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	0.0	0.0	0.5	0.3
	2	0.0	0.0	0.0	0.0
	3	0.5	0.0	0.0	0.0
	4	0.4	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.44	2.91	0.80	A
2	0.09	4.44	0.09	A
3	0.37	6.81	0.58	A
4	0.32	2.81	0.48	A

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	677.57	675.84	55.57	0.00	2245.14	0.302	0.43	2.300	A
2	52.70	52.49	681.84	0.00	1039.78	0.051	0.05	3.646	A
3	210.80	209.65	536.09	0.00	943.11	0.224	0.29	4.921	A
4	422.35	421.25	216.49	0.00	1959.93	0.215	0.27	2.347	A

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	809.08	808.55	66.48	0.00	2238.59	0.361	0.57	2.526	A
2	62.93	62.87	815.74	0.00	975.97	0.064	0.07	3.942	A
3	251.71	251.31	641.43	0.00	899.24	0.280	0.39	5.574	A
4	504.33	504.02	259.44	0.00	1935.63	0.261	0.35	2.523	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	990.92	989.99	81.41	0.00	2229.64	0.444	0.80	2.912	A
2	77.07	76.97	998.80	0.00	888.73	0.087	0.09	4.435	A
3	308.29	307.53	785.36	0.00	839.29	0.367	0.58	6.786	A
4	617.67	617.16	317.51	0.00	1902.77	0.325	0.48	2.808	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	990.92	990.91	81.47	0.00	2229.60	0.444	0.80	2.915	A
2	77.07	77.07	999.72	0.00	888.29	0.087	0.09	4.437	A
3	308.29	308.27	786.12	0.00	838.97	0.367	0.58	6.809	A
4	617.67	617.67	318.18	0.00	1902.39	0.325	0.48	2.811	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	809.08	810.00	66.59	0.00	2238.53	0.361	0.57	2.529	A
2	62.93	63.03	817.19	0.00	975.28	0.065	0.07	3.948	A
3	251.71	252.46	642.63	0.00	898.73	0.280	0.39	5.599	A
4	504.33	504.83	260.48	0.00	1935.04	0.261	0.36	2.528	A

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	677.57	678.11	55.75	0.00	2245.03	0.302	0.44	2.307	A
2	52.70	52.76	684.13	0.00	1038.69	0.051	0.05	3.653	A
3	210.80	211.21	537.99	0.00	942.32	0.224	0.29	4.945	A
4	422.35	422.66	217.95	0.00	1959.10	0.216	0.28	2.353	A

(Default Analysis Set) - Base 2031 + Development, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2031 + Development, AM	Base 2031 + Development	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4			3.56	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A120 North	
2	2	Harwich Road North	
3	3	Harwich Road South	
4	4	A120 South	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	7.50	9.70	7.00	18.30	64.00	64.80	
2	4.00	4.70	8.40	28.00	64.00	37.10	
3	4.00	4.50	4.30	20.00	64.00	64.00	
4	7.20	8.60	4.50	16.00	64.00	64.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.600	2278.466
2		(calculated)	(calculated)	0.477	1364.735
3		(calculated)	(calculated)	0.417	1166.397
4		(calculated)	(calculated)	0.566	2082.439

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	873.00	100.000
2	ONE HOUR	✓	71.00	100.000
3	ONE HOUR	✓	288.00	100.000
4	ONE HOUR	✓	589.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	17.000	48.000	219.000	589.000
	2	56.000	0.000	0.000	15.000
	3	228.000	0.000	0.000	60.000
	4	504.000	15.000	70.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	0.02	0.05	0.25	0.67
	2	0.79	0.00	0.00	0.21
	3	0.79	0.00	0.00	0.21
	4	0.86	0.03	0.12	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	1.000	1.000	1.005	1.007
	2	1.000	1.000	1.000	1.000
	3	1.005	1.000	1.000	1.017
	4	1.008	1.066	1.016	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	0.0	0.0	0.5	0.7
	2	0.0	0.0	0.0	0.0
	3	0.5	0.0	0.0	1.7
	4	0.8	6.6	1.6	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.43	2.87	0.76	A
2	0.09	4.41	0.10	A
3	0.37	6.73	0.59	A
4	0.34	2.92	0.52	A

Main Results for each time segment

Main results: (07:45-08:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	657.24	655.58	63.82	0.00	2240.19	0.293	0.42	2.284	A
2	53.45	53.24	672.09	0.00	1044.43	0.051	0.05	3.631	A
3	216.82	215.65	508.31	0.00	954.68	0.227	0.29	4.897	A
4	443.43	442.25	225.48	0.00	1954.85	0.227	0.30	2.405	A

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	784.81	784.30	76.36	0.00	2232.67	0.352	0.54	2.500	A
2	63.83	63.77	804.07	0.00	981.53	0.065	0.07	3.922	A
3	258.91	258.50	608.19	0.00	913.08	0.284	0.40	5.535	A
4	529.50	529.16	270.21	0.00	1929.53	0.274	0.38	2.597	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	961.19	960.31	93.50	0.00	2222.39	0.433	0.76	2.868	A
2	78.17	78.07	984.52	0.00	895.53	0.087	0.10	4.404	A
3	317.09	316.33	744.68	0.00	856.23	0.370	0.59	6.705	A
4	648.50	647.93	330.71	0.00	1895.30	0.342	0.52	2.914	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	961.19	961.18	93.59	0.00	2222.34	0.433	0.76	2.871	A
2	78.17	78.17	985.40	0.00	895.11	0.087	0.10	4.406	A
3	317.09	317.08	745.38	0.00	855.94	0.370	0.59	6.727	A
4	648.50	648.50	331.39	0.00	1894.91	0.342	0.52	2.917	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	784.81	785.68	76.49	0.00	2232.59	0.352	0.55	2.504	A
2	63.83	63.93	805.47	0.00	980.86	0.065	0.07	3.926	A
3	258.91	259.65	609.31	0.00	912.61	0.284	0.40	5.560	A
4	529.50	530.06	271.28	0.00	1928.93	0.275	0.38	2.602	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	657.24	657.75	64.04	0.00	2240.06	0.293	0.42	2.289	A
2	53.45	53.52	674.33	0.00	1043.36	0.051	0.05	3.636	A
3	216.82	217.24	510.10	0.00	953.93	0.227	0.30	4.925	A
4	443.43	443.77	227.00	0.00	1953.99	0.227	0.30	2.408	A

(Default Analysis Set) - Base 2031 + Development, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2031 + Development, PM	Base 2031 + Development	PM		ONE HOUR	16:45	18:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4			3.70	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A120 North	
2	2	Harwich Road North	
3	3	Harwich Road South	
4	4	A120 South	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	7.50	9.70	7.00	18.30	64.00	64.80	
2	4.00	4.70	8.40	28.00	64.00	37.10	
3	4.00	4.50	4.30	20.00	64.00	64.00	
4	7.20	8.60	4.50	16.00	64.00	64.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.600	2278.466
2		(calculated)	(calculated)	0.477	1364.735
3		(calculated)	(calculated)	0.417	1166.397
4		(calculated)	(calculated)	0.566	2082.439

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	903.00	100.000
2	ONE HOUR	✓	70.00	100.000
3	ONE HOUR	✓	313.00	100.000
4	ONE HOUR	✓	563.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	18.000	51.000	208.000	626.000
	2	54.000	0.000	0.000	16.000
	3	242.000	0.000	0.000	71.000
	4	487.000	15.000	61.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	0.02	0.06	0.23	0.69
	2	0.77	0.00	0.00	0.23
	3	0.77	0.00	0.00	0.23
	4	0.87	0.03	0.11	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	1.000	1.000	1.005	1.003
	2	1.000	1.000	1.000	1.000
	3	1.005	1.000	1.000	1.000
	4	1.004	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
From		1	2	3	4
	1	0.0	0.0	0.5	0.3
	2	0.0	0.0	0.0	0.0
	3	0.5	0.0	0.0	0.0
	4	0.4	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.45	2.93	0.81	A
2	0.09	4.45	0.10	A
3	0.41	7.31	0.69	A
4	0.33	2.85	0.49	A

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	679.83	678.09	57.07	0.00	2244.24	0.303	0.43	2.304	A
2	52.70	52.49	685.59	0.00	1037.99	0.051	0.05	3.652	A
3	235.64	234.32	536.08	0.00	943.11	0.250	0.33	5.089	A
4	423.86	422.74	235.17	0.00	1949.36	0.217	0.28	2.365	A

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	811.78	811.24	68.28	0.00	2237.52	0.363	0.57	2.532	A
2	62.93	62.87	820.23	0.00	973.83	0.065	0.07	3.951	A
3	281.38	280.90	641.43	0.00	899.24	0.313	0.45	5.839	A
4	506.13	505.81	281.85	0.00	1922.95	0.263	0.36	2.549	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	994.22	993.28	83.61	0.00	2228.32	0.446	0.80	2.923	A
2	77.07	76.97	1004.29	0.00	886.11	0.087	0.09	4.449	A
3	344.62	343.67	785.35	0.00	839.29	0.411	0.69	7.279	A
4	619.87	619.35	344.89	0.00	1887.27	0.328	0.49	2.847	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	994.22	994.21	83.68	0.00	2228.28	0.446	0.81	2.926	A
2	77.07	77.07	1005.22	0.00	885.67	0.087	0.10	4.451	A
3	344.62	344.60	786.12	0.00	838.97	0.411	0.69	7.309	A
4	619.87	619.87	345.70	0.00	1886.81	0.329	0.49	2.850	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	811.78	812.71	68.39	0.00	2237.45	0.363	0.57	2.536	A
2	62.93	63.03	821.70	0.00	973.13	0.065	0.07	3.957	A
3	281.38	282.31	642.64	0.00	898.73	0.313	0.46	5.870	A
4	506.13	506.64	283.10	0.00	1922.24	0.263	0.36	2.552	A

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	679.83	680.37	57.26	0.00	2244.13	0.303	0.44	2.310	A
2	52.70	52.76	687.90	0.00	1036.89	0.051	0.05	3.657	A
3	235.64	236.14	537.99	0.00	942.32	0.250	0.34	5.122	A
4	423.86	424.18	236.84	0.00	1948.42	0.218	0.28	2.372	A